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R. BRENNE

GUIDE SHOE FOR ELEVATORS

Filed June 21, 1920

Fig. 1

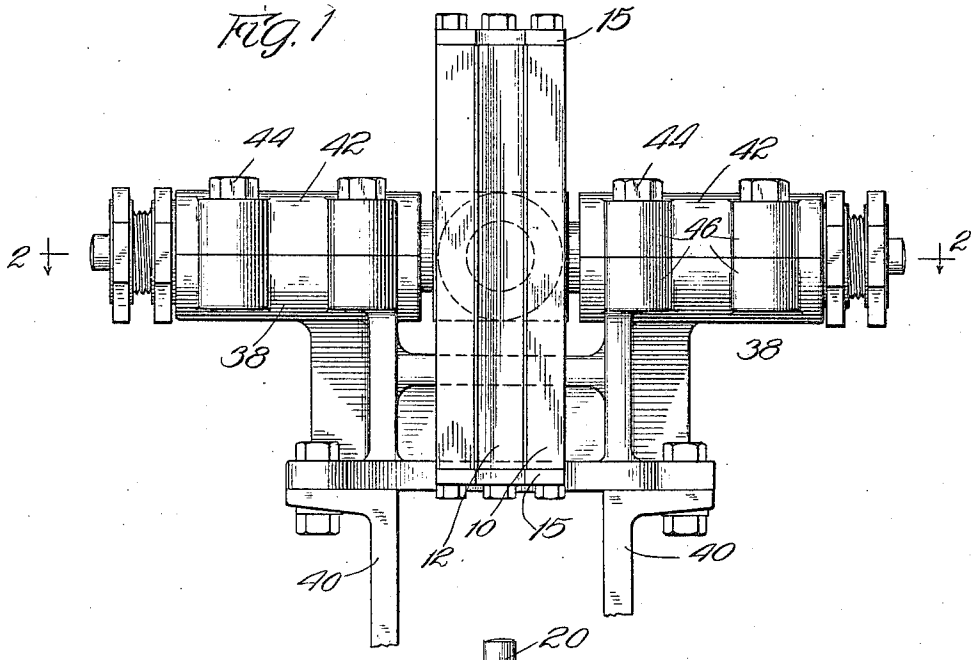
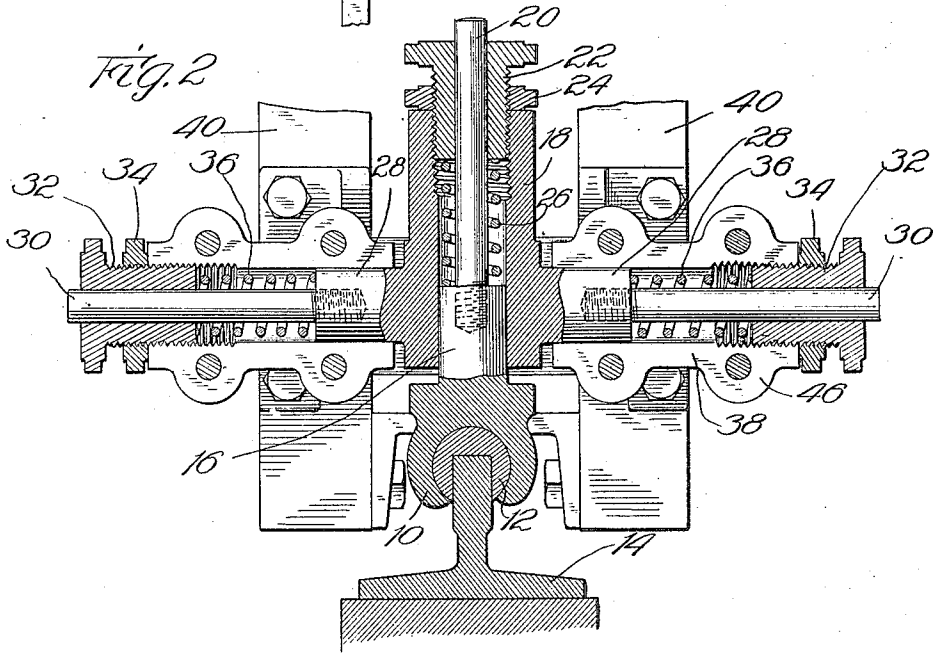



Fig. 2




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# UNITED STATES PATENT OFFICE.

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## GUIDE SHOE FOR ELEVATORS.

Application filed June 21, 1920. Serial No. 390,324.

*To all whom it may concern:*

Be it known that I, RICHARD BRENNE, 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 Guide Shoes for Elevators, of which the following is a specification.

My invention relates to elevators and more specifically to an improved guide shoe for holding an elevator car in proper alinement with the shaft during its movement up and down the same.

The general object of my invention is to guide the elevator car more quietly and smoothly than has heretofore been possible.

Another object is to devise a shoe which will provide suitable guiding forces and at the same time allow for all irregularities in the construction of the shaft and guide rails.

An advantage of the construction employed is that the wear between the guide shoe and the rail is greatly decreased, resulting in increased durability and corresponding economy.

Further objects and advantages of my invention will become apparent as the description proceeds.

In the accompanying drawings Figure 1 is a side elevation and Fig. 2 a section on the line 2—2 of Fig. 1 of a guide shoe constructed according to my invention.

In the embodiment of my invention selected for illustration the shoe member proper 10 carries the usual anti-friction filler 12 which has operative engagement with the edge and part of both sides of a vertical guide rail 14. Plates 15 may overlie the ends of the shoe 10 and filler 12 to hold the filler in place. The shoe member 10 is supported for rotation and reciprocation about a horizontal axis by means of a trunnion 16 slidable and rotatable in a sleeve 18. The trunnion carries a guide bolt 20 projecting through a plug 22 threaded into the rear end of the sleeve 18 and locked in position by a suitable lock nut 24. To press the shoe member toward the rail and maintain it at all times in proper engagement with the same a helical spring 26 encircles the bolt 20 having abutment against the plug 22 and the end of the trunnion 16. The compression stress of the spring may be adjusted by screwing the plug 22 in or out of the sleeve.

The movement allowed the shoe member by the mounting above secured will take care of slight displacements between the elevator car and the rail along the axis of the trunnion 16 and allow for portions of the rail which happen to be twisted slightly out of the vertical. This, however, is not sufficient to take care of the irregularities of the rail, as if any portion of the rail is not vertical, a shifting in a horizontal direction transverse to the axis of the trunnion 16 must occur as the car moves up and down past the inclined portion of the rail. Also, if portions of the rail are nearer the path of movement of the car than other portions; where the distance is changed the edge of the rail is not vertical but slants toward or away from the car. This would make the edge of the rail engage the filler 12 at one end of the filler only, bearing against that end with a pressure so great that the filler is rapidly worn away.

According to my invention I avoid the above mentioned difficulties and defects by mounting the sleeve 18 for rotation around a horizontal axis transverse to the axis of the trunnion 16 and also by allowing the sleeve 18 to reciprocate slightly along its axis of rotation. For this purpose the sleeve 18 carries laterally directed trunnions 28 similar to the trunnion 16 and similarly journaled. The laterally directed bolts 30 are slidable through plug 32 similar to the plug 22 which guides the bolt 20 and may be adjusted to stress the compression springs 36, and locked in position by lock nuts 34. To facilitate ready removal of the sleeve 18 the bearings for trunnions 28 are preferably formed in two halves, the lower halves 38 being part of a casting bolted to the frame 40 of the elevator car, and the upper halves 42 being suitably fastened in place by bolts 44 engaging lugs 46 formed on the two halves. It will be apparent that the axis of the shoe may be inclined slightly from the vertical in any plane and may shift in a horizontal direction in any plane through a limited displacement under the resilient action of the compression springs. A positive limit to the horizontal displacements of the shoe is imposed by abutment of the shoe 10 against sleeve 18, and by abutment of sleeve 18 against the bearings for trunnions 28. In normal operation such abutment does not oc-

cur but it is a desirable safeguard against movement of the car beyond the amount allowed by its clearance in the shaft.

The guide rail need only be straight and true within the limits imposed by the range of accommodation of the guide shoe which limits may readily be made large enough so that the rail may easily be brought well within them. This not only eliminates the necessity for great precision in alining the portions of the rail, but insures a uniform pressure between the rail and the filler which could not be obtained with a rigid mounting for sleeve 18 by any precision practicable in such devices, and which materially reduces friction and noise and very greatly increases the life of the filler.

While I have illustrated and described in detail the preferred embodiment of my invention, it should be clearly understood that the disclosure is merely for purposes of illustration and that many modifications and variations will naturally occur to those skilled in the art. I aim in the subjoined claims to cover all such legitimate variations and modifications.

I claim as my invention:

1. In combination with an elevator car and a vertical guide rail, a shoe carried by said car and having operative engagement with said rail, and means for mounting said shoe on said car, said means including resilient means for permitting said shoe to be translated in any horizontal direction.

2. In combination with an elevator car and a vertical guide rail, a shoe carried by said car and having operative engagement with said rail, and means for mounting said shoe on said car permitting of rotation and translation upon two mutually perpendicular axes respectively.

3. A guide shoe for elevators comprising a shoe member, a sleeve supporting said shoe member and allowing said member to rotate and shift along the axis of the sleeve, trunnions on said sleeve and bearings supporting said trunnions and allowing said sleeve to rotate and shift about an axis perpendicular to the axis of the sleeve.

4. An elevator guide shoe having, in combination, a shoe member, a horizontal trunnion on said shoe member, a sleeve for receiving said trunnion, resilient means limiting the reciprocation of said trunnion in said sleeve, horizontal trunnions carried by said sleeve extending at right angles to the axis of the sleeve, bearing members supporting said trunnions and resilient means limiting the reciprocation of said last named trunnions in said bearing members.

5. An elevator guide shoe having, in combination, a shoe member having a horizontal trunnion, a sleeve receiving said horizontal trunnion and having laterally directed trunnions extending at right angles to said first-mentioned trunnion, bearing members supporting said laterally directed trunnions, duplicate bolts extending from the ends of all said trunnions, duplicate plugs receiving the ends of all said bolts in sliding engagement and compression springs encircling said bolts and abutting said plugs and the ends of said trunnions to limit the displacement of said trunnions.

6. In combination with an elevator car and a vertical guide rail, a guide shoe having operative engagement with said rail and mounting means supporting said guide shoe upon said car, said mounting means permitting rotation of said guide shoe around each of two mutually perpendicular horizontal axes and including resilient means permitting a limited displacement of said guide shoe in any direction in a horizontal plane, and additional positive means imposing a definite limit on horizontal displacement of said guide shoe.

In testimony whereof, I have hereunto set my hand.

RICHARD BRENNE.