

No. 710,007.

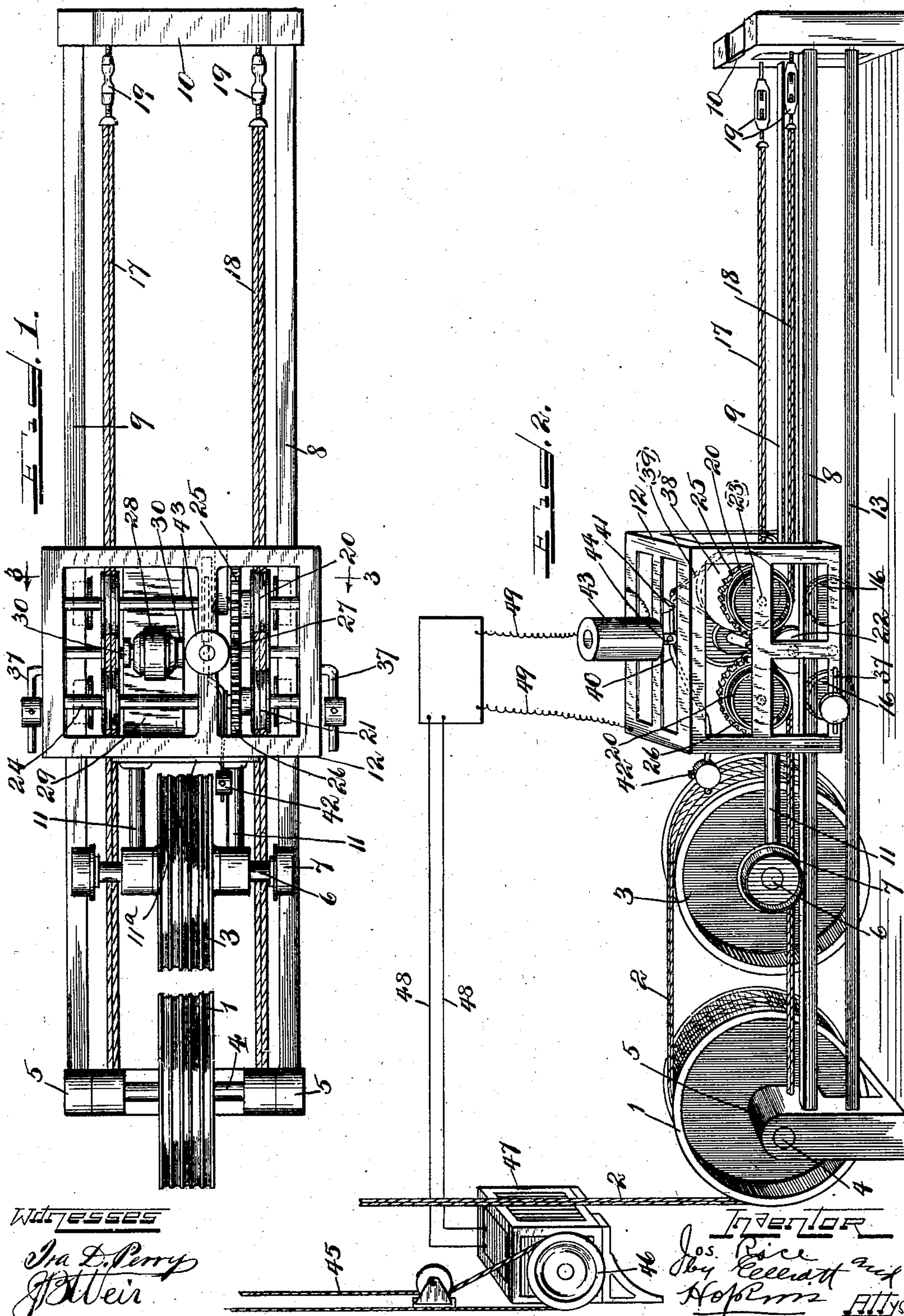
Patented Sept. 30, 1902.

J. RICE.  
ELEVATOR.

(Application filed Apr. 8, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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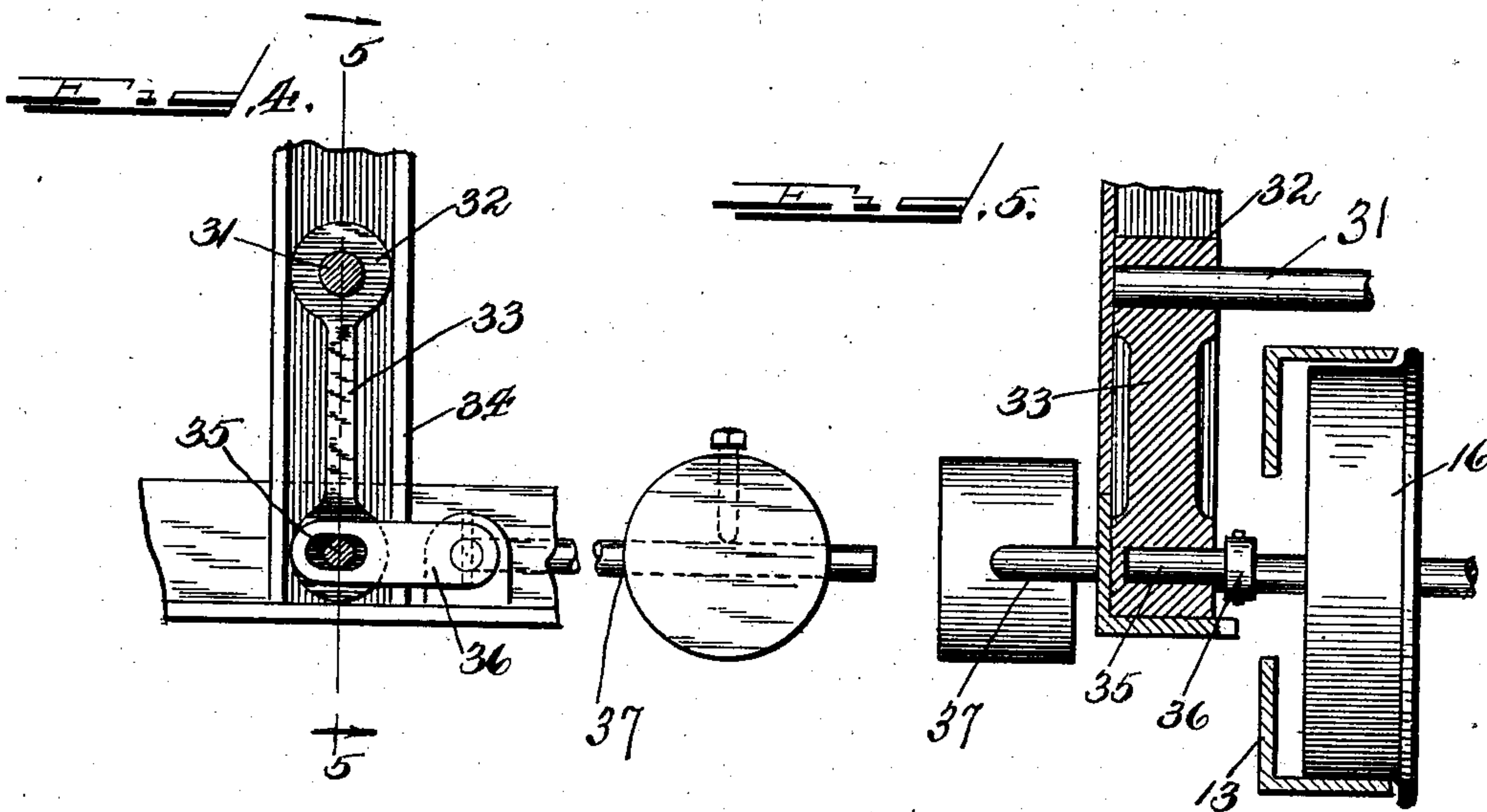
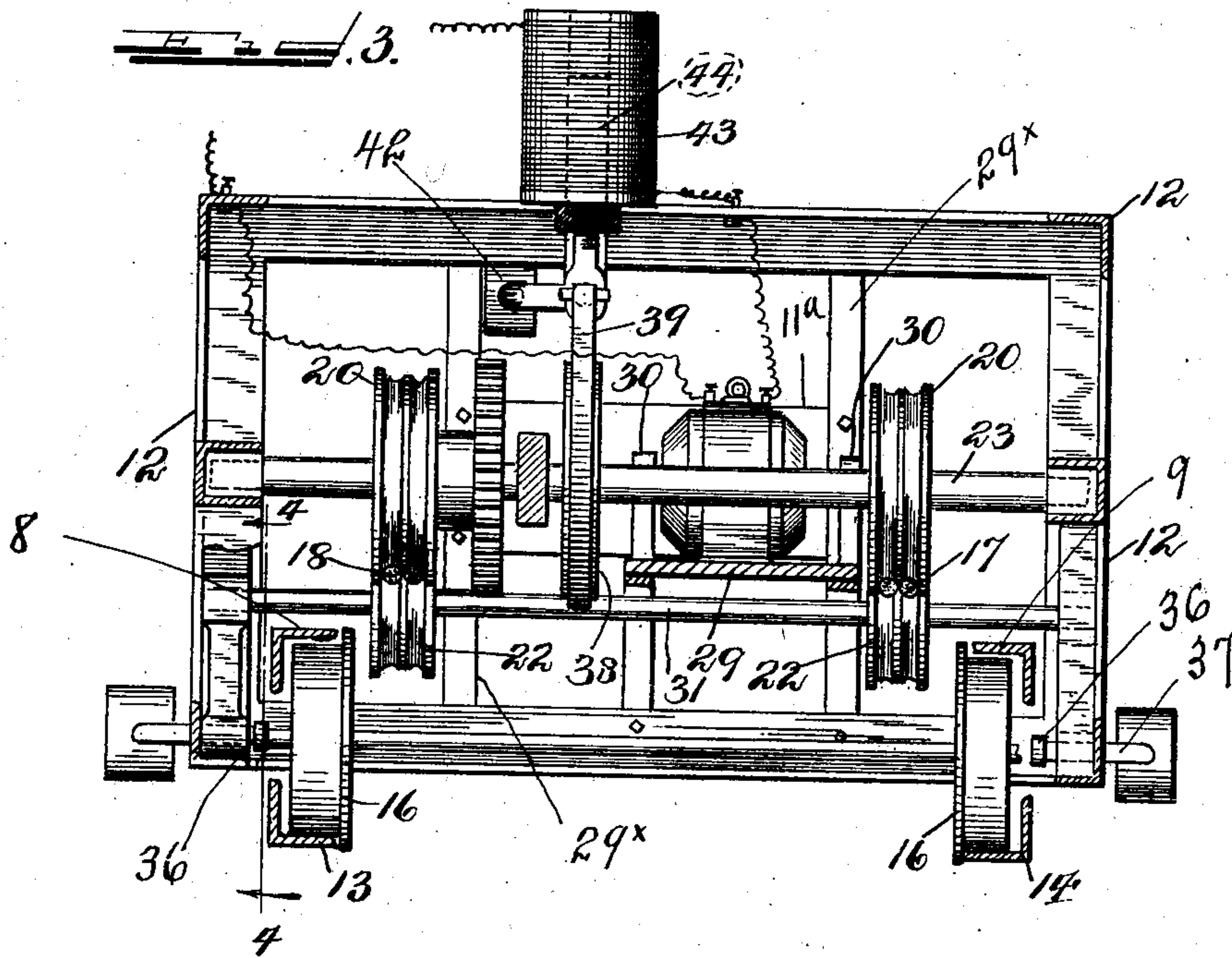
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2 Sheets—Sheet 2.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

JOSEPH RICE, OF CHICAGO, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO  
WILLIAM H. REEDY AND WILLIAM I. REEDY, OF CHICAGO, ILLI-  
NOIS.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 710,007, dated September 30, 1902.

Application filed April 8, 1901. Serial No. 54,834. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH RICE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have  
5 invented certain new and useful Improvements in Elevators, of which the following is a full, clear, and exact specification.

My invention relates more particularly to the power mechanism for imparting motion  
10 to the traveling sheave for raising and lowering the elevator-car; and it has for its primary object to accomplish this result by means of a locomotive or traveling motor of improved and efficient form.

15 With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are at-  
20 tained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a plan view of my improved apparatus. Fig. 2 is a  
25 perspective view thereof, showing it in connection with a starting-box controlled from the car by the usual hand-cable. Fig. 3 is an enlarged transverse sectional view taken on the line 3 3, Fig. 1. Fig. 4 is a detail sec-  
30 tional view taken on the line 4 4, Fig. 3; and Fig. 5 is a detail section taken on the line 5 5, Fig. 4.

1 is the fixed sheave, which may be of the usual or any suitable construction and around  
35 which the cable 2 for raising and lowering the elevator-car (not shown) is passed, and 3 is the traveling sheave, around which the cable 2 is also passed one or more times according to a well-known method. The sheave  
40 1 is journaled upon a shaft 4 and mounted in suitable standards 5 and the traveling sheave 3 on a shaft 6, supported at its ends by wheels or rollers 7, running upon a track  
45 constituted by two rails 8 9, which are mounted at opposite ends in the standards 5 and additional standards 10, and the shaft 6 of the traveling sheave is connected by arms or  
50 rods 11 to a frame 12, which constitutes the frame of the traveling motor or locomotive, and which frame is in turn supported upon

a track constituted by a pair of rails 13 14, both the rails 13 14 and the aforesaid rails 8 9 being preferably composed of angle-irons, as illustrated in Fig. 3, and the latter rails being arranged sufficiently close to the upper  
55 sides of wheels or rollers 16, which support the frame 12 on the rails 13 14, to serve as guards for insuring against derailment of the device. The rails 13 14 are suitably secured at opposite ends in the standards 5 10, re-  
60 spectively.

In driving the motor or locomotive on the rails 13 14 I do not depend upon the traction or grip of the wheels 16, which would hardly be sufficient to prevent slipping and impart  
65 the requisite power to the traveling sheave 3. Nor could the desired result be effectively accomplished by making the rails 13 14 in the form of rack-bars and providing the wheels  
70 16 with cogs or teeth, because while such wheels might then have the requisite traction on the rails 13 14 to propel the motor the lost motion between the teeth of the rails and the teeth of the wheels would be multiplied on the  
75 elevator-car to a very objectionable extent, and the uneven or jerky motion characteristic of a loose or worn gear-wheel propelling itself along a rack-bar would also be multiplied to  
80 a very objectionable extent on the car. To accomplish the desired result, therefore, and  
85 avoid these objections, I employ one or more stationary cables fixed with relation to the motor carriage or frame and a corresponding number of rotating grip-wheels or pulleys  
90 driven by and carried on the traveling motor. In the example of the invention shown in this application I employ two pairs of these sta-  
95 tionary cables, which are indicated at 17 18. These are arranged substantially parallel with the rails 13 14 and secured at one end  
100 of the apparatus to the standards 5 or other suitable anchorage and at the other end to the standards 10, suitable turnbuckles 19 being employed for taking up slack. Each pair of these cables is engaged and gripped  
by two grip-wheels 20 21 on the upper side and a cable-tightener 22, arranged below and between the wheels 20 21 and engaging the under side of the cables, so as to pinch them upwardly between the two wheels 20 21, which



are set a slight distance apart, as clearly shown in Figs. 1 and 2. The grip-wheels 20 are mounted upon a cross-shaft 23, journaled at opposite ends in the frame 12, and the grip-wheels 21 are secured to a cross-shaft 24, extending parallel with the shaft 23 and also journaled at opposite ends in frame 12, and these two shafts are connected by gears 25 26, respectively, to a pinion 27 on the shaft of a motor 28, which may be an electric motor or motor of any other suitable type and may be supported on the frame 12 by a member 29, which also constitutes a support for the bearings 30 of the armature-shaft. The tight-ener-wheels 22 are mounted upon a cross-shaft 31, whose ends are journaled in boxes 32, secured to or formed on the upper ends of links 33, arranged in guideways 34, formed in the sides of the frame 12. The lower ends of the links 33 are connected by pin-and-slot connection 35 to crank-arms 36, secured to in-turned ends of weighted arms 37, which tend to lift both ends of the cross-shaft 31 and force the wheels 22 against the under sides of the cables 17 18, thereby pinching the cables upwardly between the wheels 20 21 and causing the motor-carriage to travel along the rails 13 14 and impart motion to the sheave 3.

In order that the elevator-car may be held at rest at any desired elevation, the motor-carriage may be provided with any suitable form of brake that will hold it stationary when the elevator-car reaches the desired position, the electric circuit to the motor 28 being at the same time cut off. There are various forms of brake mechanisms that will readily suggest themselves to those skilled in the art. As an example I have shown the shaft 23 provided with a brake-wheel 38, which is embraced by a strap-brake 39, having its upper or free ends suitably connected to one end of a brake-lever 40, pivoted to a hanger 41 on the frame 12 and having its free end provided with an adjustable weight 42, which applies the brake when unrestrained. The brake may be held inactive while the motor 28 is operating by any suitable mechanism, such as an electromagnet or solenoid 43, secured to the frame 12 and having its armature 44 pivoted at its lower end to the brake-lever 40, so that when the current is turned on for operating the motor 28 the brake will be automatically released, and should the current to the motor 28 be broken, either purposely or accidentally, the weight 42 will automatically apply the brake and prevent the elevator-car from falling.

The motor 28 and magnet 43 may be actuated from the elevator-car in any suitable way. In the drawings I have shown the hand rope or cable 45 passing around a pulley 46, which controls the internal mechanism of a switch or starting-box 47 of the usual or any suitable construction, whose terminals may be connected by conductors 48 49 to the magnet 43 and motor 28, so that the two latter will be actuated simultaneously and

the motor-carriage caused to travel in either direction by operating the hand-cable 45.

I claim—

1. In an elevator the combination of a flexible strand or cable fixed against movement, a traveling sheave, gripping means operatively connected with said sheave and gripping said cable or strand, means for actuating said gripping means to cause the same to move along said cable or strand and impart motion to said sheave, a second sheave and a lifting-cable operatively related to said sheaves, substantially as set forth.

2. In an elevator the combination of a fixed cable or strand, a friction-grip engaging said cable or strand, means for actuating said grip to cause it to move along said cable or strand, a lifting-cable and means operatively connecting said lifting-cable with said friction-grip whereby a pull will be imparted to the lifting-cable by the movement of said grip along said strand, substantially as set forth.

3. In an elevator the combination of a fixed cable or strand, friction grip-wheels engaging said cable, means for rotating one of said wheels to cause the same to travel along said cable, a lifting-cable and means operatively connecting said lifting-cable with said friction-wheels for imparting a pull to said lifting-cable, substantially as set forth.

4. In an elevator the combination of a fixed cable or strand, a grip for said cable or strand comprising friction-wheels adapted to pinch the cable between them, means movable with said grip for rotating one of said wheels, a lifting-cable and means operatively connecting said lifting-cable with said grip whereby a pull will be imparted to the lifting-cable as the grip moves along said fixed cable, substantially as set forth.

5. In an elevator the combination of a fixed cable or strand, a pair of grip-wheels engaging the same on one side, a friction-wheel engaging said cable on the opposite side between said other wheels, means for elastically pressing said friction-wheel against the cable, means for rotating one of said wheels and thereby causing them to travel along said cable, a lifting-cable and means operatively connecting said lifting-cable with said wheels whereby a pull will be imparted to the lifting-cable as said wheels move along said fixed cable, substantially as set forth.

6. In an elevator the combination of a fixed cable or strand, traveling gripping means engaging said cable or strand and adapted to move therealong, means movable with said gripping means for operating the latter, a brake for arresting the operation of the last said means, a lifting-cable and means operatively connecting said lifting-cable with said gripping means whereby a pull will be imparted to the lifting-cable as the gripping means move along said fixed cable, substantially as set forth.

7. In an elevator the combination of a fixed strand or cable, gripping means movable



therealong, a motor movable with said gripping means for actuating the same to move along said cable, a brake-wheel operatively connected with said motor, a brake for engaging said wheel, means continually tending to apply said brake, an electric device for releasing said brake, a lifting-cable and means operatively connecting said lifting-cable with said gripping means whereby a pull  
10 will be imparted to the lifting-cable as the gripping means move along said fixed cable, substantially as set forth.

8. In an elevator the combination of a carriage, a track or way upon which said carriage travels, a motor mounted on said carriage, fixed strands or cables passing said carriage on opposite sides of said motor, grip-wheels operatively connected with said motor  
15 and engaging both of said strands or cables for causing said carriage to move lengthwise

of said strands or cables, a lifting-cable and means operatively connecting said lifting-cable with said carriage, substantially as set forth.

9. In an elevator the combination of a carriage, a track or way on which said carriage travels, a motor mounted on said carriage, cables or strands fixed with relation to said carriage and passing the same on opposite sides of said motor, grip-wheels operatively  
25 connected with the motor and engaging both of said cables or strands, a lifting-cable and means operatively connecting said lifting-cable with said carriage at a point between said  
30 first cables, substantially as set forth.

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Witnesses:

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