

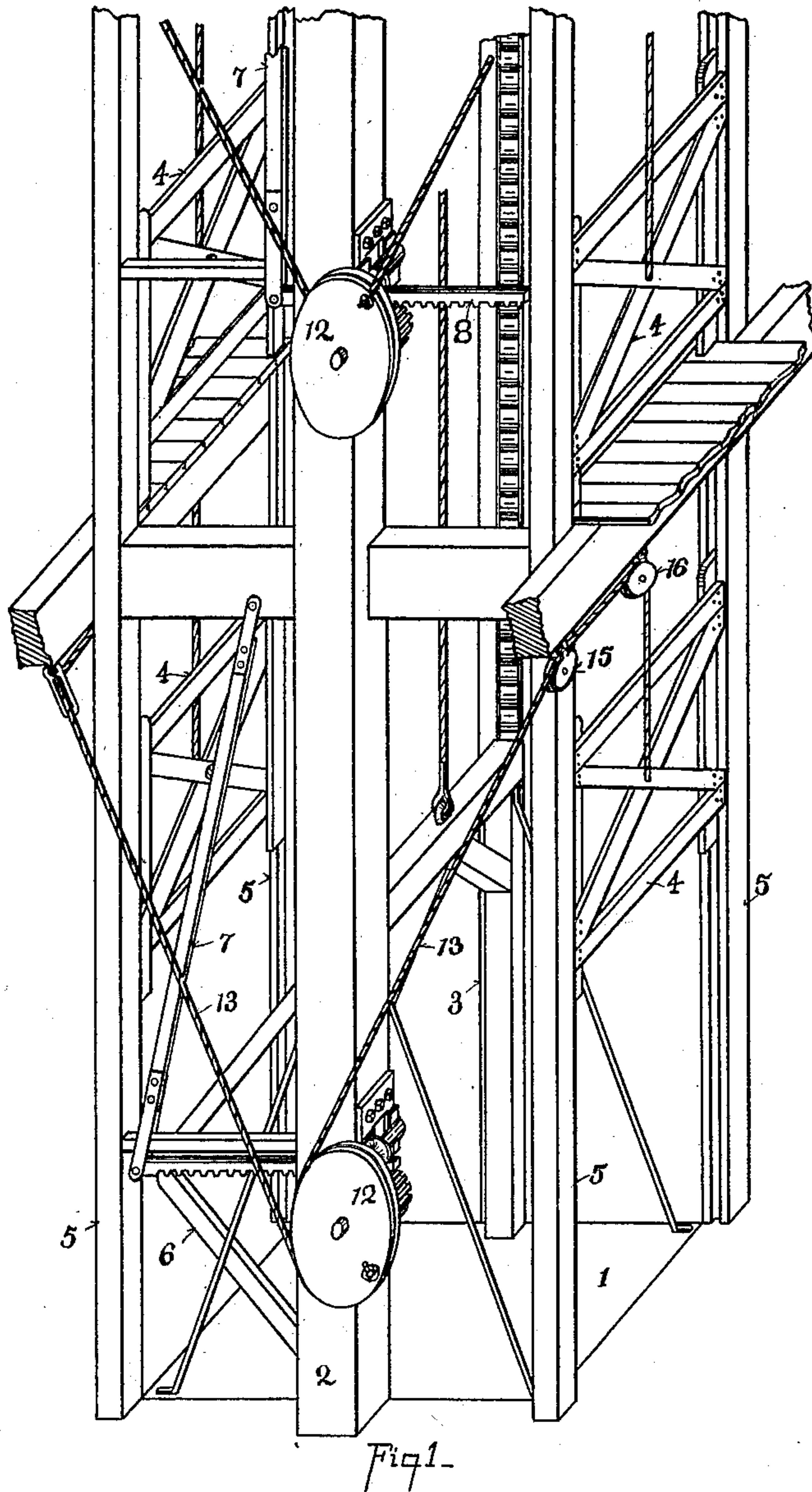
(No Model.)

2 Sheets—Sheet 1.

J. G. ZELLER.
ELEVATOR GATE.

No. 424,917.

Patented Apr. 1, 1890.



Witnesses

C. W. Miles
T. Simmons

Inventor

John G. Zeller
By his Attorneys *Wood & Byrd*

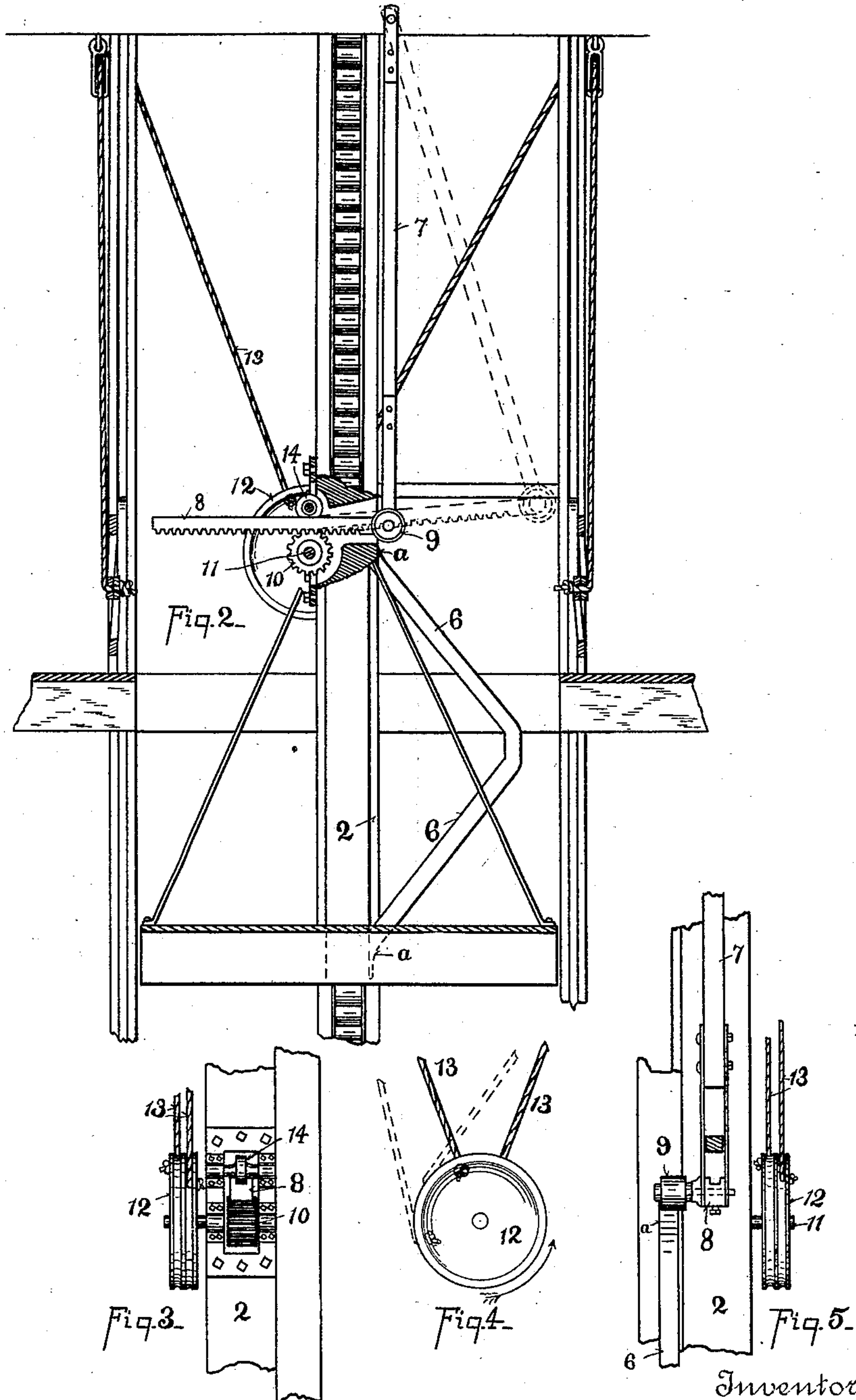
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UNITED STATES PATENT OFFICE.

JOHN G. ZELLER, OF RICHMOND, INDIANA.

ELEVATOR-GATE.

SPECIFICATION forming part of Letters Patent No. 424,917, dated April 1, 1890.

Application filed October 17, 1889. Serial No. 327,288. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. ZELLER, a citizen of the United States, and a resident of Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Automatic Elevator-Gates, of which the following is a specification.

My invention is an improvement in that class of elevators shown and described in Letters Patent No. 230,387, granted to G. Ackerman, dated July 27, 1880, and No. 231,388, dated August 24, 1881.

One of the objects of my invention is to take off the shocks and jars in the stopping and starting of the gates which work in the hatchway and are opened and closed automatically by the movement of the elevator.

Another object of my invention is to reduce the friction and secure a smooth working of the parts.

The various features of my invention are fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the elevator working in a hatchway containing my improvement. Fig. 2 is a side elevation, partly in section, showing the position of the parts when the gate is opened or closed. Fig. 3 is a detail side elevation of the drum, rack, and pinion. Fig. 4 is a side elevation showing the rope and drum attachments. Fig. 5 is a transverse side elevation of Fig. 3.

1 is the platform of the elevator; 2 3, the stanchion on which the drum and driving-gear to move the gates are mounted.

4 represents the gates for closing the hatchway, which move in the grooves of the corner-post 5, as shown in said former patent.

6 represents a double incline rigidly connected to the frame of the elevator.

7 represents a pendulous lever which is pivoted, preferably, within the hatchway, and at the floor above the one on which a given gate is to be opened or closed. The lower end of said lever is pivoted to the rack 8. It also carries a friction-roller 9, which comes in contact with and moves up and down the incline 6 as the elevator passes up or down to any given story in the hatchway. The rack 8 meshes with the teeth of gear 10, which is

geared to the shaft 11, on which is mounted the drum 12.

14 represents a friction-roller engaging with the top of the rack-bar 8. Said rack-bar is projected through one of the side stanchions 2, first, so as to be out of the way, and, second, so as to have a firm support.

In order to prevent jars or shocks in the stopping and starting of the gate movement, I provide two instrumentalities: First, the incline 6 is gradual, as at *a*, at the stopping and starting point, so that as the friction-roller 9 comes in contact with it its motion is slow at the time. This could be used by itself with a degree of success; but it requires a longer time to open and close the gate than is desired. I have consequently provided another instrumentality, which consists in the attachment of the rope 13 and the pulley 12. This rope is the left rope, which passes over the pulley 12 and over the friction-rollers 15 16, and is connected to the gate 4, as shown in Fig. 1. By connecting the rope vertically to the pulley, as there shown, the pulley moves a considerable distance before any appreciable amount of winding on the pulley is commenced, and consequently no appreciable movement of the gate is maintained during this first portion of the movement of drum 12, which is moved by means of the pendulous lever 7, the rack-bar 8 engaging with the teeth of the gear 10 on the shaft of drum 12.

The operation is as follows: As the friction-roller 9 comes in contact with the inclined way 6 and starts to move it up, the rack 8 starts to move the pinion 10 and the drum 12, as shown in Fig. 4. The pulley 12 travels a considerable distance before there is any appreciable amount of rope wound upon the drum. The strain is gradually taken up and the speed is an increasing one, and the movement starts to raise the gate, and as the friction-roller 9 passes down the opposite side of the inclined way 6 and approaches the bottom the gate is slowly closed as the rope 13 is brought back to its normal position. It will be observed the rack-bar 8 reciprocates out and in, and the drum 12 is oscillated on its axis by the reciprocation of this bar. The friction-roller 14, the periphery of which engages with the top of the rack-bar 8, is sufficiently small to allow the rack-bar 8 to move in the arc of a

circle, so as to correspond with the movements of the pendulous arm 7, and at the same time this roller holds the rack-bar 8 in engagement with the pinion 10 and prevents any back or lost motion. Thus the rack-bar and pinion are held to their work, and yet the rack-bar allowed to oscillate and move smoothly in the performance of its work.

In the accompanying drawings I have shown, Fig. 1, the attachment to two hatchways, there being two gates on each side. There are consequently two ropes, as shown—one to operate the gate on the right-hand side and the other upon the left-hand side. Of course where only one gate is required but one rope will be employed. By having the pendulous arm 7 long there is less swinging movement, and consequently easier movement of the rack-bar. The weight of the gate, acting through the pulley 12, the pinion 10, and rack-bar 8, will hold the friction-roller 9 in contact with the incline plate 6, so as to open and close the elevator.

I have found from experience that the above construction of the parts works much more smoothly and without jar and shock and with decreased friction, and consequently gives greater satisfaction in use than other similar devices heretofore employed.

Having described my invention, what I claim is—

1. The combination, with an elevator having the incline 6 and the hatchway-gate 4, of the drum 12, having its shaft provided with a pinion 10, the stanchion 2, having a transverse orifice, the rack-bar 8, extending through the orifice in the stanchion and supported thereby, the pendulous arm pivoted at its upper end above the drum and at its lower end provided with the roller 9 and connected with the rack-bar, and the rope 13, secured to the drum and connected with the gate, substantially as described.

2. The combination, with the elevator having the inclined plate 6, provided at each end with the reduced inclined plane α and the sliding hatchway-gate 4, of the drum 12 and pinion 10, the rack-bar 8, the pendulous arm 7, pivoted at its upper end and at its lower end connected with the rack-bar and provided with the roller 9, and the rope 13, secured to the drum and connected with the gate, substantially as described.

3. The combination of the long pendulous arm pivoted at its upper end, carrying the friction-roller 9 at its lower end, and pivoted to the rack-bar 10, the friction-roller 14, engaging the upper side of said rack-bar, the pinion 10, the drum 12, and the rope 13, connected to the gate 4, substantially as herein specified.

4. In combination with the rack, pinion, and drum 12, located on stanchion 2 below the center of a vertical line of a given floor, the pendulous lever 7, pivoted to rack-bar 8 at one end and the other end pivoted at or near the floor above the drum 12, substantially as herein specified.

5. The combination, in an elevator, of the gate 4, the drum 12, the pinion 10, a rack-bar 8, engaging the pinion, a pendulous arm 7, connected with the rack-bar and the inclined plate 6 on the car, with sheaves above the gate, and the cable 13, secured to the gate, passing over the sheaves, and connected vertically to the drum at a point which is above its axis when the gate is in its normal position, so that the movement of the gate is slowest as it commences to open, substantially as described.

In testimony whereof I have hereunto set my hand.

JOHN G. ZELLER.

Witnesses:

JOS. P. ILIFF,
ELIZABETH JONES.