

923,847.

2 SHEETS—SHEET 1.

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ELEVATOR GATE OPERATING MECHANISM.
APPLICATION FILED SEPT. 28, 1908.

923,847.

Patented June 8, 1909.

2 SHEETS—SHEET 2.

Fig. 5.

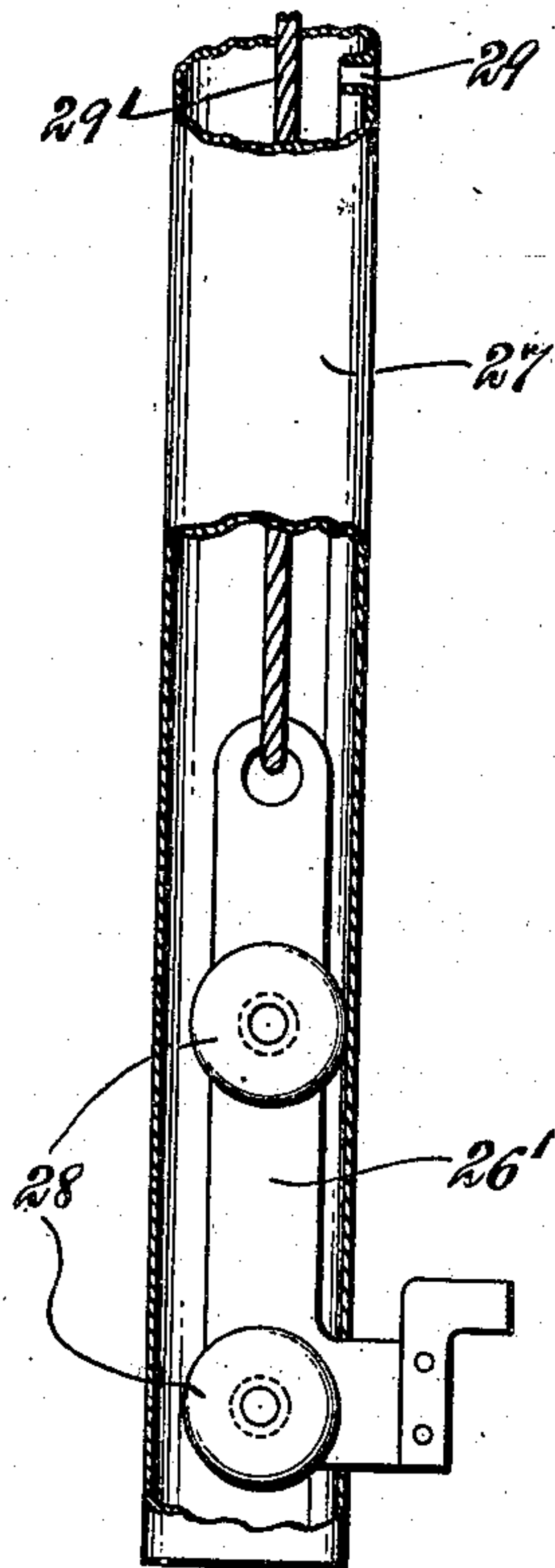


Fig. 3.

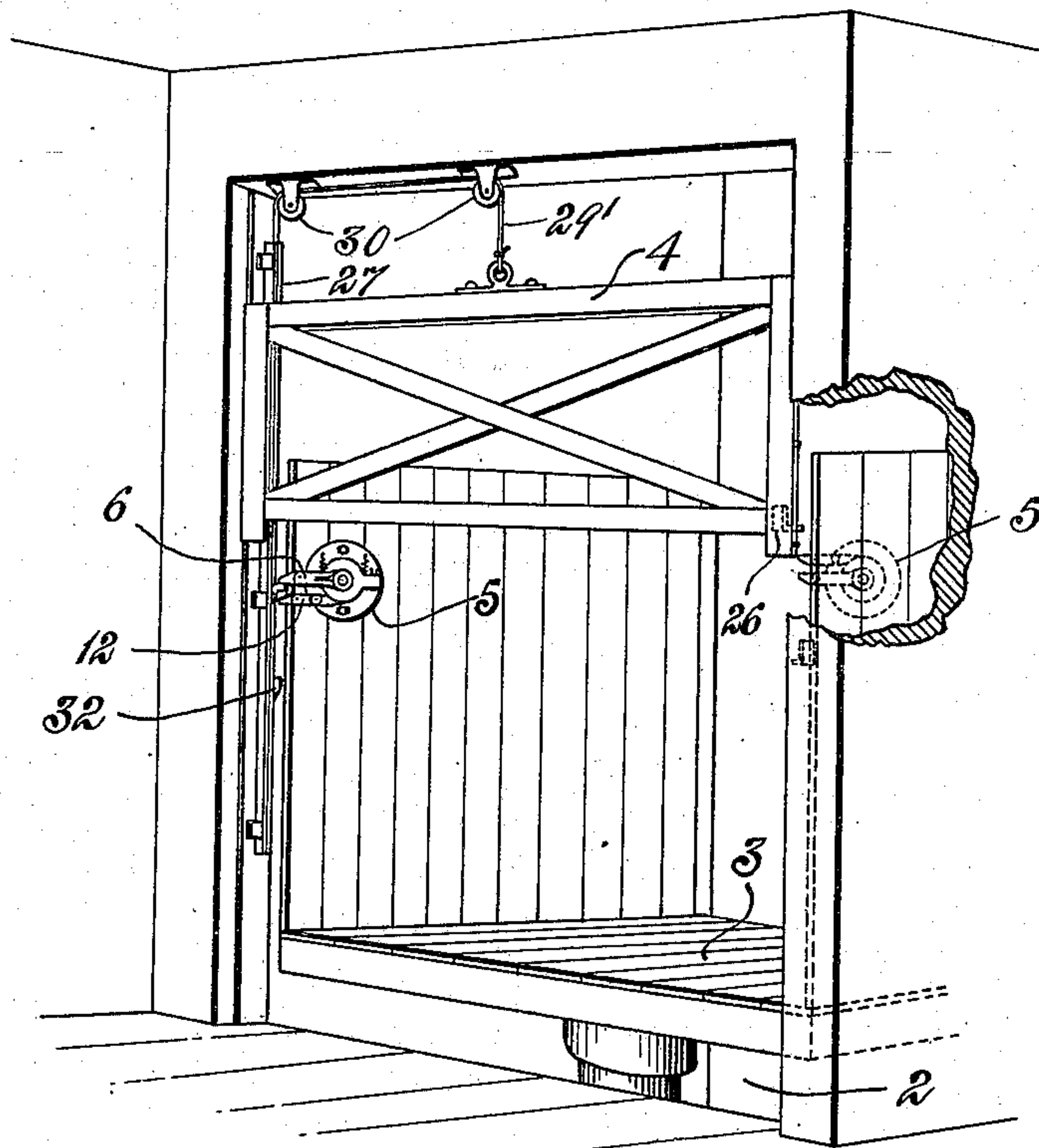


Fig. 6.

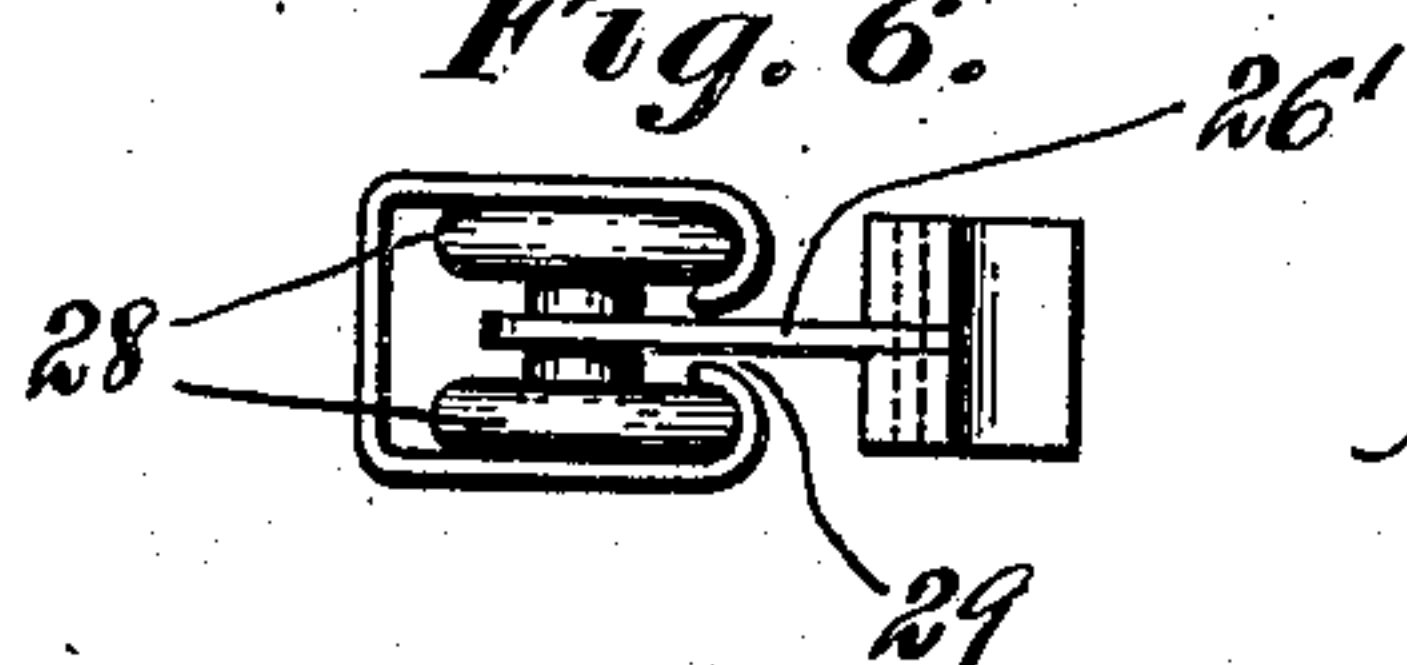
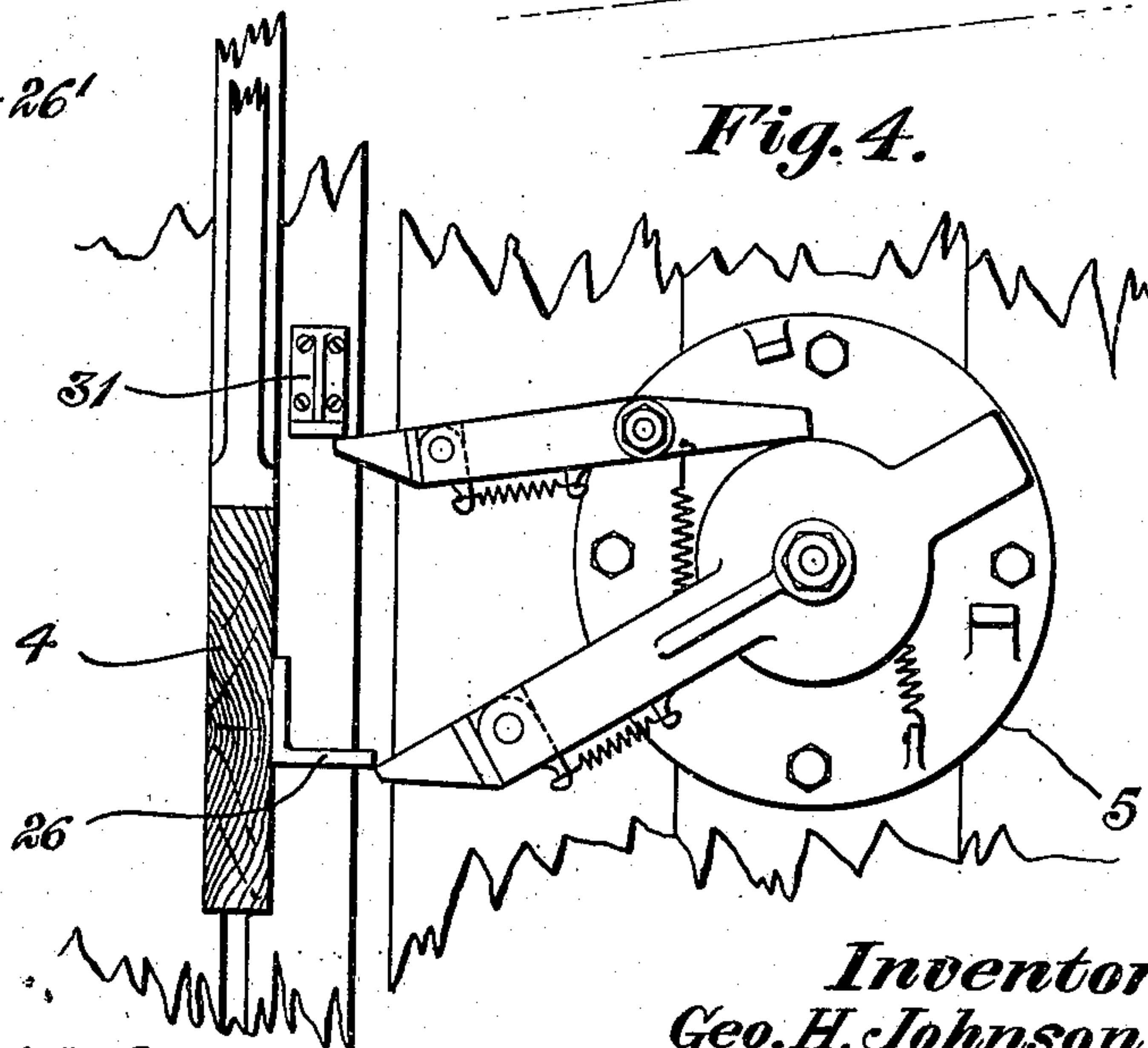


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ELEVATOR-GATE-OPERATING MECHANISM.

No. 923,847.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed September 28, 1908. Serial No. 455,063.

To all whom it may concern:

Be it known that I, GEORGE H. JOHNSON, a citizen of the United States, residing at Pittsfield, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Elevator-Gate-Operating Mechanism, of which the following is a specification.

This invention relates to elevator gate operating mechanism the object of the invention being to provide simple and effective means for opening a hatch-way or elevator well gate during the movement of the car or traveling platform. In the present instance the means is of such a character that the gate is automatically opened both on the ascent and descent of said car.

In the drawings accompanying and forming part of the present specification I have illustrated in detail one advantageous form of embodiment of the invention which to enable those skilled in the art to practice said invention will be set forth in full in the following description while the novelty of the invention will be included in the claims succeeding said description.

Referring to said drawings, Figure 1 is a top plan view of a carrier, an actuator thereon, a latch and certain adjunctive devices. Fig. 2 is an elevation of the parts illustrated in the preceding view. Fig. 3 is a perspective view of an elevator equipped with gate operating mechanism involving my invention, a portion of the casing in said figure being removed to more clearly illustrate certain of the elements. Fig. 4 is a sectional elevation of portions of the well, gate, and car furnished with the operating mechanism. Fig. 5 is a sectional elevation of a tube or guide, a traveler therein, and a piece of the connecting cord, and, Fig. 6 is a bottom plan view of the same.

Like characters refer to like parts throughout the several figures.

In Fig. 3 of the drawings I have partially illustrated an elevator of familiar construction, the same comprising a well or hatch-way 2 and a car as 3 which travels in said well. The opening at a floor or landing, leading into said well and by which access may be had to the car is governed by a gate as 4 and it is such a gate as this that my operating mechanism will open.

The parts to which I have referred are

quite common and therefore it is wholly unnecessary to describe the same in detail.

It might be stated that it does not concern my invention what the type of gate may be; that represented is vertically slidable. When closed the gate rests approximately on the floor, it being illustrated as open in said Fig. 3.

In the form of the device represented in the drawings there are what I term two "carriers", each carrier being adapted to shiftably support an actuator or gate opener and certain coöperating parts. The number of these carriers, however, is not a part of the invention although in the present case I prefer to employ two, the members sustained by one of them being effective during the ascent of the car while the corresponding parts on the other are operative during the descent of the car. If I describe in detail one of the carriers and the devices supported by it this will apply to the other carrier and the parts thereon. It will hereinafter be evident that a carrier with the various devices thereon presents an article of manufacture which can be handled and sold as such. It can be readily attached to cars of various kinds now in everyday use.

I will refer in detail to Figs. 1 and 2 which shows that carrier which supports the ascending gate actuator. This carrier may be of any desirable nature; a substantially flat plate as 5 satisfactorily answers my purpose. The shape of the plate is not a matter of any consequence although it is represented as being circular. In like manner the gate opener or actuator supported by said carrier or plate 5 may be of any suitable kind; I find a lever as 6 as very desirable, said lever as will hereinafter appear having a swinging movement about an axis between the ends thereof. On the inner side of the lever 6 I have shown a hub as 7 which fits against an outwardly-extending central hub as 8 on the carrier or plate 5, a pivot as 9 extending through the two hubs. The pivot 9 is shown as a bolt and the rear reduced portion is passed through the hub 8 and is preferably headed in a countersink in the rear face of the carrier or plate 5 by reason of which no protrusions are present on said face. Said pivot or bolt extends through a hub as at 10 at the front of the lever 6 and is provided with a nut as 11 to hold the lever in place.

The forward branch or arm of the lever 6 extends from said front hub 10 by reason of which said branch or arm will be in a different plane vertically from the controlling device for said lever said controlling device being shown as a latch 12. The latch 12 is pivotally connected to the carrier or plate 5 by a bolt as 13 mounted practically like the bolt 9. The pivot for said latch is therefore situated between the ends thereof. It will be perceived that the gate opening lever 6 and holding latch 12 therefor swing about parallel axes and that their motion is in parallelism with the carrier or plate 5 thereby securing a simple and compact structure. They both extend from said carrier so as to readily perform their functions. Said latch 12 serves as a simple means for normally holding the lever 6 against movement and for this purpose it engages against a shoulder or stop face as 14 on the hub 7 of said lever. It might be stated that the said shoulder or stop face is one end of a circular groove 15 in said hub 7. It will be perceived that the thrust of the lever 6 is substantially perpendicular to the axis of motion of the latch 12 whereby the best possible effect is obtained.

Normally the tail portion or inner branch of the lever 6 rests on a stop as 16 which may consist of a projection or lug on said carrier or plate 5, this relation being preferably maintained by a spring as 17. The spring is shown as being connected with the tail portion of said lever and with an ear as 18 on said plate 5 below the lever and it is of the "pull" type to obtain the function mentioned. The spring it might be also added also returns the lever to its normal position after the latter has been shifted. The latch 12 is also preferably normally positively held in its effective or locking position and for this purpose a spring as 19 may be utilized. This spring is also of pull form, one end thereof being connected with the tail of the latch while the other is united to a lug as 20 on the carrier or plate 5. Normally the inner end of the latch bears against the shoulder or stop face 14 whereby shifting movement of the lever 6 is prevented. When the latch is tripped or disengaged from said shoulder or stop face the lever will be freed and may be shifted. When the lever is released after being thus shifted it is instantly returned to its original position by the spring 17 and when said lever has practically reached said original position with the tail thereof against the stop 16 the latch 12 will be snapped to its primary position by the spring 19 so as to again lock said lever.

At the free end of the lever 6 is supported a by-pass device as 21 which is shown as a finger pivoted to said lever. I term said part 21 a by-pass device owing to the fact

that when it exerts a thrust in one direction it is effective while when it strikes against an object from the opposite direction it is ineffective and it passes by said object without accomplishing anything. The latch 12 has at its free end a similar by-pass device or finger as 22. The by-pass devices 21 and 22 are effective during the ascent of the elevator. At this point it might be well to state that I have described in detail the carrier shown in Figs. 1 and 2 which supports the parts which operate during the ascent of the elevator-car but which are not operative during the descent thereof. The same carrier is also shown in Fig. 4 but in Fig. 3 I have shown two carriers the one in full lines being that which supports the parts which operate on the descent of the car and not on the ascent thereof.

The two carriers and the parts supported thereby are identical in construction and operation although when applied to the two opposite sides of the elevator-car the by-pass devices on one will face oppositely to those on the other.

I will again refer to Figs. 1 and 2. The by-pass device or pivoted finger 21 is mounted between the sides of a bifurcation at the forward end of the lever 6, a pivot 23 being shown for holding the same in place. The inner side of said by-pass device 21 has the lower portion squared off to engage against the vertically straight rear wall of said bifurcation while the upper portion of said by-pass device is rounded off. In view of this construction and mounting the by-pass device or finger 21 when it strikes an obstacle on the ascent of the elevator car will present in effect a rigid member at the working end of the lever 6 while the opposite will be the case on the descent of said car. The by-pass device 22 acts exactly similarly. The said by-pass devices are held in their working relations by springs as 24 and 25. All the moving parts therefore on the carrier 5 are yieldingly mounted or spring controlled. After either of said by-pass devices has been shifted it is returned to its initial position by its cooperating spring. As will hereinafter appear the lever 6 in itself is practically a by-pass device.

Particular attention is now invited to Figs. 3 to 6 inclusive. The gate opening lever which is active during the ascent of the car operates against a projection as 26 fastened directly to the gate 4 while the gate opening lever which is active during the descent of the car actuates a traveler as 26', the traveler and projection being so located as to open the gate 4 at the proper time during the descent and ascent of said car. The levers will operate against the respective cooperating parts until they are released by the tripping of their coacting latches. The traveler 26' is shown as situated in a tube or guide as

27 fastened at a suitable place on the elevator casing or wall of the elevator well and it has rollers or wheels as 28 to travel along the bent portions of said tube said bent portions being at opposite sides of the mouth of longitudinally-disposed slot 29 through which a portion of the traveler extends for engagement by the cooperating lever. To the upper end of the traveler a cord or band as 29' is shown as connected, said cord or band leading to and being connected with the gate 4 and passing over guide sheaves as 30, the bearings or boxes of which are fastened to the top of the door way or opening controlled by said gate. Above the projection 26 is a trip device as 31 fastened to some relatively fixed part as to the wall of the elevator well while below the traveler 26' is a substantially similar trip-device as 32.

It will be assumed that the elevator car has fastened thereto by screws or otherwise, the two carriers or plates 5 and that said car is ascending. Just before the car reaches the floor the lever 6 on the carrier 5 shown by dotted lines in Fig. 3 will engage the projection 26 and as said car continues to move upward the gate will be caused to rise or be opened, the motion of the car continuing until the gate is fully opened at which point the floor of the car will be level with the floor. It will be clear of course that the by-pass device 21 on said lever in question strikes the said projection. Should the car descend the gate 4 can close by its own weight. It will be assumed, however, that the car after having stopped ascends farther. After it has ascended a very slight distance the by-pass device or pivoted finger 22 which cooperates with the trip device will strike said trip device and on the continued ascent of the car 3 the latch 12 will be tripped thereby releasing the lever 6 and permitting the car to freely ascend. As soon as said lever is released its forward end will be swung downward and then freed from the projection 26. The moment said lever is free of said projection it will be promptly returned to its operative position by its spring 17 and afterward locked by the latch 12. It will be obvious that I have described the action which ensues on the ascent of the elevator. During the descent of the elevator the by-pass devices 21 and 22 perform no office merely striking the projection 26 and trip-device 31 and being swung around their centers thereby.

The lever 6 and latch 12 on the carrier 5 shown in full lines in Fig. 3 act during the descent of the car, the projecting portion of the traveler 26' being lowered as the car descends by the cooperating lever 6 which is subsequently released by the tripping of the coacting latch.

I have described in detail that form of device which I have selected for illustration

in the accompanying drawings so that those skilled in the art may easily practice the invention. I do not of course limit myself to the disclosure thus made for many variations may be adopted within the scope of my claims.

What I claim is:

1. Elevator gate operating mechanism comprising a plate, a gate opener consisting of a lever pivoted to said plate, and a latch also pivoted to the plate, for normally holding the lever against movement, the lever and latch having by-pass devices at the effective portions thereof.

2. An article of manufacture comprising a plate adapted for attachment to the car of an elevator, a gate-opening lever pivoted to said plate, and a latch also pivoted to the plate for engaging and normally holding the lever against movement.

3. An article of manufacture comprising a carrier adapted for attachment to the car of an elevator, a gate-opening lever pivoted to said carrier, a returning spring for the lever, connected therewith and also with said carrier, a latch for normally holding the said lever against movement, and a returning spring for the latch, connected therewith and with said carrier.

4. Elevator gate operating mechanism comprising a carrier adapted for attachment to the car of an elevator, a gate opening lever pivoted to said carrier and having a pivoted by-pass, spring-actuated finger at its working end, a latch for normally holding said lever against movement, pivoted to said carrier and also having a pivoted, by-pass, spring-actuated finger at its working end, and returning springs for the latch and lever connected respectively therewith and with said carrier.

5. Elevator gate operating mechanism comprising a carrier, a gate opening lever pivoted to said carrier, and a latch for normally holding the lever against movement, also pivoted to said carrier the latter consisting of a plate and the lever and latch being adapted to swing about parallel axes and in parallelism with said carrier.

6. Elevator gate operating mechanism comprising a pivotally mounted lever and a pivotally mounted latch for normally holding the lever against movement said parts moving about parallel axes and one of them being equipped with a by-pass device at the working end thereof.

7. Elevator gate operating mechanism comprising a carrier, a gate opening lever pivoted to said carrier, a returning spring for the lever connected with the latter and with the carrier, a pivoted latch carried by said carrier, and a returning spring for the latch connected to the latter and also to the carrier.

8. Elevator gate operating mechanism

comprising a carrier, a gate opening lever pivoted to said carrier and provided with a yieldable by-pass device at its working end, a latch for normally holding said lever
5 against movement, pivoted to said carrier and also having a by-pass device spring controlled at its working end, and returning springs connected with the lever and latch respectively and also with said carrier.

10 9. Elevator gate operating mechanism comprising a carrier adapted for attachment to a car, a gate opening lever pivoted to said carrier, a latch also pivoted to said carrier, for normally holding the lever against move-
15 ment, and a trip supported independently of the carrier for directly engaging and tripping said latch.

10. The combination of an elevator car, a gate opening lever supported by said car, a
20 latch for directly engaging and holding said lever against movement, and a trip supported independently of the car for directly engaging and tripping said latch on the motion of said car.

25 11. Elevator gate operating mechanism comprising a carrier adapted for attachment

to a car, a lever pivotally supported by said carrier, the latter being provided with a stop, a spring connected with the lever and also with the carrier for moving the lever
30 into engagement with said stop, a latch also pivoted to the carrier, a spring for returning said latch to a normal position said latch when in said normal position serving to prevent movement of said lever and said last
35 mentioned spring being connected with said carrier, and yieldable by-pass devices at the working ends of the lever and latch respectively.

12. Elevator gate operating mechanism 40 comprising a pivotally mounted gate opening lever the hub of which is provided with a groove one end of which constitutes a shoulder, and a movably mounted latch to engage said shoulder and thereby normally
45 prevent shifting of said lever.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE H. JOHNSON.

Witnesses:

LINCOLN G. ALEXANDER,
ROY D. MYERS.