July 28, 1953 J. J. SLOYAN 2,646,951

SUPPORT FOR MOVABLY MOUNTING MECHANISMS SUCH AS MOTORS

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Fig. 1.

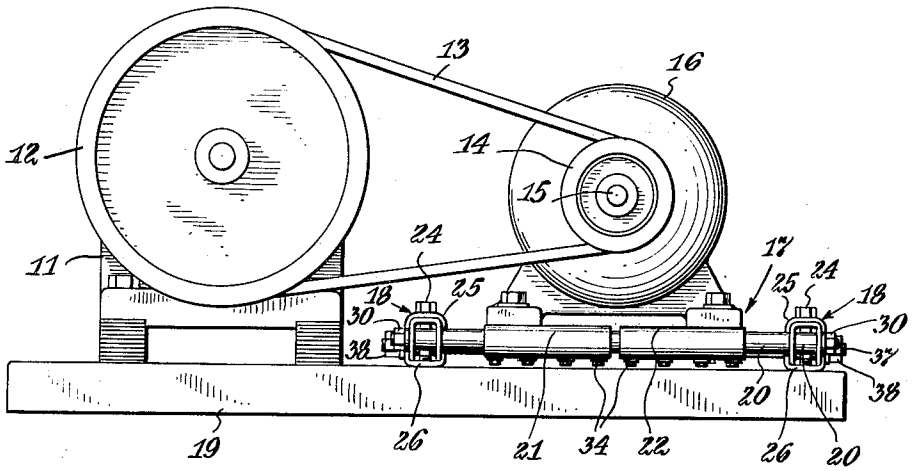


Fig. 2.

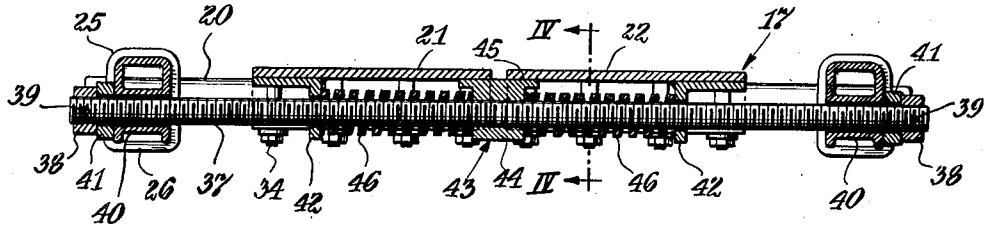


Fig. 3.

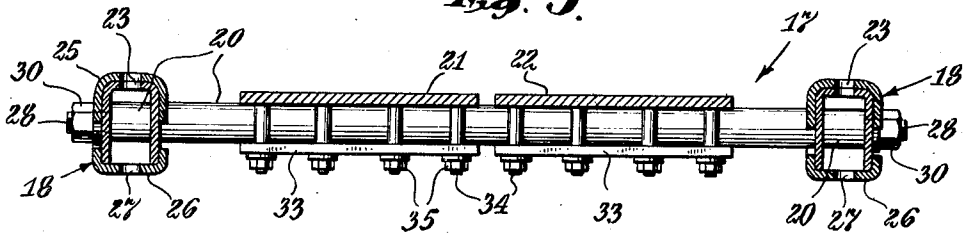
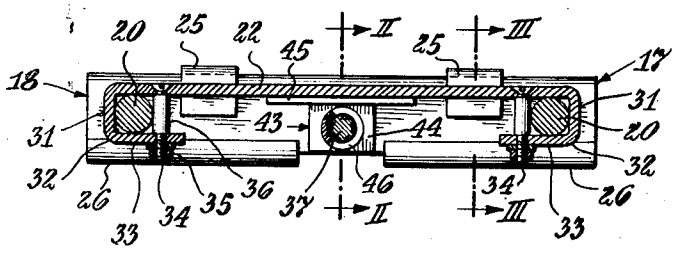


Fig. 4.



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Fig. 5.

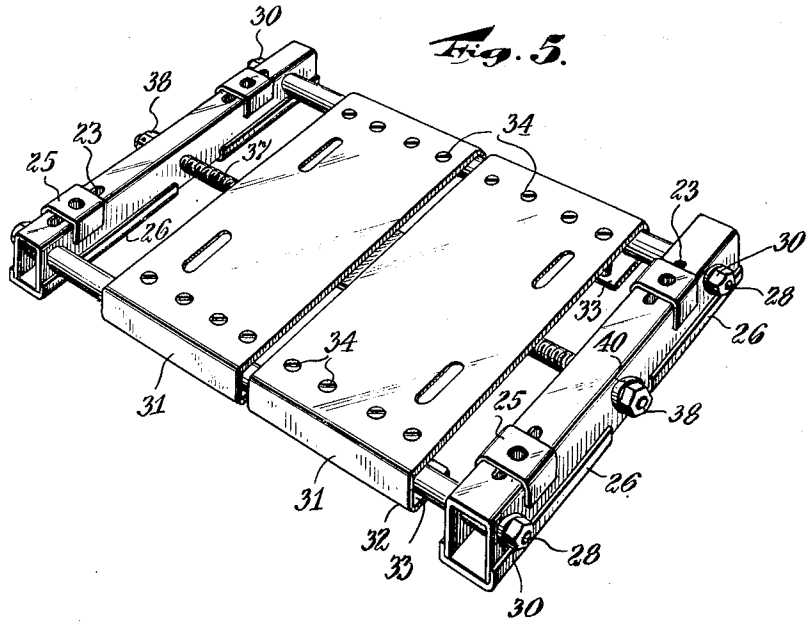
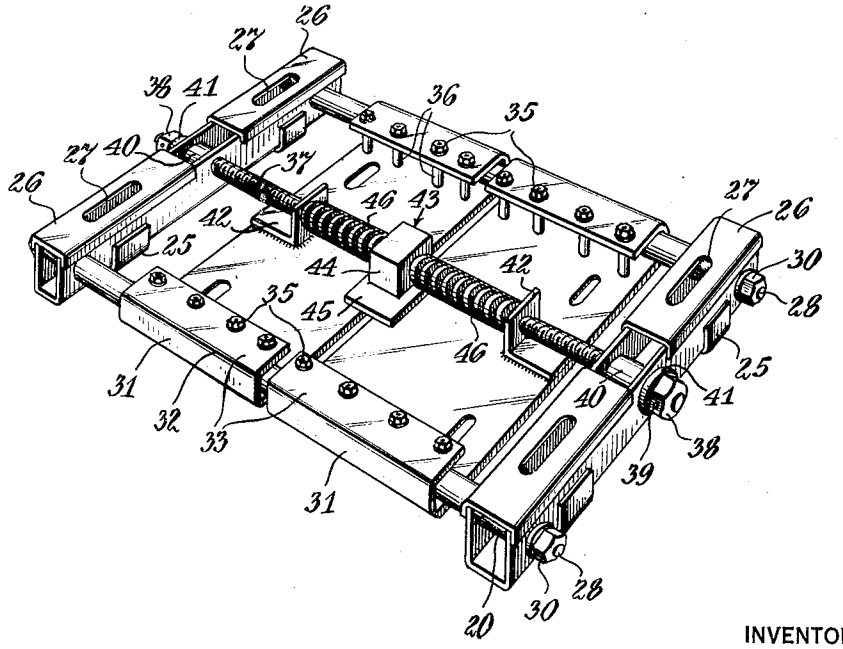


Fig. 6.



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Fig. 7.

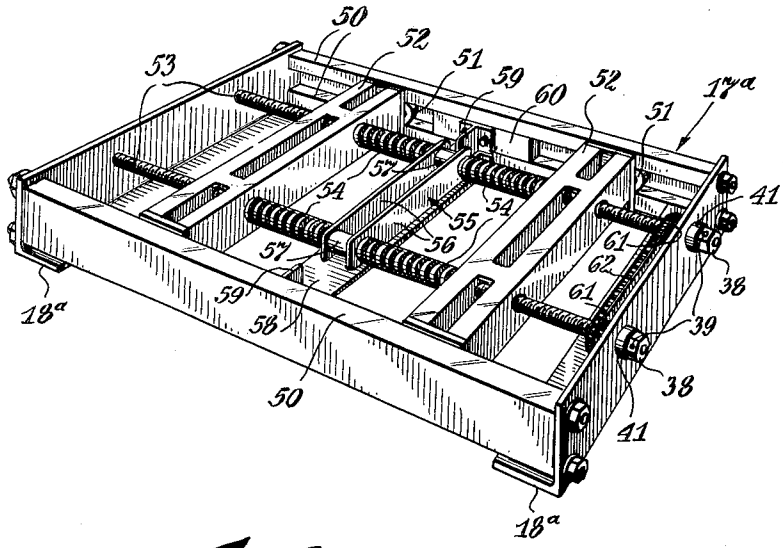
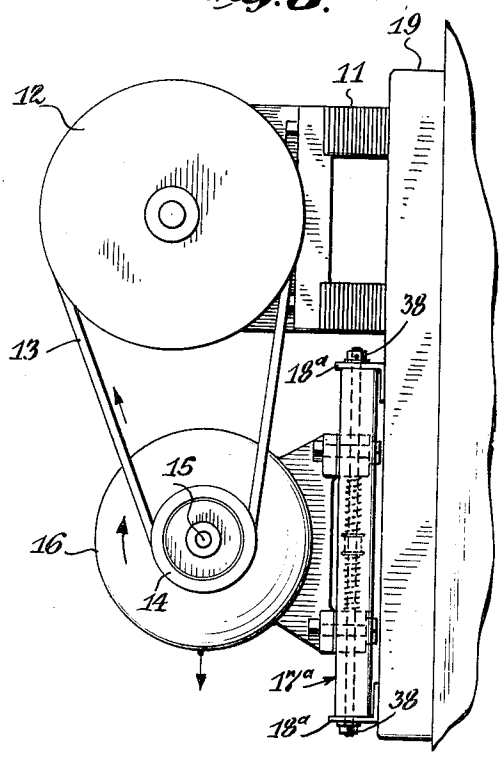


Fig. 8.



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SUPPORT FOR MOVABLY MOUNTING MECHANISMS SUCH AS MOTORS

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7 Claims. (Cl. 248—23)

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This invention relates to supports and more particularly to supports for movably mounting a mechanism, such as a motor, to render said mechanism automatically adjustable with respect to another instrumentality, and is an improvements over prior Patents 2,196,891 and 2,196,892 of April 9, 1940.

For purpose of illustration herein, as in said prior patents, an electric motor has been chosen to represent the movably mounted mechanism and a pump to illustrate the relatively fixed instrumentality, and, merely for clarity of description, will be referred to specifically by those designations, but without restricting the invention thereto.

The objects of the invention are to provide an improved support for a motor or other mechanism in its relation to a relatively fixed pump or other instrumentality; to prevent excessive load or constant strain from disrupting precision of parallelism or alignment of the motor and pump; to adapt the support to use with greater loads or strains than possible with the prior art constructions; to assure constancy of slidable assembly of the movable support sections with the support rails; to utilize spring compression as the load-resisting force; to apply the spring compression in direct opposition to the load and parallel to the rails; to improve the spring-tensioning means; to secure simplicity of construction and operation, and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings in which like numerals of reference indicate similar parts throughout the several views;

Figure 1 is an elevation, for convenience referred to as of the front of a motor mounted on the support of the present invention, in operative association with a pump;

Figures 2 and 3 are longitudinal sections taken on lines II—II and III—III respectively of Fig. 4;

Figure 4 is a cross-section taken on line IV—IV of Fig. 2;

Figures 5 and 6 are perspective views respectively looking toward the top and bottom of the support;

Figure 7 is another perspective view similar to Fig. 5 and showing a modified construction of support; and

Figure 8 is an elevation, similar to Fig. 1 and showing the said modified construction of support.

As in the above-mentioned prior patents, the general organization of the invention as used,

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comprises an instrumentality, such as a pump 11 to be driven which is provided with a driven pulley 12 for a belt 13 extending to a driving pulley 14 on the armature shaft 15 of a motor 16 constituting the specific showing of mechanism for which my improved support is provided. Accordingly the motor is shown mounted upon a support designated generally by reference numeral 17, and it is in that support that the present invention inheres more particularly.

In the specific embodiment of the invention illustrated in said drawings, and more especially Figures 1–6 thereof, support 17 is shown as having a pair of parallel cleats 18 which are bolted or otherwise secured in fixed position on a base 19 or other surface to which the said instrumentality is also fixed. Between these cleats, next the ends thereof, are a pair of parallel rails 20 with the ends of the rails securely held by the cleats, and assembled so that the rails and cleats form a rectangle of which the cleats will arbitrarily be referred to as at the ends and the rails as at the sides of the rectangular assembly. Upon the pair of rails rests a carriage which is shown herein as comprised of two sections 21, 22 each extending cross-wise from one rail to the other and separable in a direction longitudinally of the rails for enabling motors of different base dimensions to be secured thereon. After the motor 16 is secured to the two sections of the carriage, it will be obvious that said sections are rigid with respect to the motor and the motor and said sections will accordingly move as a unit and the two said sections operate in effect as a single carriage for the motor. Adjustable spring tensioning means, extending beneath the carriage, is provided to apply the desired force tending to move the carriage and motor away from the pump or other instrumentality and apply appropriate tension in the driving belt 13, as will be more fully described hereinbelow.

The cleats 18 are preferably alike, so description of one will suffice for both. Likewise the rails are duplicates of each other and construction of opposite ends of each rail is the same and the description of one will not be repeated for the other. Each said cleat comprises an inverted U-channel bar the web whereof is provided with longitudinal slots 23 for passage of bolts 24 at such position as desired lengthwise of the cleat for mounting the cleat rigidly upon the base or other surface 19. In effecting such mounting, the longitudinal edges of the flanges of the channel bar are directed toward the base 19. A flanged washer 25 movable lengthwise of

the cleat may be provided to overlie the slot and underlie the bolt head. Bearing surface for the cleat against the base is enlarged by provision of a sill 26 thereunder, said sill having upturned flanges at the outside of the channel bar flanges so as to retain the latter against spreading. Said sill may conveniently be spot welded to the channel bar and also may be divided so as to be partly at each end portion of the channel bar and unobstructed. Furthermore, the said portions of the sill are shown longitudinally slotted, as at 27 to pass the bolts 24 at the desired position therethrough.

The rail construction preferably comprises parallel cylindrical rods of desired and adequate diameter, each said rod passing through a close fitting hole in the near or inside flange of each channel, said hole providing a means of support for said rod. The ends of each of said rods are reduced and threaded at 28 and the outwardly facing shoulders are adapted to engage the inner faces of the outer channel flanges. A nut 30 on the extremity of the threaded end of the rod clamps the rail to the cleat.

Side marginal portions of the carriage sections 21, 22 rest upon and make line contact with said cylindrical rails said marginal portions beyond the rails being bent at right angles, as at 31, to depend at the outside of said rails and make a second line contact therewith. Said depending portions of the carriage sections are bent again at right angles, as at 32, to underlie the rails and thereby provide retaining lips 33 having a third line contact with the rails directly opposed to the first mentioned line contact. Said lips 33 preferably project inwardly of the rectangular configuration and with sufficient projection past the rails so as to accommodate vertically disposed screws or bolts 34 which will clear the rails at the inner sides thereof and which, by extending from the top body portion of the carriage sections to the said lips 33 therebelow, will prevent the lips from bending away from the rail. Said screws or bolts are shown provided with nuts 35 below the lips and provided with spacing sleeves 36 between said lips and body portion of the carriage. By the means described, therefore, the rails provide an invariable guideway for the carriage which cannot be spread or distorted in use and which maintains the three lines of contact with each rail constantly, thereby preventing any tilt or wobbling of the carriage and yet providing for the desired sliding of the carriage longitudinally of said rails.

The adjustable tensioning means of the present disclosure constitutes an essential characteristic of the invention. As shown, a longitudinally fixed but rotatable threaded member or worm 37 is located beneath the carriage midway between and parallel to said rails. This worm projects through the two cleats at opposite ends of the device, and is shown as having a nut 38 at the outside of each cleat, each said nut and worm having a diametric pin 39 therethrough for fixing the nut on the worm whereby said nuts virtually constitute heads at opposite ends of the worm, and whereby rotation of either nut or head will obtain corresponding rotation of the worm. The worm does not have threaded engagement with the cleat, but can be freely rotated with respect thereto. As indicated, the cleat may be provided with a spacing collar 40 between its flanges and around the worm both to provide bracing strength for the flanges and a bearing surface for the rotational engagement of the worm therethrough. A washer 41 is shown interposed between the outer flange and the nut or head 38 to distribute the pressure and to ease the rotation of the nut.

On the underside of the carriage body, preferably one next each margin thereof nearest the cleats, are two L-brackets 42 of which one leg of each is flatwise of and welded to the carriage, and of which the other leg depends from the carriage in a plane transverse to the worm. The worm passes freely through the said depending leg of the bracket so the bracket may move along the worm without any threaded engagement therewith. On the worm, and having threaded engagement therewith, and located between the said brackets, is a follower 43. Said follower is constructed and arranged to be non-rotatable with respect to the carriage, but is movable with respect to the carriage in a direction longitudinally of the worm. According to the present showing, said follower has a block portion 44 through which the worm is threaded, and has a plate or head portion 45 which is integral with the block portion and which has flatwise engagement for a considerable area with the underside of the carriage to counteract turning moment applied to the block by the worm. Two coiled compression springs 46 are provided on the worm, one between each of the aforementioned brackets and the follower. The motor support 17 may consequently be applied with either end thereof toward the pump 11 or other instrumentality to be driven and tension in the belt is then regulated by compression of the spring more distant from the instrumentality. Thus the spring which furnishes the belt tension is not only under compression but applies its force to the end of the carriage which is more remote from the said instrumentality and thereby lends itself to more free sliding of the carriage on the rails in partially overcoming the canting action of the belt tension on the carriage.

The invention furthermore presents the additional utility for vertically mounted supports as shown in Fig. 8, as it will be observed in that arrangement that the weight of the motor may be carried in whole or in part by the uppermost spring whereas the lower one of the springs may be used to supplement the weight of the motor to obtain the desired belt tension.

The support shown in Figure 7 is here made to exemplify utilization of a plurality of worms for operating the tensioning means and the simultaneous operation of said worms, together with inclusion of a plurality of compression springs for each direction of resilient action on the carriage.

The construction of Figure 7, shown in use in Fig. 8, is intended for much larger and heavier motors than used with the previously described support, and wherein greater belt tension is required. However, like numerals of reference are applied to pump or other instrumentality 11 and its driven pulley 12, and to the driving belt 13 extending from driving pulley 14 on the armature shaft 15 of motor 16 all of which are generically the same as previously described differing essentially only in size, power and weight therefrom. Broadly considered, likewise, the motor of this modification is mounted upon a support designated generally by reference numeral 17a differing in detail from previously described support 17.

In the specific embodiment of the invention illustrated in Figure 7, support 17a is shown as having a pair of parallel cleats 18a which are bolted

or otherwise secured in use, as in Fig. 8, on a base 19 or other surface to which the said instrumentality 11 is also fixed. The rails 17a shown herein are constituted in parallel flanges 50 at each side of the support, with one flange 50 above the other and providing passageway for rollers 51 to ride therebetween, said rollers being trunnioned on carriage sections 52 extending across the support from one pair of rail flanges to the other. The feature emphasized for purposes of the present disclosure is the provision of a plurality of worms 53 for tension adjustment and additional coiled compression springs 54 employed for constituting the adjustable tensioning means for the carriage.

Said worms are located parallel to each other and to the rails and separated from each other to afford a balanced application of force on the carriage near the roller-supported sides thereof. Said worms are longitudinally fixed but are rotatable in the same manner as the single worm 37 of the above described construction, and for that purpose have similar threading with nuts 38 and pins 39 for fixing the nuts and constituting the same as heads on the worms at the outsides of cleats 18a. Likewise the worms do not have threaded engagement with the cleat, but can be freely rotated with respect thereto, and also have washers 41, as before, interposed between the said cleats and nuts or head to distribute the pressure and to ease the rotation. In this instance, since the carriage has a construction providing material depth thereto, the worms conveniently pass through holes therein but without making threaded engagement therewith so the carriage will not be hindered in its reciprocation thereat.

On said worms, and having threaded engagement therewith, and located between said carriage sections, is a follower 55 here shown as a pair of parallel bars 56 transverse to said worms and crossing both. On each worm, between said bars is a follower nut 57 which has threaded engagement with the worm on which located. Preferably said follower nuts are welded or otherwise made non-rotatable with respect to the bars. In this particular showing, the bars, by support upon the nuts on the two worms, cannot swing, but other engagement for nut-holding bars may be utilized within the scope of the invention.

A brace, shown in the form of a fixed plate 58 extends across the device midway of the length of the rails, being shown as having an upturned end next the tracks with a gusset or bracket 59 at each end of the brace for added strength. Said upturned ends of the brace are shown bolted to a filler piece 60 included between the rails and secured in place by welding or otherwise. Individual followers as shown in Figs. 2, 4 and 6 for each worm may be used, if desired, with the heads thereof riding on said plate 58 to prevent rotation of the followers. However, in the specific showing of Fig. 7, no contact of the follower 57 or bars 56 with said plate 58 is necessary or shown.

Two coiled springs 54 are provided on each worm, one between one carriage section and the follower on each worm and one between the other carriage section and the follower on each worm. The pairs of springs thus provided function as previously explained with respect to the single pair of springs to apply, by compression, tension in the driving belt and to provide for spring compression in support of a vertically slidable motor, with the additional benefits of balanced application of force and adaptability to greater loads.

It is a desideratum, where using a plurality of worms, to operate the same simultaneously to increase or decrease the spring compression for both ends of the carriage equally. For this purpose, I have shown each worm provided with a sprocket wheel 61 fast thereon and the sprockets connected with an endless chain 62 thereover. Adjusting either worm consequently adjusts both, and therefore the most accessible nut or head 38 on either worm at either end thereof may be manipulated in making the adjustment.

I claim:

1. A support of the character described, comprising side rails and end cleats rigidly secured together a carriage movable lengthwise of the rails and toward and away from said cleats, a worm paralleling said rails and held against longitudinal displacement by said cleats, a follower on said worm movable thereon and moved by rotation of the worm, said follower having a lateral projection making movable contact with a part of the carriage thereby preventing rotation of the follower as the worm is rotated, and a compression spring between said follower and carriage, said spring being adjustable in compressive force exerted upon said carriage by rotation of said worm in said follower.

2. A support of the character described, comprising side rails and end cleats rigidly secured together, a carriage movable lengthwise of the rails and toward and away from said cleats, a worm paralleling said rails and held against longitudinal displacement by said cleats, a follower on said worm, means having sliding contact with a part of the carriage thereby permitting sliding movement of said follower and preventing rotation of the follower under impetus of said worm, and a compression spring on said worm interposed between the follower and a part of the carriage, said spring being adjustable in compressive force exerted upon said carriage by rotation of said worm in said follower.

3. A support of the character described, comprising side rails and end cleats rigidly secured together, a carriage movable lengthwise of the rails and toward and away from said cleats, a worm paralleling said rails and held against longitudinal displacement by said cleats, a follower on said worm, means permitting sliding movement of said follower and preventing rotation of the follower under impetus of said worm, and compression springs on said worm interposed one between the follower and a part of the carriage toward one end thereof and another between said follower and a part of the carriage toward the other end thereof, said springs being adjustable in compressive force exerted upon said carriage by rotation of said worm in said follower.

4. A support of the character described, comprising side rails and end cleats rigidly secured together, a carriage movable lengthwise of the rails and toward and away from said cleats, said carriage comprising sections each extending crosswise between said rails, a worm paralleling said rails and held against longitudinal displacement by said cleats, a follower on said worm comprising a block having threaded engagement with said worm and having a head in slidable engagement with both sections of said carriage permitting sliding movement of said follower and preventing rotation of said follower under influence of rotation of said worm, and springs between said follower and carriage applying resilient moving force to said carriage.

5. A support of the character described, com-

prising side rails and end cleats rigidly secured together, a carriage movable lengthwise of the rails and toward and away from said cleats, said carriage comprising sections each extending crosswise between said rails, a plurality of worms paralleling said rails and held against longitudinal displacement by said cleats, a follower common to said plurality of worms threaded on each thereof, and resilient means interposed between remote parts of said follower and said carriage for applying resilient moving impetus from said follower at a plurality of places on the carriage.

6. A support of the character described, comprising side rails and end cleats rigidly secured together, a carriage movable lengthwise of the rails and toward and away from said cleats, said carriage comprising sections each extending crosswise between said rails, a plurality of worms paralleling said rails and held against longitudinal displacement by said cleats, a follower common to said plurality of worms threaded on each thereof, and resilient means interposed between remote parts of said follower and said carriage for applying resilient moving impetus from said follower at a plurality of places on the carriage,

and means interconnecting said plurality of worms rotating one from another for simultaneous actuation thereof.

7. A support of the character described, comprising side rails and cleats rigidly secured together, a carriage movable lengthwise of the rails and toward and away from said cleats, a worm paralleling said rails held against longitudinal displacement by said cleats, a follower on said worm movable longitudinally of the worm by rotation of the worm in said follower, means having sliding contact with a part of the carriage holding the follower from rotation, and a compression spring between said follower and carriage, said spring being adjustable in compressive force exerted upon said carriage by rotation of said worm in said follower.

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