

No. 696,221.

Patented Mar. 25, 1902.

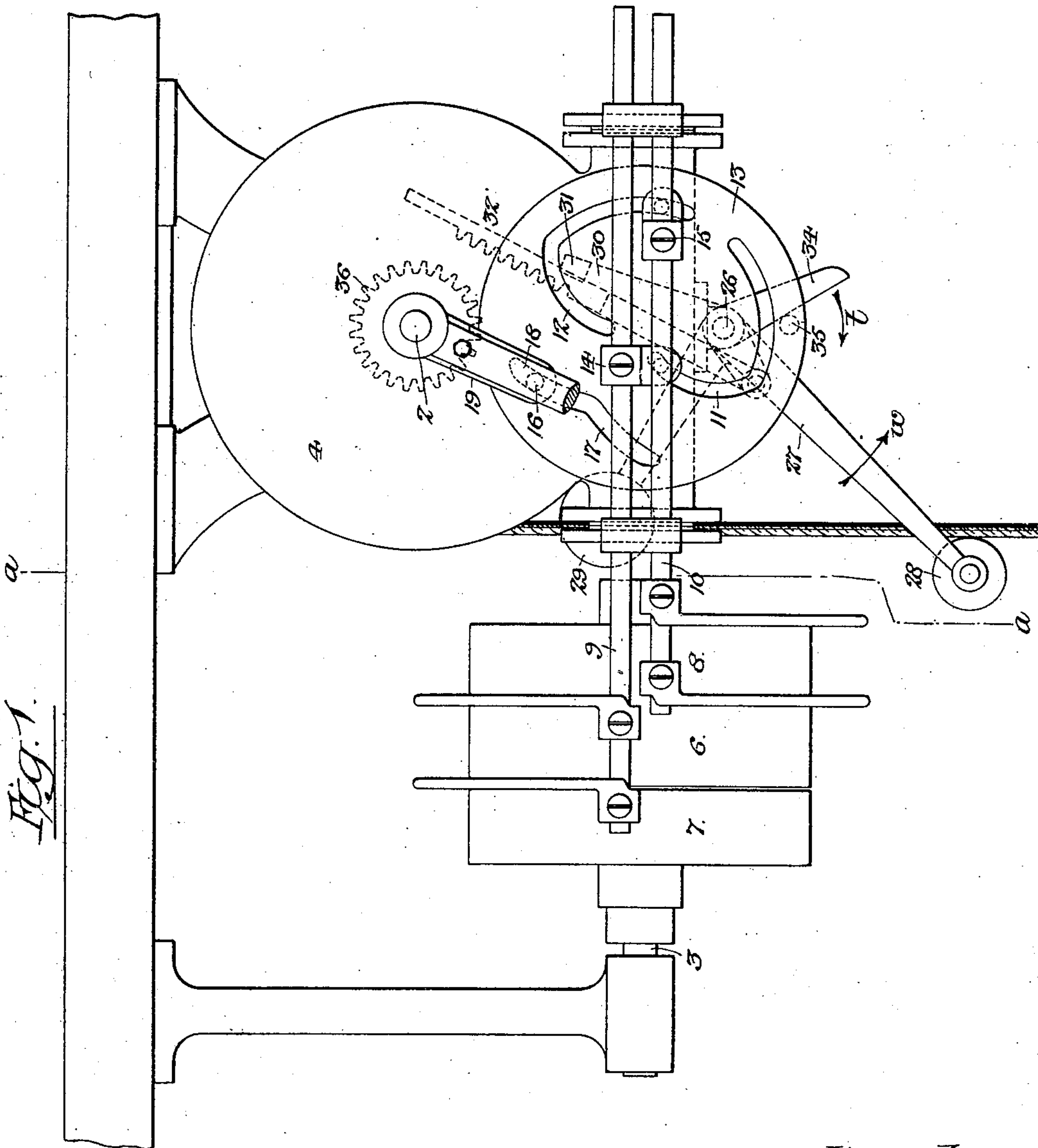
G. E. ANDERSON.

AUTOMATIC SLACK CABLE STOP MECHANISM FOR POWER ELEVATORS.

(Application filed Jan. 14, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:-

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Louis M. Whitehead

Inventor:-

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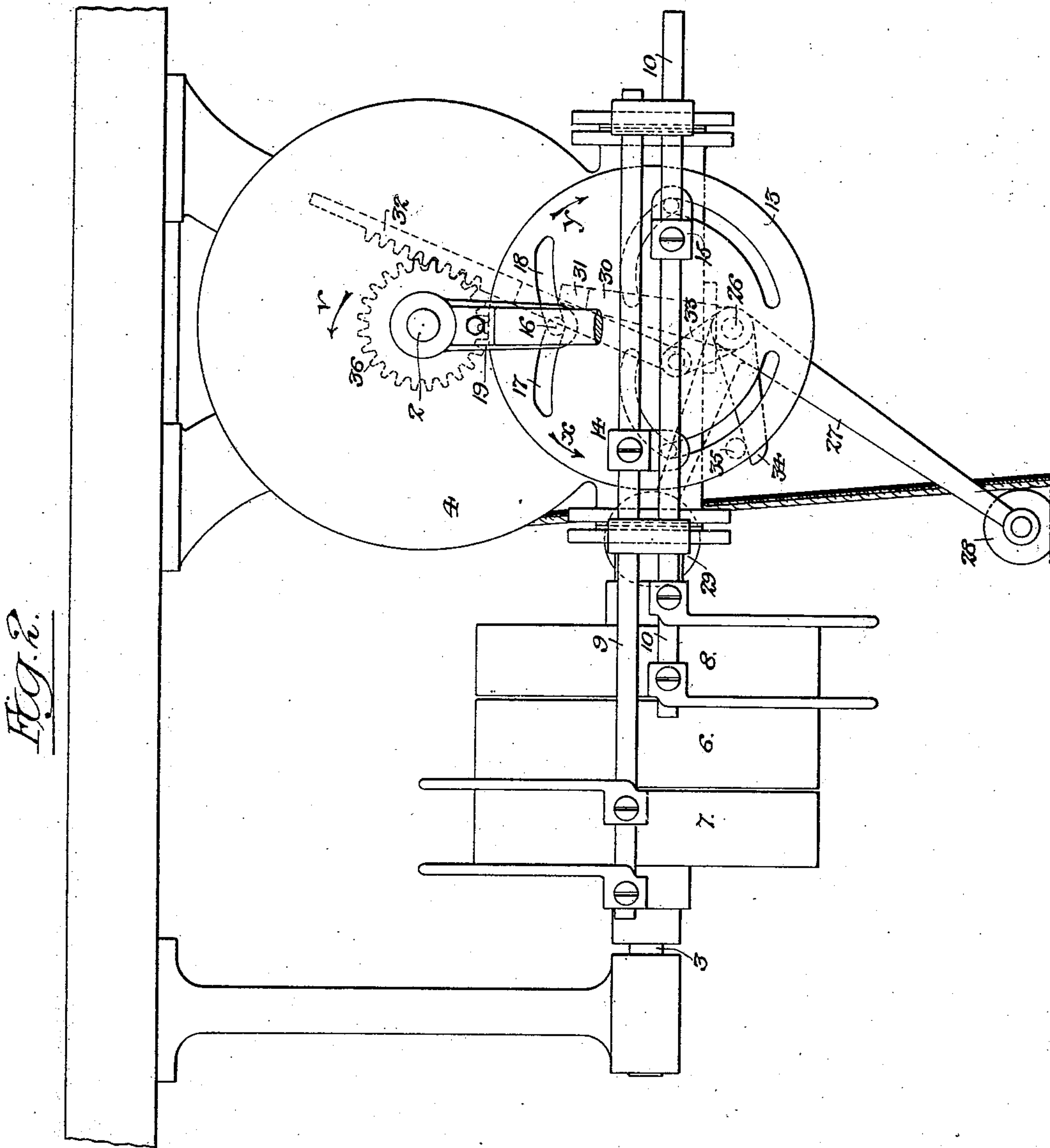
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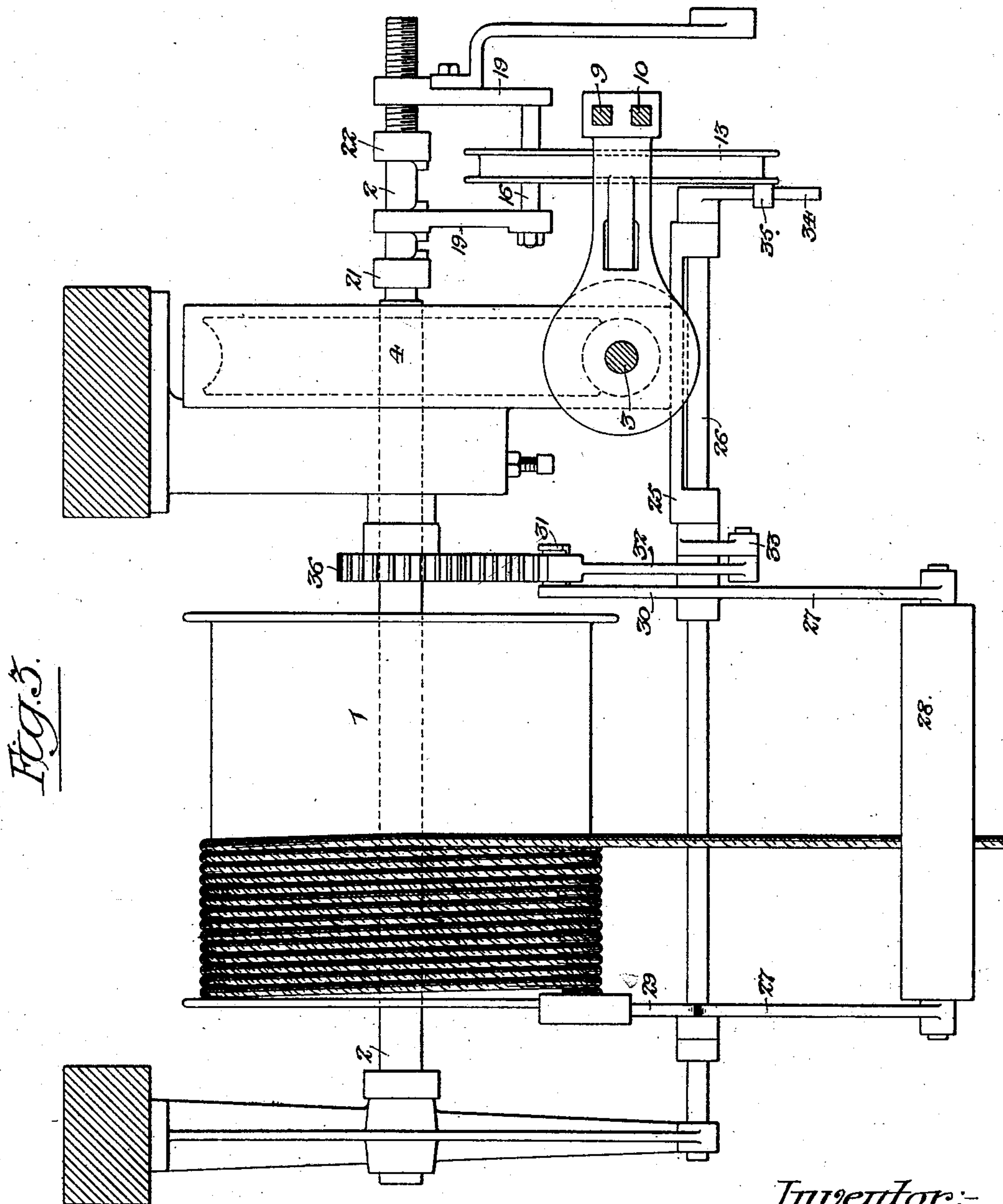
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UNITED STATES PATENT OFFICE.

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AUTOMATIC SLACK-CABLE STOP MECHANISM FOR POWER-ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 696,221, dated March 25, 1902.

Application filed January 14, 1901. Serial No. 43,209. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVE E. ANDERSON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Automatic Slack-Cable Stop Mechanism for Power-Elevators, of which the following is a specification.

The object of my invention is to arrest the unwinding of the cable from the hoisting-drum of a power-elevator when the descent of the car is arrested from any cause, thereby precluding such accumulation of slack rope as would permit the car to fall if the obstruction was but temporary.

In the accompanying drawings I have illustrated my invention as applied to a common form of belt-actuated power-elevator; but it should be understood that the invention is not limited to the particular form of elevator shown, but is applicable to others of the class, as well as to those which are directly actuated by means of a steam, air, or other engine, the belt-shifter being in such cases replaced by a valve-controlling device.

In the drawings, Figure 1 is a side view of the elevator mechanism with my improved automatic slack-cable-actuated stopping device applied thereto, this view showing the parts in position for lowering the car. Fig. 2 is a similar view showing the parts adjusted for stopping the power mechanism when the cable is slack; and Fig. 3 is a section on the line *a a*, Fig. 1.

The hoisting-drum of the elevator is represented at 1, this drum being carried by a shaft 2, which is driven from the primary power-shaft 3 through the medium of the usual worm-gearing contained in the casing 4, the shaft 3 having a fast pulley 6, a right-hand-running loose pulley 7, and a left-hand-running loose pulley 8, each intended to receive a belt from an adjoining power-shaft. The two belts are controlled by fingers on a pair of shipper-bars 9 and 10, suitably guided in brackets on the casing 4, said shipper-bars being under control of cam-slots 11 and 12 in a disk 13, which is suitably connected to the controlling and reversing mechanism on the car.

The cam-slot 11 controls a pin on a bracket 14 on the shipper-bar 9 and the cam-slot 12 controls a pin on a bracket 15 on the shipper-bar 10, and when the disk 13 is in the position shown in Fig. 2 the driving-belts are respectively on the loose pulleys 7 and 8 and the hoist is at rest. By turning the disk in the direction of the arrow *x*, however, the shipper-bar 9 will be operated so as to shift the belt from the pulley 7 onto the pulley 6, as shown in Fig. 1, thereby turning the latter and the shaft 3 so as to impart such movement to the drum 1 as to unwind the cable therefrom and lower the car, and by turning the disk 13 in the direction of the arrow *y*, Fig. 2, from the position shown in said figure the cam-slot 12 will operate the shipper-bar 10 so as to shift the belt from the loose pulley 8 onto the fast pulley 6, and thereby operate the drum 1 so as to wind up the rope and raise the car.

Movement of the disk 13 is effected by means of suitable chain or rope connections with an operating device on the car, and when in either of its extreme positions it can be restored to intermediate position automatically by a pin 16 engaging with cam-slots 17 and 18 in said disk, the pin being carried by a swinging yoke 19, depending from the shaft 2, and swung to right or left by means of tappets 21 and 22 on the shaft 2, one of the legs of the yoke being brought into engagement with one of these tappets when the car has reached the limit of its upward movement and with the other of said tappets when the car has reached the limit of its descent, longitudinal movement of the yoke necessary to effect such operation being caused by engagement of the internally-threaded portion of the other leg of the yoke with a threaded portion of the shaft 2. All of these parts, however, are common in this type of elevator and constitute no part of the device which I have invented, the latter being supplementary thereto and being intended for effecting automatic movement of the cam-disk 13 when the descent of the cage is obstructed and when under ordinary circumstances the drum would go on unwinding slack rope, which

would permit a sudden drop of the cage when the temporary obstruction to its movement was overcome.

My safety attachment is as follows: To a
 5 suitable bearing 25, secured to and depending from the casing 4 and to a depending portion of one of the bearings for the shaft 2, is adapted a rock-shaft 26, upon which is loosely pivoted a frame 27, and in the latter is mounted
 10 a roller 28, which bears upon the cable after the latter leaves the drum 1, a weighted arm 29 on the frame 27 serving to maintain the roller 28 constantly in contact with the said cable and causing it to yield or move in
 15 the direction of the arrow *w*, Fig. 1, as soon as there is any slack in the cable. On the frame 27 is another arm 30, which has a projecting finger 31, serving as a support for a rack-bar 32, the latter being hung to an arm
 20 33, which is secured to the rock-shaft 26, said shaft having another arm 34, which is adapted to act upon a pin 35, projecting from the back of the cam-disk 13. Secured to the shaft 2 is a spur-wheel 36, with which the rack-bar 32
 25 can be brought into mesh when said bar is raised. When the elevator-car is being lowered, the belt from the pulley 7 has been shifted onto the pulley 6, as shown in Fig. 1, and the pin 35 on the back of the cam-disk
 30 13 has been moved downward until it is in contact with the arm 34, and so long as the elevator is running properly in its descent the parts retain these relations, but should there be any obstruction to the descent of the
 35 elevator which would cause a slackening of the cable the frame 27 will at once swing downwardly and inwardly in the direction of the arrow *w*. Hence the arm 30 will raise the rack-bar 32 into engagement with the spur-
 40 wheel 36, and as said spur-wheel during the unwinding of the drum rotates in the direction of the arrow *v*, Fig. 2, there will be an upward pull upon the rack-bar 32, which will cause a swinging movement of the rock-
 45 shaft 26 and its arm 34 in the direction of the arrow *t*, Fig. 1, and said arm 34 will therefore act upon the pin 35 to restore it and the cam-disk 13 to the position shown in Fig. 2, thereby shifting the belt from the fast pulley
 50 6 back onto the loose pulley 7, so as to stop

the operation of the hoist. The lowering of the hoist cannot be resumed until the drum 1 has first been turned so as to again tighten the cable and permit the rack-bar 32 to move out of engagement with the spur-wheel 36, 55 whereupon the cam-disk 13 can be moved so as to cause the pin 35 to act upon the arm 34 to again restore the same to the position shown in Fig. 1 and draw down the rack-bar 32 into its normal position in respect to the spur- 60 wheel 36.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination in a slack-cable-actuated stop mechanism for the power-control- 65 ling device of a hoist, of belt-shippers, a cam-disk for controlling the same, a drum-shaft having a spur-wheel thereon, a rock-shaft having two arms, one for engaging with a projection on the cam-disk in order to move 70 the same to a mid or neutral position, and the other arm having a rack-bar pivoted thereto, a lever having two arms, one provided with a roller for bearing upon the cable and the other serving as a support for the 75 rack-bar, and means for constantly maintaining the roller in contact with the cable, substantially as specified.

2. The combination of the power-controlling device of a hoist, with a slack-cable-actu- 80 ated stop mechanism therefor comprising a toothed wheel on the drum-shaft, a rock-shaft having an arm for acting on said power-controlling device, and another arm to which is pivoted a rack-bar, a carrier having a roller 85 for bearing upon the cable, means for maintaining said roller in contact with the cable, and a connection between said roller-carrier and the rack-bar whereby, when the cable is 90 slack, the rack-bar is pushed positively into engagement with the toothed wheel on the drum-shaft, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GUSTAVE E. ANDERSON.

Witnesses:

FRANK E. BECHTOLD,
 JOS. H. KLEIN.