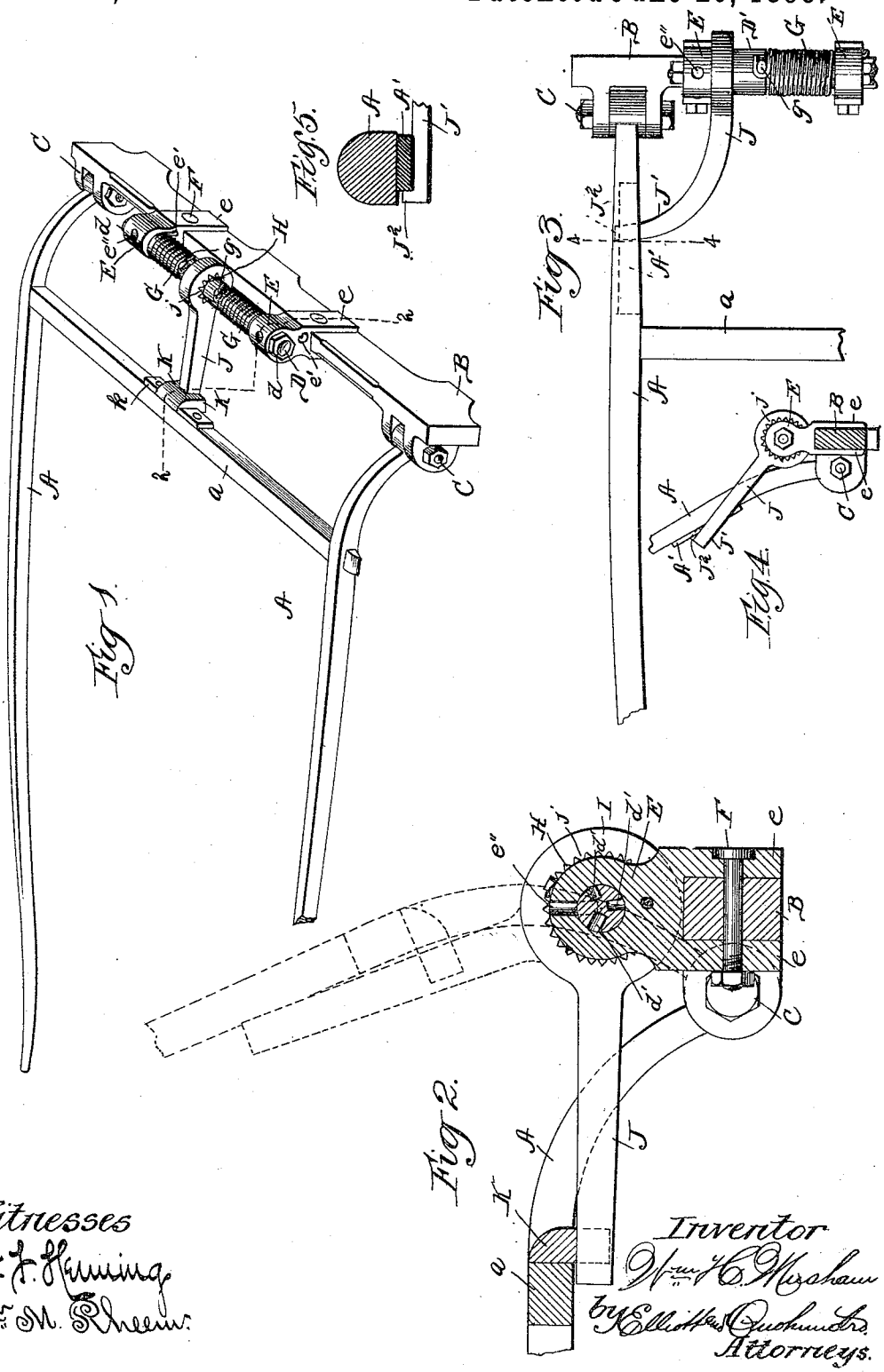
(No Model.)

W. H. MUSHAM.

THILL SUPPORT.

No. 499,846. Patented June 20, 1893.



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THILL-SUPPORT.

SPECIFICATION forming part of Letters Patent No. 499,846, dated June 20, 1893.

Application filed September 22, 1892. Serial No. 446,539. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. MUSHAM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Shaft-Holders, of which the following is a full, clear, and exact specification.

My invention relates to devices for holding the shafts of vehicles in an elevated position when not in use, and my improvements are not only designed to accomplish this object, but to accurately balance the shafts at any elevation or inclination at which they may be placed.

The object of my invention, therefore, is to provide improved means for counterbalancing the weight of the shafts when they are at any position or angle of inclination at which they may be placed.

The advantages of a device of this character are, obviously, manifold; it not only holds the shafts up out of the way, safe from injury and maintains them in readiness to be placed in position on the horse with the maximum degree of rapidity, a feature of the utmost importance in fire departments, but it completely relieves the horse of the weight of the shafts, and where the animal is afflicted with saddle-gall this feature of my invention will readily commend itself, as the shafts may be placed at such an elevation as to be entirely independent of any support from the animal or the harness.

With the above named objects in view, my invention consists in certain features of novelty in the construction, combination and arrangement of parts by which the said objects and certain other objects hereinafter described are attained, as further explained with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1, is a perspective view illustrating a pair of shafts with my invention applied thereto. Fig. 2, is an enlarged sectional view taken on the line 2, 2, Fig. 1, showing the shafts in their uppermost position, in dotted lines. Fig. 3, is a plan view of a modified form of my invention, applicable to buggies or light vehicles. Fig. 4, is a side elevation of the same, showing the shafts in their uppermost position, and Fig. 5, is an enlarged detail sectional view taken on the line 4, 4, Fig. 3.

Like signs of reference indicate like parts throughout the several views.

My invention comprises a spring actuated arm or lever, which is pivotally mounted on the forward axle, or some other suitable part of the running gear, in such a position that its free end will support the shafts, and its pivotal point or fulcrum, will be eccentric to the axes of the hinges or thill couplings, which connect the shafts to the vehicle. By such an arrangement as this, it will be seen that when the shafts are in their lower-most position and the spring is necessarily at its greatest tension, the shafts will bear upon the arm or lever farthest from its pivotal point, and such increased tension of the spring will, consequently, be counterbalanced, or off-set by the increase in the distance between the weight (the shafts) and the fulcrum or pivotal point of the lever. On the other hand, when the shafts are raised to their upper-most position, and the spring is necessarily at its minimum tension, they will impinge the lever nearest its fulcrum or pivot, by reason of the eccentric arrangement of the pivots of the shafts and lever, and, consequently, the decrease in the tension of the spring will be compensated for by the shortening of the weight supporting arm of the lever, that is to say, by the decrease in the distance between the fulcrum and the bearing point of the shafts.

My invention also comprises a construction or arrangement in which the decrease of the spring tension is compensated for by the lever or arm seeking a bearing under the shafts at a farther point from their hinges or thill couplings.

Referring more particularly to Figs. 1 and 2 of the drawings, A, are the shafts, which may be connected or hinged to the forward axle B, or other part of the running gear, by means of the thill-couplings C, as usual.

Journaled preferably above the axle B, or any other suitable part of the running gear, is a short shaft D. This shaft D, is eccentric to the axes of the thill-couplings, and is preferably mounted at each end in a box or bearing E, which boxes or bearings E, may be se-

cured to the portion D, in any suitable manner, as by means of transverse bolts F, passing through depending ears *e*, formed on, or otherwise secured to the boxes E, the shaft D being held against end-wise displacement by means of suitable nuts or heads *d*. I provide this shaft D, with a spring, whose normal tendency is to turn or rotate it away from the shafts. A convenient and efficient arrangement, consists in coiling upon each end of the shaft, a stout spring G, and providing the shaft with two lugs *g*, over which one end of each of such springs engages, the other ends of such springs being secured in any suitable way to some stationary part, such, for instance, as the boxes E, through perforations *e'*, in which they may be passed, as shown.

I employ two springs for the sake of greater power, and when two are employed, I form on, or secure to the shaft at some suitable point between them, a series of teeth or notches H, over which fits a hub I of the supporting arm or lever J, which hub likewise is provided with complementary or corresponding teeth or notches *j*, which engage with the teeth or notches H, the object of such teeth or notches being simply to provide an adjustable connection between the shaft D and the supporting lever J; whereby the latter may be turned irrespective of the lever, for varying the tension of the springs G. To this end, also, I provide means for holding the shaft D against rotation, while the lever is slipped sidewise out of engagement with the teeth H on the shaft, so that the lever may be caused to take a new hold on the shaft, and thus, utilized for winding up the springs. A convenient means of accomplishing this, consists in providing the ends of the shaft D, where they pass through the boxes E, with a number of sockets *d'*, and each of the boxes themselves, with a perforation *e''*, through which a pin (not shown) may be dropped into any one of the sockets *d'*, for locking the shaft. When the shaft is thus locked, the lever J may be released from the teeth thereof, by moving it to one side, and it may then be turned upward and again slipped back into engagement with the shaft, and after the pin is withdrawn, utilized as a lever for winding up the springs and bring another one of the sockets *d'* into register with the perforation *e''*, whereupon, if need be, the shaft may be again locked by the pin, and the operation repeated until the tension of the springs is sufficient. I prefer to employ these sockets *d'*, and perforations *e''*, at both ends of the shaft, for the reason that a single pin cannot be made of sufficient diameter to resist the tension of the springs, without making the boxes E and shaft D objectionably large; but it will, of course, be understood, that where the weight of the shafts will permit, a shaft with the sockets in but one end, is within the scope of my invention.

As a means for holding the arm or lever J in place on the teeth H of the shaft D, I provide the single-tree bar *a*, or any other suitable part of the shafts, with two depending lugs or ears, K, which may be formed on a plate *k*, secured to the bar *a*. The lever or arm J, when in operation, is arranged between the lugs K, and is held in such position by the constant tension of the springs; and the portion of the plate *k* under which the lever J bears, serves as a rub-plate or guard, for relieving the bar *a* of the wear which would be caused by the friction of the lever.

It will now be readily understood, that the lever J will move in unison with and exert a normal pressure under the shafts throughout their entire movement and that this pressure may be so regulated by varying the tension of the springs G, as to automatically and exactly counter-balance the shafts in any position in which they may be placed; and as the shafts change their angle of inclination, their bearing point upon the lever J will also change, with relation to the fulcrum or pivot of such lever, and in this way, compensate for or counterbalance the variation in the tension of the springs, caused by the oscillation of the lever. In other words, when the shafts are in their uppermost position, as shown in dotted lines, in Fig. 2, and the springs are necessarily at their minimum tension, the bearing point of the shafts on the lever J, will be nearest the fulcrum or pivot of the lever and consequently, the springs, with their decrease of tension, will be capable of exerting as much power or pressure under the shafts as they are capable of exerting when the bearing point of the shafts or plate *k*, is at the farther end of the lever, and as the bearing point between the shafts and the lever shifts or changes automatically, with the variation in the tension of the spring, caused by the oscillation of the lever, it follows that the shafts will be exactly counterbalanced also at any position intermediate of those shown in the drawings.

On light vehicles, or in any other instances where it is not necessary to have a device of great power, the form shown in Figs. 3 to 5, may be employed. This consists of a short shaft D', similar to the shaft D, having one of the springs G coiled thereon, and being mounted in the boxes or bearings E, as described, which latter are secured to the axle B, or other suitable part of the running gear, as explained. The lever J, however, is preferably arranged at one end of the shaft D', instead of at its mid-length, so as to bring it nearer one of the shafts A, and its outer end is provided with a bend J', so turned as to engage under one of the shafts A, and thus support them. The lever J may be secured to the shaft D', in the manner before explained, and in order that it may be held in place thereon, against axial movement, it is arranged against one of the boxes E, and is provided at its extremity with an upturned lug J^2, which engages on the outer side of a

rub-plate A′, secured to the under side of one of the shafts. Thus, the box E holds the lever from axial movement in one direction, while the lug J^2, as long as it is in engagement with the rub-plate A′, holds it against movement in the opposite direction.

In this form of my invention, the principle of operation is substantially the same, but instead of the point of bearing between the shafts and the lever changing with reference to the length of the lever, it changes or shifts with reference to the length of the shafts; that is to say, when the shafts are in their lowermost position, the lever J will take its bearing under the lower or inner end of the rub-plate A′, at the inner extremity of its movement to and from the coupling C, and, consequently, the weight of the shafts will exert sufficient power upon the lever to overcome the increase in the tension of the spring, induced by turning the lever to its lowermost position; and as the shafts rise, the end of the lever J will move away from the coupling C toward the outer or upper end of the rub-plate A′, and thus compensate for the decrease in the tension of the spring, caused by permitting the spring to relax.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The combination with the hinged shafts, of a pivoted lever upon which said shafts normally rest at a point beyond their hinges, a spring supporting said lever and holding it normally and continually against the shafts, said lever being pivoted eccentrically of the shaft hinges; whereby the point of support for the shafts will shift along the lever as the shafts oscillate, substantially as set forth.

2. The combination with the hinged shafts, of a lever for supporting said shafts, a shaft forming the fulcrum of said lever, adjustably connected thereto and being journaled eccentrically with relation to the hinges of said shafts, and a spring holding said lever normally and continually against a part of the shafts at a point forward of their hinges, substantially as set forth.

3. The combination with the shafts, of an arm or lever for supporting said shafts, having a hub provided with teeth or notches, a shaft having teeth or notches fitting in said hub, means for holding said lever against axial movement on said shaft, and a spring for rotating said shaft substantially as set forth.

4. The combination with the shafts, of a shaft having teeth or notches, a spring actuated lever for supporting said shafts, having complementary teeth or notches engaging the said teeth or notches on said shaft, a rub-plate carried by said shafts, and having lugs between which said lever engages, whereby the lever will be held against axial displacement substantially as set forth.

5. The combination with the shafts, of the perforated boxes E, secured to a part of the running gear, a shaft journaled in said boxes and having sockets therein, and being provided with a series of teeth, a spring for rotating said shaft, a lever or arm through which said shaft passes, having complementary teeth engaging the aforesaid teeth, and a rub-plate carried by the shafts and having lugs engaging on either side of said lever for holding the latter against axial displacement substantially as set forth.

6. The combination of the hinged shafts, a rotary shaft, a spring for rotating said shaft in one direction, a lever capable of rotating said shaft in the opposite direction, detachably secured to said shaft and being adapted to support the shafts and means for holding said rotary shafts against rotation while said lever is being detached, substantially as set forth.

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