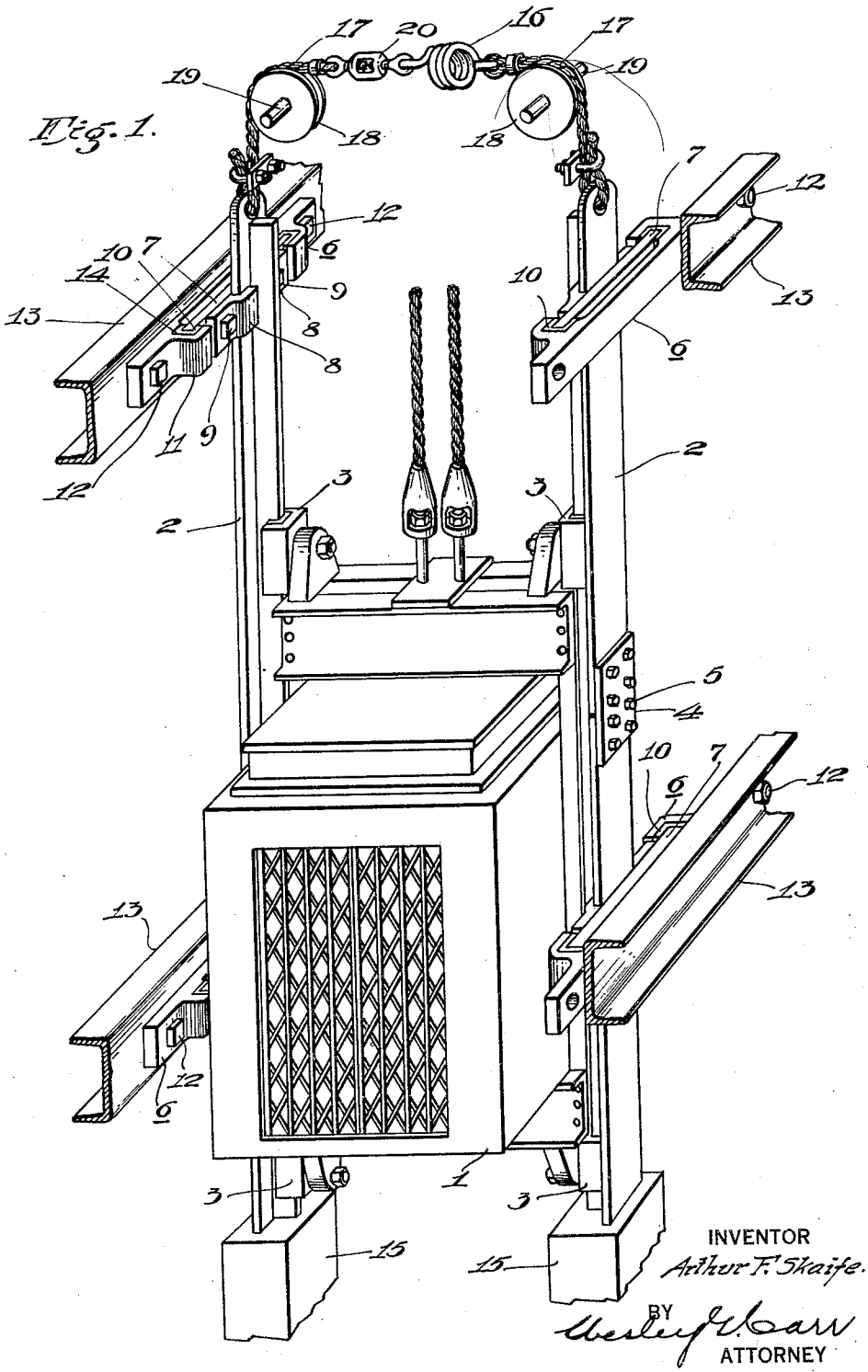
April 25, 1933. A. F. SKAIFE 1,905,248

ELEVATOR GUIDE SYSTEM

Filed Dec. 3, 1929 2 Sheets-Sheet 1

Fig. 1.



INVENTOR
Arthur F. Skaife.
BY
Wesley J. Baer
ATTORNEY

April 25, 1933. A. F. SKAIFE 1,905,248

ELEVATOR GUIDE SYSTEM

Filed Dec. 3, 1929 2 Sheets-Sheet 2

Fig. 2.

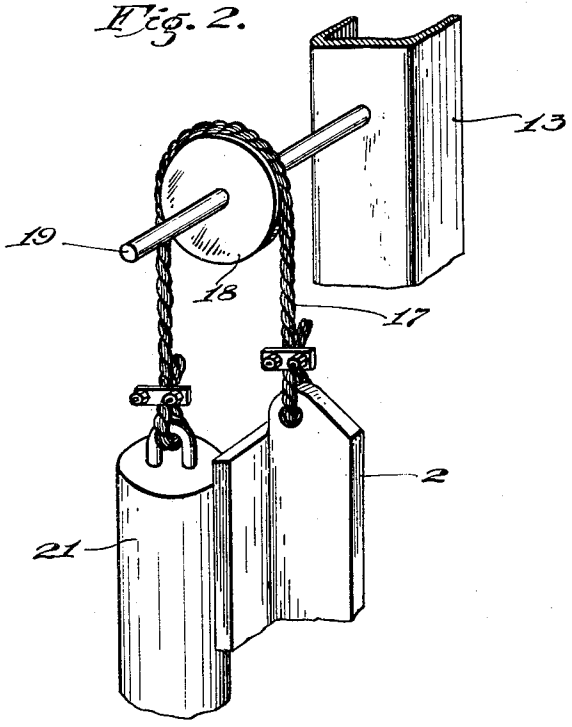
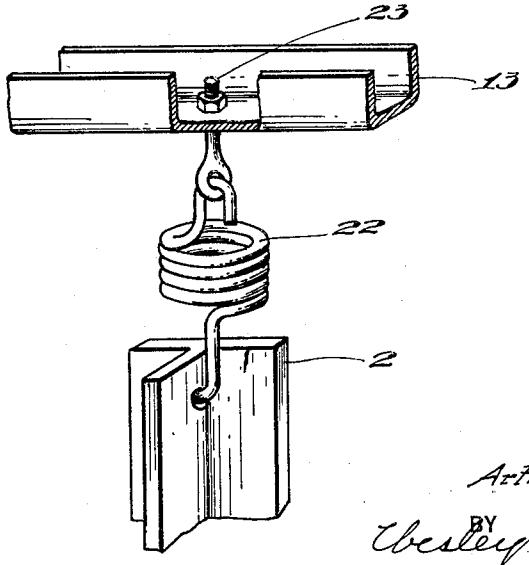


Fig. 3.



INVENTOR
Arthur F. Skaife.
BY
Wesley J. Barr
ATTORNEY

Patented Apr. 25, 1933

1,905,248

UNITED STATES PATENT OFFICE

ARTHUR F. SKAIFE, OF BERKELEY, CALIFORNIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA

ELEVATOR GUIDE SYSTEM

Application filed December 3, 1929. Serial No. 411,278.

My invention relates to means for constraining the motion of moving bodies and particularly to means for aligning and supporting the guide rails of an elevator car.

Heretofore, elevator cars have been guided in a vertical path by a plurality of continuous metal rails, each rail being rigidly attached to the elevator hatchway walls or building structure at a plurality of points. Rails mounted in this manner are not adapted to compensate for their expansion due to temperature variations or for stresses set up in them by settling of the building structure. Under such conditions, each section of a guide rail between a pair of consecutive points of support acts as a column with a load applied at the extremities of the column, and the rail so mounted has a tendency to become bowed or distorted. Also, the rails, as heretofore mounted, tend to concentrate their entire weight upon the lower guide-rail supports, thus increasing the possibility of distortion in the lower rail sections.

It is extremely important, in elevator design, to insure continuously perfect alignment of the guide rails. The modern tendency toward taller buildings and, consequently, high-speed elevator service, has increased the possibility of guide-rail misalignment due to building settling and to increased guide-rail weight which tends to excessively stress the lower guide-rail sections and has also increased the necessity for accurate alignment in order to decrease vibration in the operation of high-speed elevator cars.

It is an object of my invention to decrease the liability of distortion in guide members for moving bodies.

It is a further object of my invention to flexibly counterbalance a portion or all of the weight of the guide members for moving bodies.

It is a still further object of my invention to provide a system for supporting elevator guide members which shall permit the guide rails to automatically adjust themselves with respect to the supporting system, thereby preventing the application of distorting forces to the guide rails through the supporting system.

I provide novel aligning members for the guide rails of an elevator which permit the rails to move freely, relative to these members, in the direction of travel of the elevator car and prevent motion of the guide rails in other directions. I provide further a flexible system for counterbalancing all or a portion of the weight of the guide rails to reduce the stress on their lower portions.

My invention is described with reference to the accompanying drawings, of which Fig. 1 is a diagrammatic isometric view of an elevator guide system embodying a preferred form of my invention.

Figs. 2 and 3 show isometric drawings of modifications of my means for counterbalancing a portion of the guide-rail weight.

Referring to the drawings in detail, Fig. 1 shows an elevator car 1 slidably guided by steel guide rails 2 by means of suitable guide shoes 3. The guide rails 2, which run the full length of the elevator shaft, are usually constructed in sections rigidly united by couplings, such as metal plates 4 and bolts 5.

In order to position the guide rails, a plurality of brackets 6 are provided, each bracket comprising a metal bar 7 of rectangular cross-section rigidly fastened to guide rail 2 by any suitable detachable connection, such as clamps 8 and bolts 9. The ends of bar 7 are slidably fitted into slots 10 in a metal housing 11 which is rigidly fastened by bolts 12 to the elevator hatchway wall or supporting beam 13. The slots 10 may be lined with Babbitt metal or other suitable friction-reducing material 14. The supporting member 13 is an integral part of the building structure. Since the rail bar 7 is freely slidable in the vertical direction, with reference to the housing 11, it follows that the assembled brackets 6 will hold the rail in vertical alinement but will permit relative movement to such degree as will ensure avoidance of rail distortion.

It will, therefore, be necessary to support the weight of the rail independently of the brackets 6. Such independent support may be afforded by a block 15 upon which the lower end of the rail may rest.

When the building to which my invention

is to be applied is of relatively low height, such as eight or ten floors, the support at the lower end of the rail is sufficient to permit the rail to be self adjusting as the building settles, without producing a distorting effect upon the rails.

However, if the building is of great height, the weight of the rail may be so great as to place sufficient strain upon the lower portion thereof to cause distortion.

In order to compensate for the weight of a long rail, I provide additional supporting means therefor at the upper end of the rail which I have illustrated in Fig. 1 as comprising a spring 16 connected between the upper ends of the guide rails 2 by means of cables 17. Each cable 17 is guided by means of a pulley 18 rotatably attached to the elevator hatchway structure 13 by shaft 19. An adjusting turn buckle 20 permits the cable length to be varied until the spring 16 carries a predetermined tension sufficient to compensate for the excess weight of a long rail. Each guide rail mounted in this manner serves as a counterbalance for the guide rail connected thereto.

When forces, such as those due to settling of the building, alter the spacing of brackets 6 which are rigidly attached to the building structure, the brackets slide freely with respect to the guide rail mounted therein without applying the distorting forces to the guide rail. Owing to this construction, the guide rail has no tendency to become bowed or distorted. The clamps 8 are provided to permit convenient separation of the guide rails from the brackets.

In the modification shown in Fig. 2, a cable 17 serves to connect guide rail 2 to a counterweight 21. A pulley 18, over which cable 17 is guided, is rotatably mounted on a shaft 19 which is attached to the building structure 13 and serves to transfer all or a portion of the weight of the guide rail 2 to the upper supporting structure.

In the modification shown in Fig. 3, a spring 22 serves to transmit all or a portion of the weight of guide 2 to the upper supporting structure 13. An adjusting screw 23 permits the spring tension to be varied until the spring transmits the desired portion of the guide-rail weight.

In the preceding disclosure, a system has been described for maintaining more perfect alignment of constraining members for moving bodies than has heretofore been possible.

Since various modifications are possible within the scope of my invention, as defined in the appended claims, I do not wish to be limited to the particular forms herein described, except as defined in the appended claims.

I claim as my invention:

1. An alignment device for guide rails of an elevator car comprising bearing means secured to said rails, and means engaging said bearing members to permit movement of the guide rails only in the direction of travel of the elevator car.

2. In a bracket for attaching elevator guide rails to a building structure, a bearing member, means for securing the rail to said member and means for slidably securing said bearing member to the building structure.

3. In a bracket for attaching elevator guide rails to a building structure, a bearing member, means for rigidly securing the rail to said bearing member and means for slidably securing said bearing member to the building structure.

4. In a bracket for attaching elevator guide rails to a building structure, a bearing member, means for rigidly securing the rail to said bearing member and means secured to said building structure for engaging said bearing member to permit free movement thereof in one direction.

5. In a bracket for attaching elevator guide rails to a building structure, a bearing member, means for rigidly securing the rail to said bearing member and means secured to said building structure for engaging said bearing member to permit free movement thereof in a vertical direction.

6. In a bracket for attaching elevator guide rails to a building structure, a bearing member rigidly secured to said rail and means secured to said building structure for inter-engaging said bearing member to permit free movement thereof in a vertical direction.

7. An elevator guide-rail support comprising a bearing plate, means for securing said plate to the guide rail, a bracket for attachment to the elevator hatchway structure and means on said bracket for securing said plate against lateral movement in any direction while permitting free movement in a vertical direction.

8. An elevator guide-rail support comprising a bearing plate, means for securing said plate to said rail, a bracket for attachment to the hatchway structure having a vertical slot therein for engaging said bearing plate to secure said plate against lateral movement in any direction while permitting free movement in a vertical direction.

9. An elevator guide-rail support comprising a bearing plate, means for securing said plate to said rail, a bracket for attachment to the hatchway structure having a vertically-extending slot therein for engaging said bearing plate and filler means between said slot and said plate for providing a frictional engagement between said bracket and said plate to secure said plate against lateral movement in any direction while permitting substantial movement in a vertical direction.

10. In a system for guiding an elevator car in a hatchway, a rigid rail extending throughout the height of the hatchway, means for

supporting said rail with all parts of said rail which are effective to guide the car under tension, and stationary means for preventing lateral movement of said guide rail.

11. In a system for guiding an elevator car in a hatchway, a rigid rail extending throughout the height of the hatchway, means for securing said rail in said hatchway with the major portion thereof under tension, and stationary means for preventing lateral movement of said guide rail.

12. An alignment device for the guide rail of an elevator car comprising a bearing member secured to said rail and means engaging said bearing member to permit movement of the guide rail only in the direction of travel of the elevator car.

13. A constraining system for a moving body comprising means for guiding said body in a predetermined path and means for slidably positioning said means whereby it is freely movable only in the direction of travel of said moving body.

14. A constraining system for a moving body comprising means for guiding said body in a predetermined path, means for positioning said guiding means whereby it is freely movable in the direction of travel of said moving body and a support for said guiding means comprising means for flexibily counterbalancing a portion of the weight of the guiding means.

15. In a constraining system for elevator cars, a plurality of guide members, a plurality of clamps rigidly and removably attached to said guide members, a plurality of brackets each comprising a slotted member fixed with respect to the elevator hatchway wall and adapted to position one of said clamps, said slotted member freely permitting movement of said clamp in the direction of travel of the elevator cars.

16. In a constraining system for a moving body, means for guiding said body in a predetermined path, a plurality of rigid members removably attached to said guiding means, a plurality of brackets for aligning said guiding means, each of said brackets comprising, a slotted member and babbitt linings in the slots of said member, said slots being adapted to slidably house one of said rigid members whereby said rigid member is free to move in one direction only.

17. In a constraining system for elevator cars; a plurality of guide rails for maintaining said cars in a predetermined path, means for supporting said guide rails comprising a resilient member, cables adjustable as to length for attaching said guide rails to the member, pulleys rotatably attached to the elevator hatchway walls for guiding said cables and for transmitting a portion of the guide-rail weight to said walls.

18. In a constraining system for elevator cars, a plurality of guide rails for maintaining said cars in a predetermined path, resilient means for counterbalancing a portion of the guide-rail weight comprising a plurality of springs, means for fixing one end of each spring with respect to a guide rail and the opposite end with respect to the guide rail support and means for adjusting the tension of said springs.

In testimony whereof, I have hereunto subscribed my name this 22nd day of November, 1929.

ARTHUR F. SKAIFE.