Aug. 1, 1939. E. S. BARGER 2,167,793

MOTOR BASE

Filed March 15, 1938

Fig. 1.

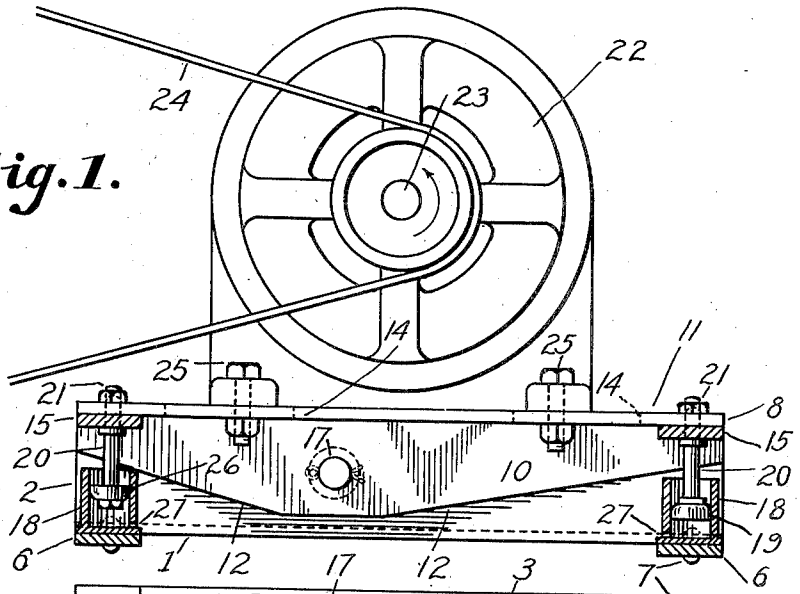


Fig. 2.

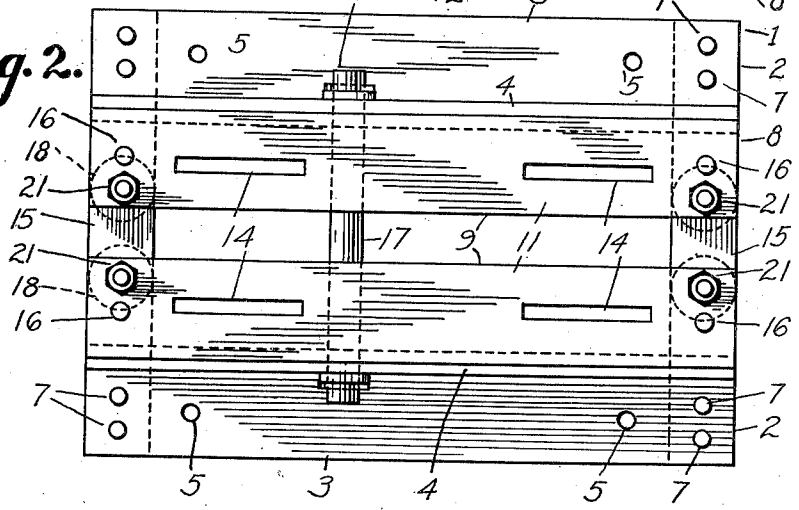
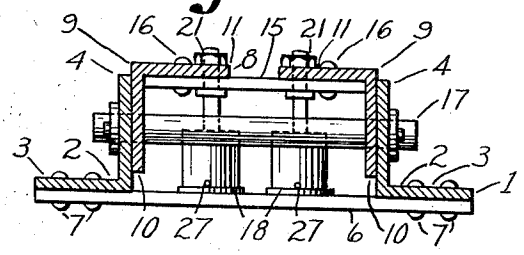


Fig. 3.



E. S. Barger
INVENTOR
BY C. A. Snow & Co.
ATTORNEYS.

Patented Aug. 1, 1939 2,167,793

UNITED STATES PATENT OFFICE

2,167,793

MOTOR BASE

Elbert S. Barger, Paducah, Ky.

Application March 15, 1938, Serial No. 196,078

5 Claims. (Cl. 248—23)

This invention relates to improvements in motor bases, and more particularly to a novel base for the support of a motor having a driving belt, the construction being such that the belt of the motor will be tight while the motor is running, and the tension on the belt will be slacked away when the motor is idle.

An object of my invention is to provide an improved motor base for the pivotal support of a motor which will provide dampening means for taking up the shock or impulse produced when the motor is started or when the load is thrown on or suddenly increases. Another object of the invention is to provide a novel base for the support of an electric motor comprising a platform mounted off-center on a transverse pivot and provided with a plurality of air cushioning or dampening pistons and cylinders which will operate to effectively cushion and dampen any vibration from the motor either in starting or in running, or from any change in the load on the motor and the belt connected with the work which the motor is driving.

A further object of the invention is to provide an improved torque and vibration damper for motor bases, which will be highly efficient in operation, and quite inexpensive to produce. A still further object is to provide a motor base of the above character having means whereby the pivotal movement in a true vertical plane is assured and lateral angular displacement, with resulting misalignment, effectively prevented.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawing which forms a part of this specification,

Figure 1 shows in longitudinal section, a device constructed in accordance with the invention, a motor being mounted thereon;

Figure 2 is a top plan view of the base alone, the motor being omitted; and

Figure 3 is a transverse section through the base.

Like characters of reference are used throughout the following specification and the accompanying drawing to designate corresponding parts.

In carrying out my invention, there is provided a support, generally denoted by the numeral 1. The support 1 includes parallel side beams 2, shown as angle members having horizontal, outwardly extending flanges 3 and vertically upstanding flanges 4 at the inner edges of the flanges 3. There are openings 5 in the flanges 3, adapted to receive securing elements (not shown) whereby the support may be held in place.

Cross bars 6 are located at the ends of the side beams 2 of the support 1, underneath the flanges 3, being fastened to the flanges 3 by securing elements 7, to tie the side beams together.

The device comprises a table or platform 8 which has pivotal vertical movement with respect to the support 1. The table 8 includes side beams 9, shown as angle members having vertical, parallel depending flanges 10 and horizontal, inwardly extended flanges 11. The flanges 10 of the table 8 fit closely but slidably between the flanges 4 of the support 1 and extend the full length of the table. The flanges 11 of the table or platform have elongated slots 14. Cross bars 15 extend underneath the flanges 11, at the ends of the table 8 and are secured at 16 to the flanges 11 to tie the beams 9 together. A pivot member 17, shown as a rod, extends through the flanges 4 of the side beams 2 of the support 1 and through the adjacent flanges 10 of the side beams 9 of the platform 8. The flanges 10 of the table are cut away from their ends, toward a point beneath the pivot member 17, as shown at 12, to facilitate the tilting movement of the platform 8 with respect to the support 1.

Air cushion mechanisms or dash pots are interposed between the platform 8 and the support 1. There may be any desired number of these air cushion mechanisms, four being shown, located two at each end of the base. These air cushion mechanisms comprise cylinders 18 secured to the cross bars 6, and pistons fitting therein. The pistons illustrated in the cylinders 18 at the right hand end of the support, as viewed in Figure 1 are provided with downwardly presented cups or leather packing elements which when forced into the cylinders 18 serve to compress the air and thus cushion or retard the downward movement of the table at that end. The pistons 26 located in the cylinders 18 at the opposite end of the support are provided with upwardly turned leather cups or packing elements and exert only a small amount or no dampening effect when the pistons are moved downwardly in the cylinders. When the pistons are moved upwardly

in the cylinders, however, they tend to form a vacuum below themselves, and thus act to dampen or retard such movement. The stems 20 of the pistons 19 and 26 are secured at 21 to the cross bar 15 of the platform. Minute air passages or restricted vents 27 are formed in the walls of the cylinders 18 adjacent the lower ends thereof, and serve to slowly admit air or to slowly permit the air to escape, as the case may be.

As clearly illustrated in Figures 1 and 2, the transverse pivot member 17, preferably a rod extending between and through the side flanges of the support and the adjacent said flanges of the platform, is positioned considerably more toward one end of the platform than toward the other end thereof, for the purpose which will be later described.

An electric motor 22 or any other desired motor, is mounted on the flanges 11 of the table. The motor 22 is provided with a pulley 23 about which a belt 24 is passed. Securing elements 25 connect the motor 22 with the flanges 11 of the table, and pass through the slots 14. This construction is to accommodate two motors of different dimensions, and enables the motor to be shifted longitudinally of the platform 8, for adjustment.

It will be noted that the motor is mounted "off-center" on the platform, that is to say, the center of gravity lies to one side of the pivot 17. Thus the weight of the motor tends to turn the platform about its pivot in a clockwise direction, or toward the right as viewed in Fig. 1, thus maintaining the belt 24 extended.

The mode of operation of my improved motor base is as follows:

The motor 22 is secured to the table, as illustrated in the drawing, and the belt 24 placed over the pulley 23, and also over the work to be driven by the said motor. It is a well known fact that when the electric current is applied to an electric motor in starting, there is always a jerk due to the reaction from the torque, and the same is true when the load is first thrown on. This movement or jerk is of course, in a direction opposite to the direction of rotation of the motor shaft. In order to realize the advantages of the present invention, there must be a definite relation between the direction of rotation of the motor shaft, the direction in which the belt extends, and the side of the pivot on which the center of gravity of the motor lies. The arrow shown in Fig. 1 of the drawing indicates the direction of rotation of the motor shaft. The reaction from the torque, when the load comes on, will of course, tend to turn the motor frame in the opposite direction, that is to say this reaction will tend to rock or tilt the platform 8 in a clockwise direction, or toward the right as viewed in Fig. 1.

From the foregoing description, it will now be understood that the character of the cup leathers 19 and 26, and the manner in which they are formed, are such that they both simultaneously tend to strongly resist this right-handed pivotal movement of the platform, the cup leathers 19 resisting by virtue of the fact that they compress the air beneath them, and the cup leathers 26 resisting by reason of the reduced pressure created below them. As these pistons or cup leathers move under the influence of the reaction from the torque of the motor, the air slowly escapes from the restricted vents 27 under the pistons 19, and is slowly drawn in to fill the partial vacuum created under the pistons 26. Thus all of these pistons and cylinders act as dash pots to retard or dampen the pivotal movement of the platform 8 in the direction in which it moves under the influence of the torque reaction of the motor. Thus when the motor is started or when a load is suddenly thrown on it, the resulting pivotal movement of the platform takes place slowly and evenly, because of the checking action of the cylinders and pistons above described, and the operation of the motor is thus rendered extremely steady and stable.

It will also be noted that while the weight of the motor normally tends to rock the platform about its pivot in such a direction as to maintain the belt 24 extended, when the load comes on the motor the torque reaction tends to turn the platform further in the same direction, thus automatically increasing the tension on the belt.

When the supply circuit is opened, or when the load is thrown off of the motor, this force tending to rock the platform and tighten the belt is diminished, and the belt therefore slackens, but it will be noted that this return pivotal movement of the platform is preferably not checked or dampened by the dash pots, but is allowed to take place substantially freely. The movement is dampened only as the load comes on.

It will be understood that the checking or retarding of the rocking movement of the platform by the dash pots as the load comes on the motor is of a wholly different nature from the resilient effect produced by springs or closed air cushions. Such resilient devices would tend to produce a rebound, which is very objectionable. With the air cylinders provided with restricted vents as shown, I obtain a steady retarding or dampening action which wholly prevents undesired vibration or oscillation of the motor. By the term "dash pot" as used in the claims, I therefore intend to mean a fluid controlled cushioning device in which means such as a restricted by-pass or bleed port are provided for permitting the slow passage or escape of fluid, inwardly or outwardly, when force is applied.

By reference to Fig. 3, it will be noted that the flanges 4 and 10 which, as above described, lie closely adjacent each other in vertical planes, constitute parallel bearing surfaces which extend a substantial distance on both sides of the pivot 17 and which serve to guide the pivotal movement of the platform and ensure such movement being confined substantially to a vertical plane. The interengagement of these flanges or bearing surfaces serves to prevent any lateral angular displacement of the platform, with resulting misalignment of the motor. I regard this as also constituting an important feature of the invention.

Many minor changes in detail of construction may be resorted to without departing from the spirit of the invention.

I claim:

1. A motor base comprising a platform mounted for pivotal movement about an axis parallel with the motor shaft, means for securing a motor to said platform, and dash pot means for retarding oscillatory movement of said platform about said axis.

2. A motor base comprising a platform mounted for pivotal movement about an axis parallel with the motor shaft, means for securing a motor to said platform, and dash pot means for dampening oscillatory movement of said plat-

form about said axis substantially in one direction only.

3. A motor base comprising a platform mounted for pivotal movement about an axis parallel with the motor shaft, means for securing a motor to said platform, and a single acting dash pot connected with a fixed support and with said platform for retarding its pivotal movement in the direction in which it tends to turn due to the reaction of the armature torque.

4. The combination with a motor having a driving pulley, and a belt on said pulley, of a motor base comprising a pivotally mounted platform, means for securing the motor to said platform in a position at one side of the pivot, so that the weight of the motor tends to turn the platform in a direction to maintain said belt extended, and dash pot means for retarding the pivotal movement of the platform in that direction.

5. The combination with a motor having a driving pulley, and a belt on said pulley, of a motor base comprising a pivotally mounted platform, means for securing the motor to said platform in a position at one side of the pivot, so that the weight of the motor tends to turn the platform in a direction to maintain said belt extended, the direction of rotation of the motor being such that the reaction due to the torque, when the load increases, tends to turn the platform further in the same direction as the weight of the motor tends to turn it and thus tighten said belt, and dash pot means for retarding the pivotal movement of the platform in that direction.

ELBERT S. BARGER.