A. G. WUEST.

AUTOMATIC FRICTION BRAKE MECHANISM FOR ELEVATORS OR HOISTS.

APPLICATION FILED JULY 3, 1908.

903,805. Patented Nov. 10, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

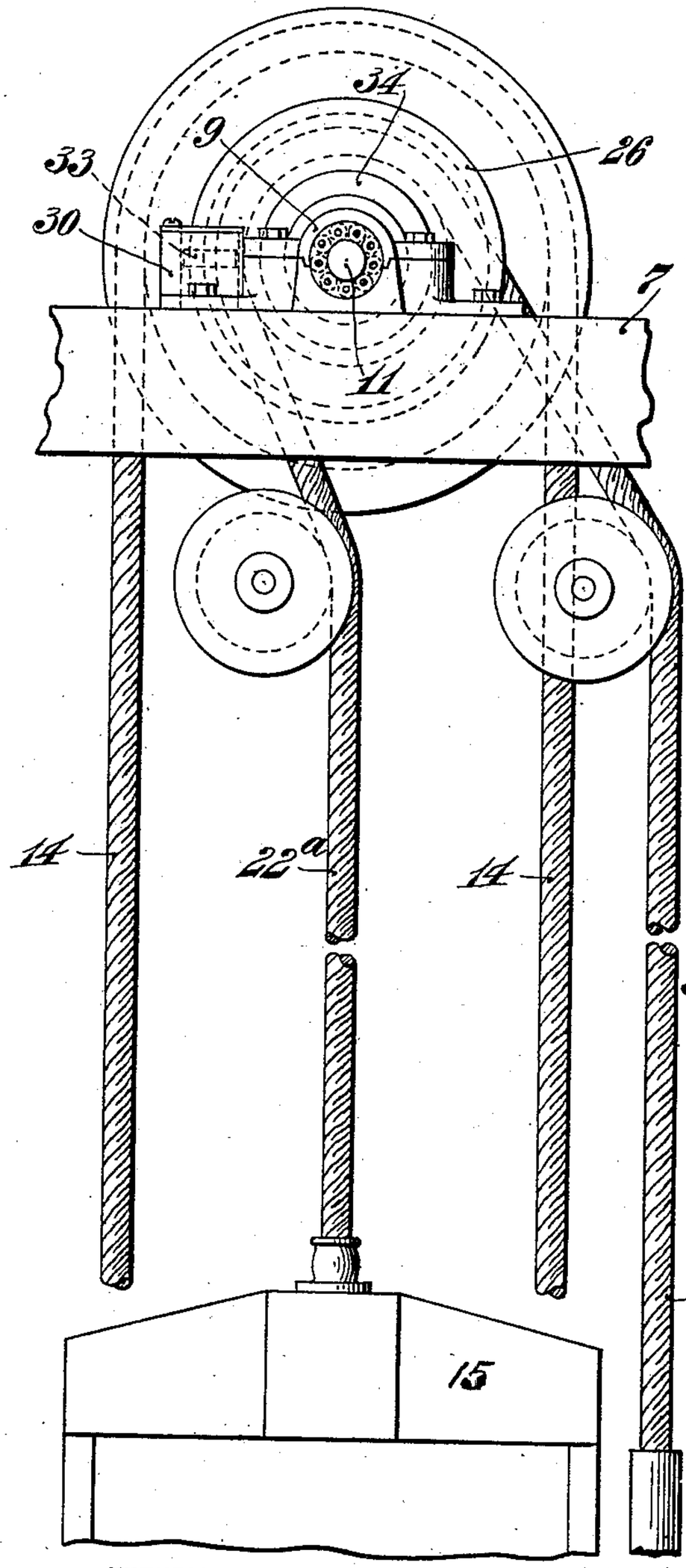


Fig. 2.

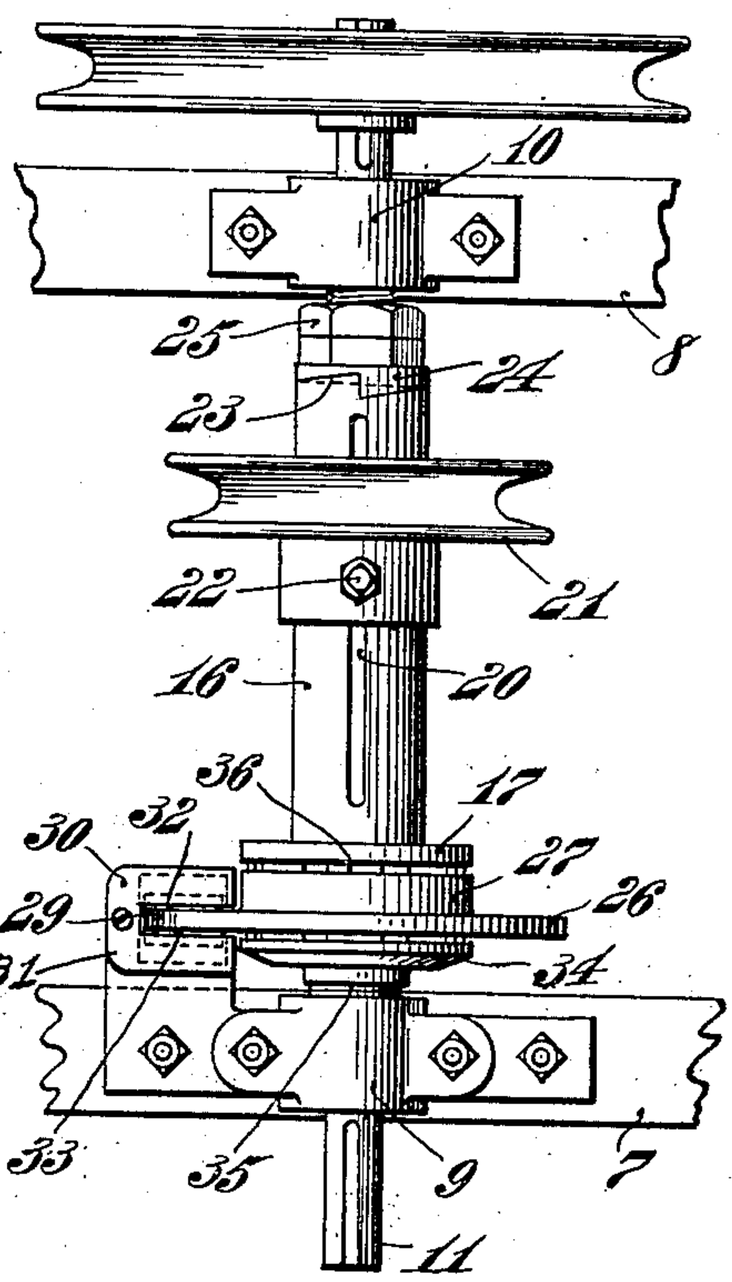


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Fig. 3.

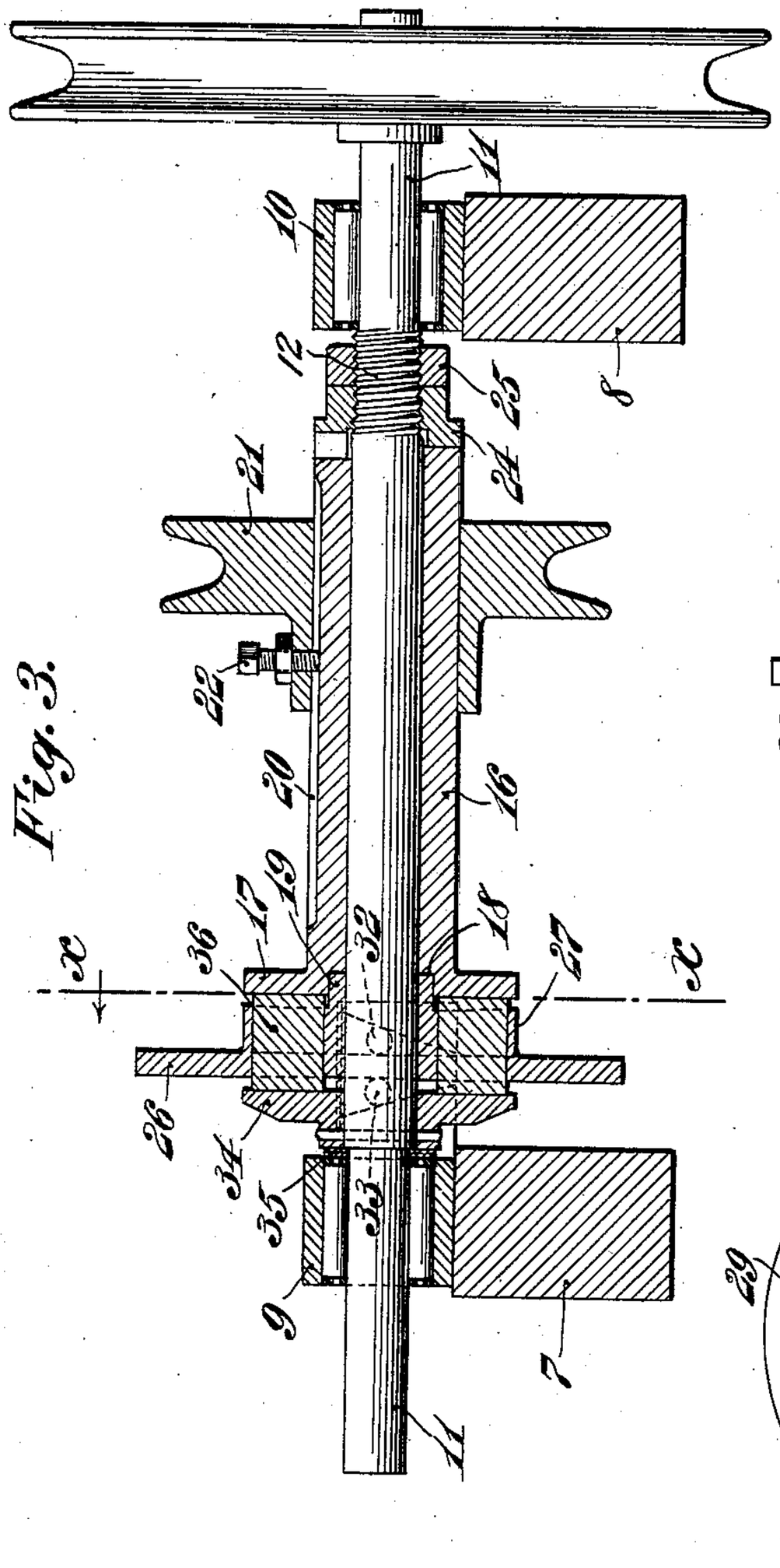



Fig. 6.

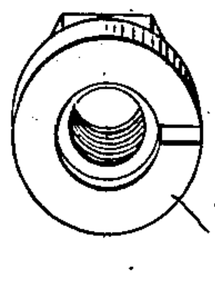



Fig. 5.

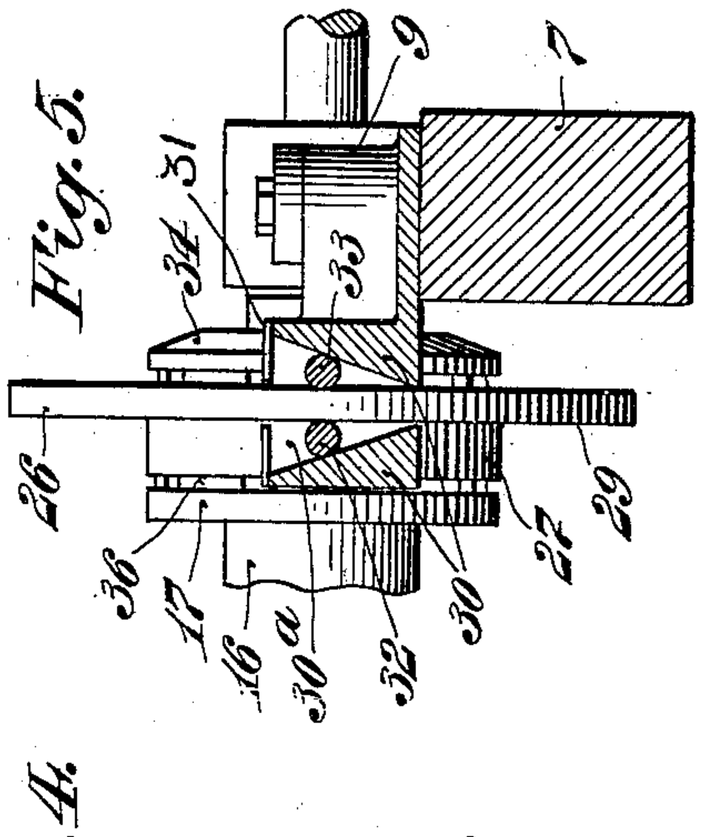
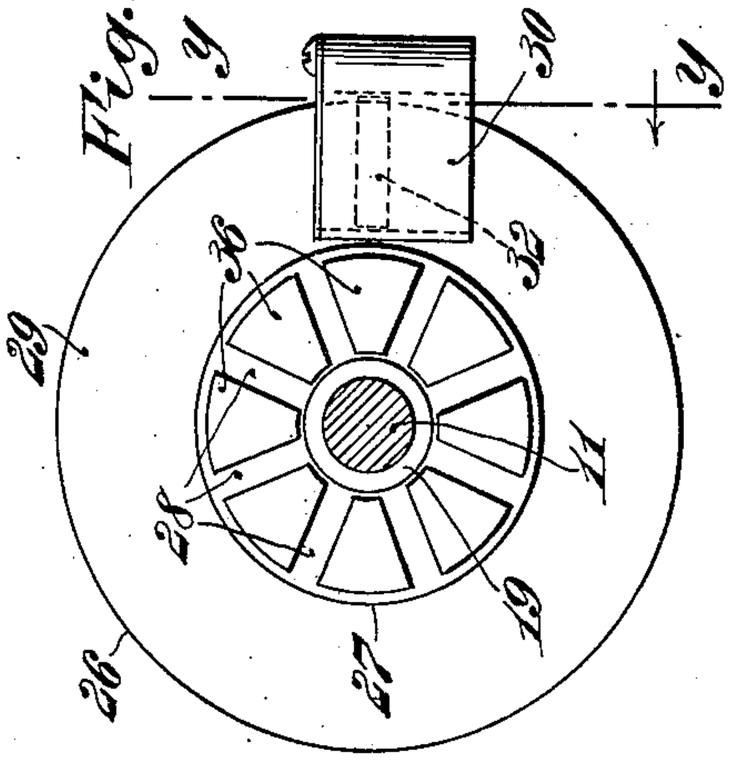



Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC FRICTION-BRAKE MECHANISM FOR ELEVATORS OR HOISTS.

No. 903,805. Specification of Letters Patent. Patented Nov. 10, 1908.

Application filed July 3, 1908. Serial No. 441,788.

*To all whom it may concern:*

Be it known that I, ADOLPH G. WUEST, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Friction-Brake Mechanism for Elevators or Hoists, of which the following is a specification.

My invention has relation to an automatic friction brake actuating mechanism for elevators or hoists arranged so as to sustain the load the instant the elevator or hoist comes to a stop by the action of the operating mechanism and during any momentary tendency of the elevator or hoist to drop or sag in the shaft to thus positively insure the safe braking of a loaded elevator or hoist in any elevated position thereof, without the aid of the said operating mechanism.

The nature, characteristic features and scope of my present invention, due to constructive and coöperating arrangement in an elevator or hoist operating mechanism, will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, in which

Figure 1, is a front elevation, in broken section, of a supported elevator car or hoist and operating mechanism therefor, and with an automatic friction brake means shown in application thereto, for sustaining the load in any shifted elevated position of the elevator or hoist, embodying particular features of my present invention. Fig. 2, is a top or plan view of the elevator or hoist operating mechanism and automatic friction brake-means. Fig. 3, is a central longitudinal section through elevator or hoist supporting and operating mechanism and automatic friction brake-means for sustaining a load, and in elevation, the operating horizontal shaft, with the sheave wheel for the operating cable of the elevator or hoist. Fig. 4, is a vertical cross-sectional view on the line $x$, $x$, of Fig. 3. Fig. 5, is a similar view on the line $y$, $y$, of Fig. 4; and Fig. 6, is a perspective view of the sleeve cam-shape end jam nut threaded to the operating horizontal shaft of said mechanism and adapted to lock with the cam-shape end of the sleeve carried by said shaft and carrying also the friction brake-wheel of said mechanism.

Referring to the drawings 7 and 8, are beams carrying cylindrical roller bearings 9 and 10, wherein is mounted a horizontal shaft 11, partially threaded at 12. On one end of the shaft 11, is mounted a grooved pulley or sheave wheel over which an endless hand operating cable 14, passes for controlling the raising and lowering of the hoist or elevator car 15.

16, is a sleeve mounted on the shaft 11, and provided at one end with a flange 17, interiorly recessed at 18, for receiving an extension 19, of the hub of a friction brake-wheel, to be hereinafter more fully described. A portion of the exterior surface of the sleeve 16, is grooved at 20, for mounting a sheave wheel or grooved pulley 21, thereon by means of a set screw 22, for shifting the same on the said sleeve. Over this pulley or wheel passes the counterbalanced cable $22^a$, supporting the car or hoist. At the opposite end of the sleeve the same is offset to form a cam shape end 23, to engage a complementally shaped end of a jam-nut 24, threaded to the shaft 11. Any shifting movement of the sleeve 16, on the said shaft 11, is prevented by a jam-nut 25, in contact with the nut 24, on the threaded portion of said shaft, as illustrated in Fig. 2. Beyond the flange 17, of the sleeve 16, on the shaft 11, is mounted a friction brake-wheel 26, by the hub 27, thereof, having the extension 19, to fit the end recess 18, of said sleeve. The wheel 26, is provided with spokes 28, and beyond with a wide solid rim or surface 29, as clearly illustrated in Fig. 4.

Preferably integral with one of the roller bearings 9, for the shaft 11, is formed a right angular arm with a conical shape slotted box 30, having a V-shape interior $30^a$, and a removable cap 31, as clearly illustrated in Fig. 5. In this box lengthwise thereof are mounted two long rollers 32 and 33, arranged to bear against the sides of the wide solid rim or surface of the brake-wheel 26, as clearly shown in Figs. 2, 3 and 5. Beyond the wheel 26, on the shaft 11, is rigidly mounted a circular bearing plate 34, as illustrated in Figs. 2 and 3, and between this plate and the inner end of the roller bearing 7, is interposed a washer 35, as illustrated in Fig. 3. Between the spokes of the friction brake wheel 26, are inserted wooden plugs or wedges 36, having the ends respectively, bearing against the bearing plate 34, and

flange 29 of said sleeve 16, as clearly illustrated in Fig. 3. By this arrangement the brake wheel 26, is not only solidly wedged to position against possible shifting movement on the shaft, but the area of straining support to the wheel from the shaft to the working surface thereof is largely increased. This prevents possible breakage of the wheel between the hub and solid portions due to faulty casting and this is quite important owing to the strain to which this is subjected, when becoming operative to effect in conjunction with the movable rollers 32 and 33, the sustaining load of the elevator car or hoist, while momentarily tending to drop or sag the instant brought to a stop through the operation of said elevator or hoist actuating mechanism, as explained. The said friction brake wheel 26, will absolutely prevent such action due to the positive frictional contact it has with the two rollers of the box 30, in any reverse movement of the shaft to that which raised the car or hoist, thus jamming the respective rollers 32 and 33, against the V-shaped interior surfaces of the said box, as will be clearly understood from Fig. 5, of the drawings.

Any wear of the sleeve and flange thereof, on the shaft 11, in contact with the brake-wheel 26, can be fully and quickly compensated for, by simply turning, by means of a wrench the nut 25, to tighten or clutch the cam ends of the sleeve and nut 24, against each other and hence to bring the flange of the sleeve again firmly against the wedges interposed between the spokes of the brake-wheel 26, and bearing-plate 34, on the shaft 11, located beyond the said wheel 26, as will be clearly understood from Figs. 2 and 3.

In the operation of the elevator or car, the instant it is brought to a stop in raising, and at that moment if there is a tendency of the car or elevator to slightly sag or drop the brake-wheel 26, will engage and jam the rollers in the slotted V-shape box 30, to hold firmly or securely the load until the car or hoist is again started up, when the brake-wheel 26, will again travel freely in an opposite direction in the slotted box 30, free of the respective rollers 32 and 33, thereof.

Having thus described the nature and objects of my invention, what I claim as new and desire to secure by Letters Patent is:

1. An automatic friction brake mechanism of the character described, comprising a horizontally supported rotatable shaft, a slotted box with a contracted interior, a brake-wheel mounted on said shaft and adapted to travel between rollers of said slotted box, a sleeve securely clutched to said shaft and provided with an end flange, a bearing-plate secured to said shaft beyond said brake-wheel and wedging means interposed between the hub and working surface of said brake-wheel with said sleeve and bearing-plate of said shaft, substantially as and for the purposes described.

2. An automatic friction brake mechanism of the character described, comprising a horizontally supported rotatable shaft mounted in roller-bearings and in an extension of one formed into a slotted box having a V-shape interior, a brake-wheel with a hub, spokes and with a solid working surface adapted to pass through the slot of said box and to engage rollers therein, the spokes on said brake-wheel by means of wedges held securely by a clutched sleeve to said shaft, said shaft carrying the cable operating sheave pulley, and said sleeve the elevator or hoist cable supporting sheave pulley, substantially as and for the purposes described.

3. An automatic friction brake mechanism of the character described, comprising a horizontally supported rotatable shaft mounted in roller-bearings and in an extension at a right angle to said shaft formed into a V-shape slotted box having rollers mounted therein, a brake-wheel having a hub mounted on said shaft and provided with spokes and a solid working surface for said rollers to bear against and be jammed by friction in a certain direction of rotation of said shaft, a sleeve clutched to said shaft by a jam-nut threaded thereto, a bearing-plate secured to said shaft beyond said brake-wheel, and wedging means interposed between the spokes of said brake-wheel with said sleeve and bearing-plate, substantially as and for the purposes described.

4. An automatic friction brake mechanism of the character described, comprising a rotatable shaft mounted in roller-bearings, a sleeve clutched to said shaft and carrying a pulley for the supporting cable of the elevator or hoist, a brake-wheel mounted on said shaft and wedged by said sleeve to position, a slotted tapering box connected with one of said bearings and through which box said brake wheel rotates in one direction of said shaft, rollers in said box bearing by gravity against both surfaces of said brake-wheel and frictionally engaging by rotation of said shaft in an opposite direction and said shaft carrying a sheave-wheel for the hand operating cable, substantially as and for the purposes described.

5. An automatic friction brake mechanism of the character described, comprising a horizontally supported rotatable shaft, a slotted box with an interior of greater diameter at one end than at the other, a brake-wheel mounted on said shaft and provided with spokes and wide working surfaces, said wheel adapted to travel between roller-bearing means provided in said slotted box and movably arranged therein, a sleeve securely clutched to said shaft and provided with an end flange, a bearing-plate secured to said shaft beyond said brake-wheel and wedging

blocks interposed between the spokes of said brake-wheel, and the ends thereof respectively, bearing against the flange of said sleeve and bearing-plate of said shaft, substantially as and for the purposes described.

6. An automatic friction brake mechanism of the character described, comprising a horizontally supported rotatable shaft mounted in roller-bearings, a sleeve clutched to said shaft, a brake-wheel mounted on said shaft and between the hub and working surface of the same provided with spokes, detachable wedges interposed between the spokes of said wheel, a bearing-plate mounted on said shaft adjacent to said brake-wheel, a slotted tapering box connected with one of said bearings and through which box said brake-wheel rotates, in one direction of said shaft, detachable rollers mounted in said box and adapted to bear by gravity against both working surfaces of said brake-wheel and to be frictionally engaged by said wheel in a certain movement of said shaft, to instantly prevent rotation of said wheel, substantially as and for the purposes described.

7. An automatic friction brake mechanism of the character described, comprising a horizontally supported rotatable shaft, a slotted box with a V-shape interior, rollers detachably mounted in said box, a brake-wheel mounted on said shaft and adapted to travel between the rollers of said slotted box, a sleeve removably clutched to said shaft and provided with a flange, a bearing-plate secured to said shaft, beyond said brake-wheel, wedging blocks mounted in the body of said brake-wheel and bearing respectively, against said sleeve-flange and bearing-plate of said shaft, and means threaded to said shaft for taking up wear between said plate and sleeve flange, substantially as and for the purposes described.

In witness whereof, I have hereunto set my hand and affixed my seal in the presence of two subscribing witnesses.

ADOLPH G. WUEST.

Witnesses:
J. WALTER DOUGLASS,
THOMAS M. SMITH.