March 19, 1935. L. ROSTOKER 1,995,190

VIBRATION DAMPER

Filed June 13, 1934

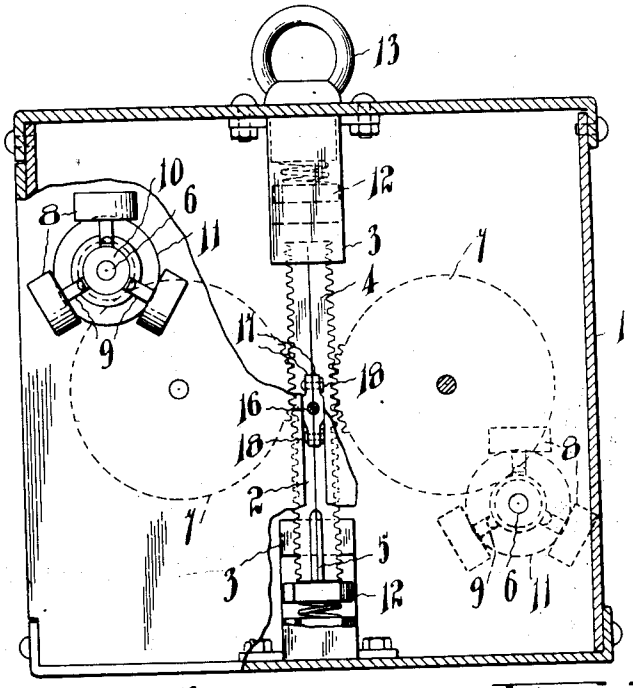


Fig. 2.

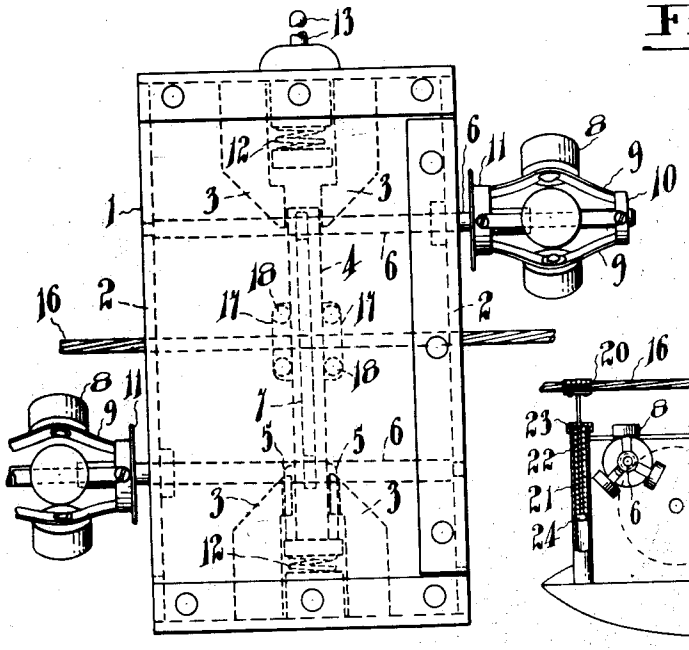


Fig. 1.

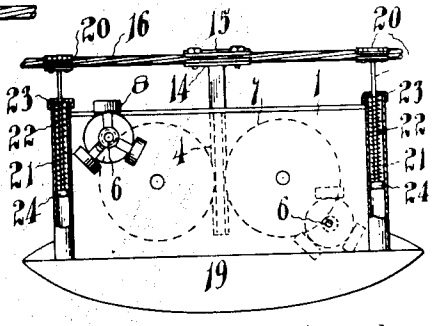


Fig. 3.

Inventor

L. Rostoker

By J. Edw. Maybee

Patented Mar. 19, 1935

1,995,190

UNITED STATES PATENT OFFICE

1,995,190

VIBRATION DAMPER

Louis Rostoker, Toronto, Ontario, Canada

Application June 13, 1934, Serial No. 730,538

4 Claims. (Cl. 173—13)

This invention relates to means for checking the excessive vibration of electrical transmission cables, and my object is to devise simple and effective apparatus for this purpose which will check vibration either against the reaction of a stationary part or against the inertia of a weight.

I attain my object by means of a construction which may be briefly described as follows.

In a suitable casing is suitably guided a toothed rack which is connected with the cable, whose vibrations are to be damped. The toothed rack by a speed multiplying gear train drives a spindle journalled in the casing. Resistance to the rotation of the spindle is provided, which resistance increases with the speed, and preferably faster than the speed. I show for this purpose fly balls, such as used in centrifugal governors which move radially outward as speed increases. Preferably resilient cushions are provided to limit the reciprocating movements of the rack. The casing is either secured to the cable support or is weighted to increase its inertia and is hung from the cable by springs.

The invention is hereinafter more fully described and is illustrated in the accompanying drawing in which

Fig. 1 is a front elevation, partly broken away, of the device as arranged for suspension from a fixed support;

Fig. 2 a vertical section; and

Fig. 3 a front elevation, on a smaller scale, of a modification showing the device suspended from a cable.

In the drawing like numerals of reference indicate corresponding parts in the different figures.

Referring particularly to Figs. 1 and 2, 1 is a casing, the top of which is provided with the eye 13 by means of which it may be suspended from part of a tower or other support. In its sides are formed the slots 2 for the passage of the cable 16, which, of course, will be suspended in any ordinary manner from the support or tower to which the casing 1 is connected. At top and bottom of the casing are formed the guides 3, in which guides the rack 4 is vertically slidable, being provided with splines 5 fitting in grooves in the guides whereby it is held in position but is freely movable longitudinally. This rack is divided longitudinally into two parts, between which the cable 16 is clamped, the rack being provided with the flanges 17 through which pass the bolts 18, which, when tightened up, securely clamp the rack to the cable. The rack is toothed at each side to mesh with two gear trains 7, which respectively drive two spindles 6 at opposite sides of the rack. These gear trains are proportioned to gear up the rotations of the spindles relative to the first gear on the train which engages the rack.

It will be evident then that up and down movement of the cable 16, due to its vibration, will cause the spindles 6 to be rotated first in one direction and then in the other, having speed proportionate to the rapidity of the vibratory movement. Each spindle 6 is provided with means yieldingly resisting the setting in motion of the spindle. Such means is preferably of the inertia type and is shown as comprising an ordinary centrifugal governor. This governor comprises the fly balls 8 which are connected to the flat bent springs 9, one end of each spring being connected with a disk 10 fixed on the spindle and the other to a disk 11 slidable on the spindle.

Thus as the spindle is rotated and its speed increases the fly balls move outwardly increasing the resistance to rotation about the spindle and thus increasing the dampening effect on the movement of the cable. The dampening effect is thus adjusted nicely to the violence of the vibratory motion of the cable. As the extreme range of the vibratory movement can be fairly closely determined I find it desirable to resiliently limit the reciprocatory movement of the rack, and for this purpose I provide in each guide 3 a spring cushion 12, which, in the case of extreme vibratory movement, co-operates with the fly ball governors in checking the movement.

If the device is to be suspended from the cable itself certain modifications are necessary. A suitable arrangement for this purpose is shown in Fig. 3 of the drawing. In this case the casing is preferably weighted by the attachment thereto of the weight 19. The rack 4 is provided with a head 14 at its upper end by which it may be secured to the cable, the clamp 15 being provided for this purpose. The casing is hung by springs from the cable so that the inertia of the casing and its weight may be utilized as the reaction against which the movements of the cable will act. Any spring suspension will suit the purpose, but I show hangers 20 clamped to the cable, which extend into guides 21 formed in the ends of the casing. Springs 22 are fitted in the casing, which springs fit against the caps 23 on the guides 21 and a head 24 connected to the lower end of the hangers. The casing is thus suspended so that its inertia is available to enable the rack to move relative to the gear train and thus set the spindles in motion as hereinbefore described.

It will be understood, of course, that various changes may be made in the details of the con-

struction which would fall within the scope of my invention.

What I claim as my invention is:

1. A vibration damper for aerial cables comprising a casing; a rack slidably guided in the casing and adapted for connection at right angles to a cable; a spindle journalled in the casing; a speed multiplying gear train between the rack and the spindle adapted to cause the spindle to rotate in one direction or the other according to the direction of motion of the rack relative to the casing; and means yieldingly resisting the setting in motion of the spindle in either direction comprising governor fly balls rotated by and about the spindle in one direction or the other according to the direction of motion of the spindle.

2. A vibration damper for aerial cables comprising a weighted casing; spring suspension means connected with the casing and adapted for connection with a cable; a gear train mounted on the casing; an actuating member for the gear train adapted for connection at right angles to a cable; a spindle journalled in the casing, the gear train being adapted to cause the spindle to rotate in one direction or the other according to the direction of motion of the actuating member relative to the casing; and inertia means yieldingly resisting the setting in motion of the spindle.

3. A vibration damper for aerial cables comprising a weighted casing; spring suspension means connected with the casing and adapted for connection with a cable; a gear train mounted on the casing; an actuating member for the gear train adapted for connection at right angles to a cable; a spindle journalled in the casing, the gear train being adapted to cause the spindle to rotate in one direction or the other according to the direction of motion of the actuating member relative to the casing; and inertia means yieldingly resisting the setting in motion of the spindle in either direction.

4. A vibration damper for aerial cables comprising a weighted casing; spring suspension means connected with the casing and adapted for connection with a cable; a gear train mounted on the casing; an actuating member for the gear train adapted for connection at right angles to a cable; a spindle journalled in the casing, the gear train being adapted to cause the spindle to rotate in one direction or the other according to the direction of motion of the actuating member relative to the casing; and inertia means yieldingly resisting the setting in motion of the spindle in either direction comprising governor fly balls rotated by and about the spindle in one direction or the other according to the direction of motion of the spindle.

LOUIS ROSTOKER.