

(No Model.)

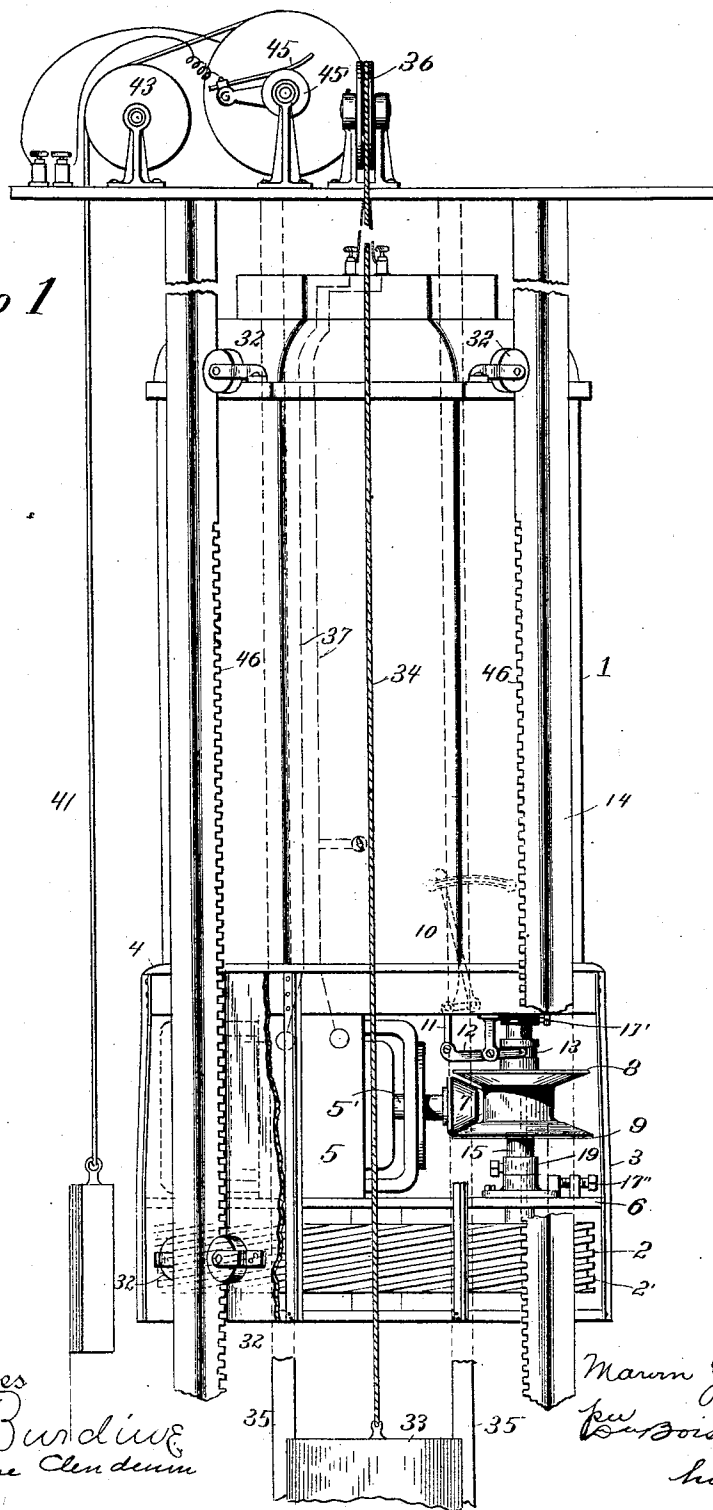
3 Sheets—Sheet 1.

M. Y. CALCUTT.
ELEVATOR.

No. 479,390.

Patented July 19, 1892.

Fig 1



Witnesses
C. C. Burdine
H. Hume Clevenger

Inventor
Marvin Y. Calcutt
per *Carroll D. Davis*
his Attorney.

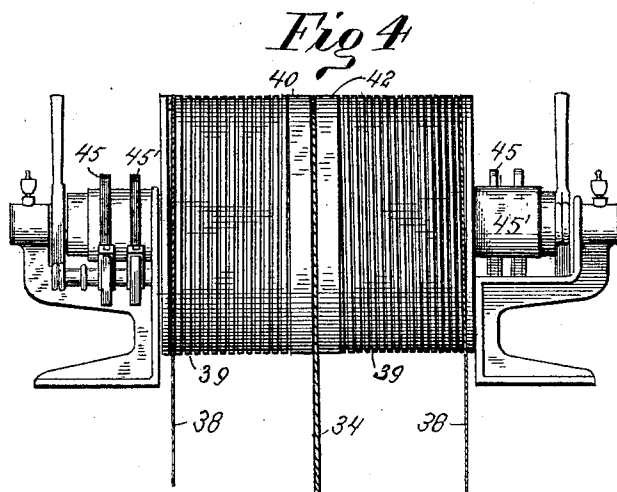
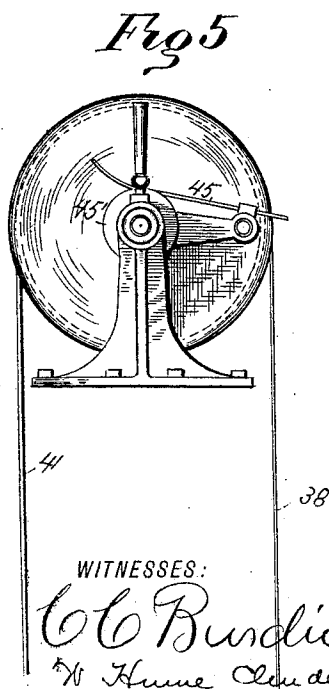
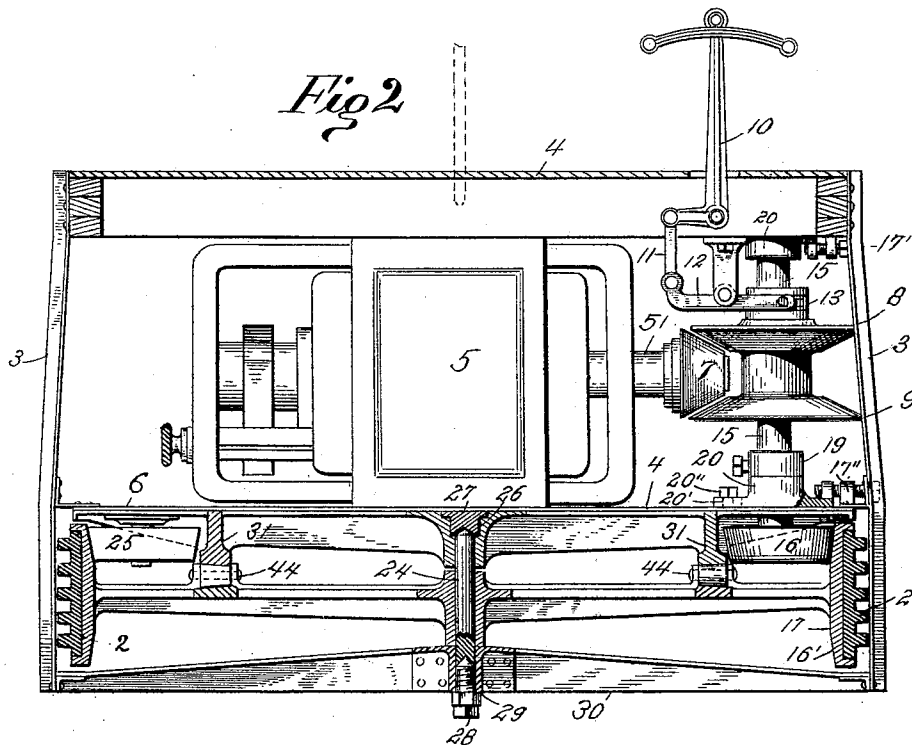
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M. Y. CALCUTT.
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Patented July 19, 1892.



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his ATTORNEYS

(No Model.)

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Fig 3

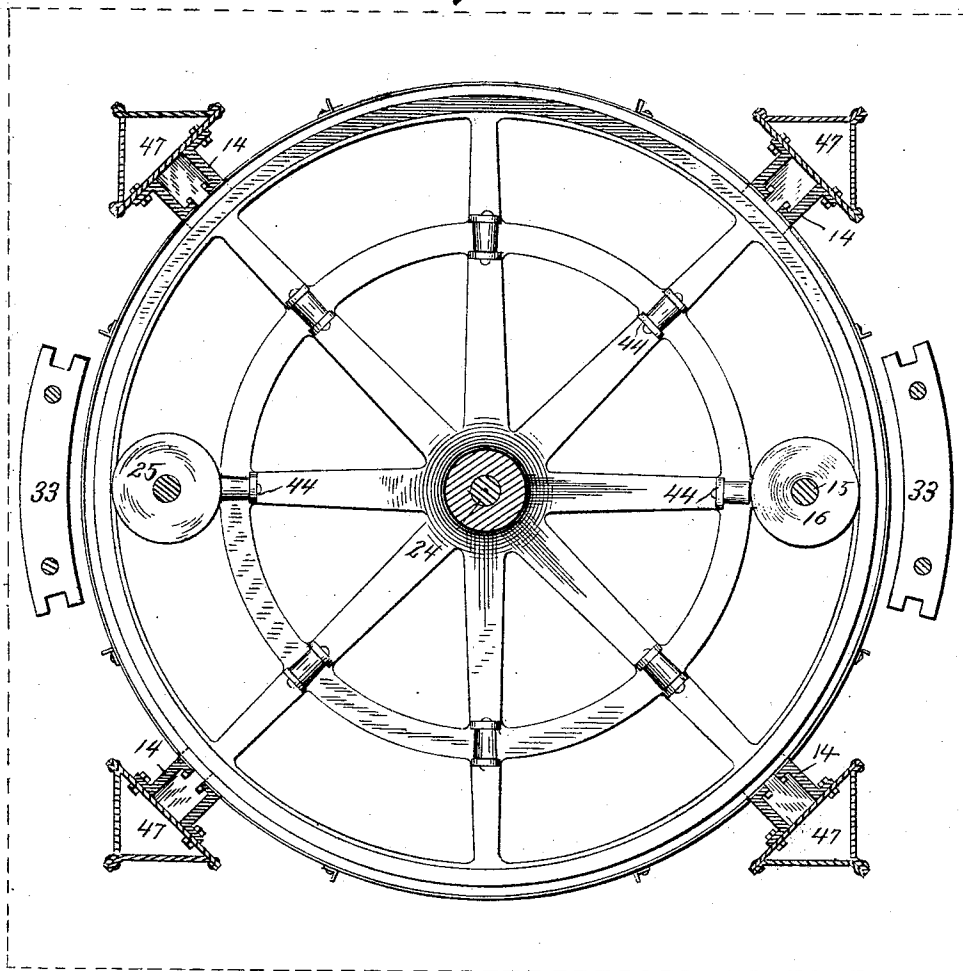


Fig 6

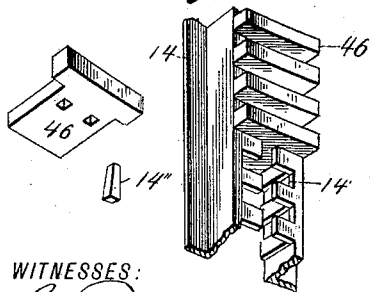
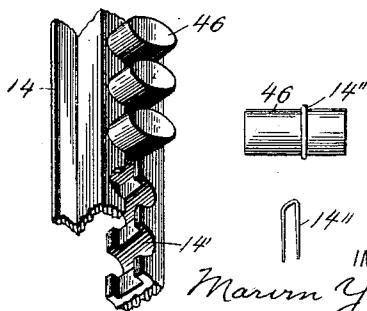


Fig 7



WITNESSES:
C. C. Burdine
John C. C. Burdine

INVENTOR
Marvin Y. Calcutt
By [Signature]
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UNITED STATES PATENT OFFICE.

MARVIN Y. CALCUTT, OF SEATTLE, WASHINGTON, ASSIGNOR OF TWO-THIRDS
TO HENRY L. ROCHELLE AND EDWARD BRADY, OF SAME PLACE.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 479,390, dated July 19, 1892.

Application filed December 15, 1891. Serial No. 415,128. (No model.)

To all whom it may concern:

Be it known that I, MARVIN Y. CALCUTT, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Elevators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

My invention relates to that class of elevators which are actuated by an electric motor and screw, and it is designed as an improvement on the construction described in my pending application filed February 16, 1891, and bearing Serial No. 381,572.

The particular purpose of my device is to provide improved means for starting and stopping the motor, for adjusting the various parts connected therewith, for counterbalancing the car and electric cable, and increasing the efficiency and durability of the wearing parts; and to this end my device consists in the peculiar features and combinations of parts more fully described hereinafter, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my complete device, parts of which are broken away to show the interior mechanism; Fig. 2, a side elevation, partly in section, of the motor, screw, and their supporting-frame; Fig. 3, a transverse top view showing a plan of the screw frame or wheel; Fig. 4, a side elevation of the cable-drum; Fig. 5, an end view of the same, showing immediate connections; Fig. 6, a detail view of the screw-rack, showing the removable teeth; Fig. 7, a detail view of a modified form of removable teeth.

The reference-numeral 1 denotes an elevator car or cage supported upon a large screw 2, having segmental threads 2', which operate within a frame 3, attached to the floor 4 of the car. This screw works in fixed vertical screw-racks 14 and is revolved to the right or left through the medium of an electric motor 5, located on a floor 6, rigidly secured within the frame 3. The shaft 5' of

the armature is horizontal and communicates motion to a friction-clutch comprising a cone-pinion 7 on the armature-shaft, which cone is placed between a pair of friction-cones 8 and 9, arranged to be thrown in and out of contact by means of a hand-lever 10 to be operated from within the car. The lower arm of this lever is connected to a link 11, which in turn is connected to one arm of lever 12, the latter having its opposite end passed astride and pivoted to a loose collar 13, embracing a sleeve on the upper cone. The cones 8 and 9 are fixed on a vertical shaft 15, the lower end of which passes through the floor 6 and is provided with a friction pinion or cone 16, engaging a beveled inner surface 16' on the inside of the rim 17 of the screw 2. The shaft is supported by a collar 19, rotating on seat 20. The pressure of cone 16 on the rim 17 of the screw can be easily regulated by horizontal set-screws 17' 17'', which move the seat or bearings 20 toward or from the rim, the seat being permitted to slide through the medium of elongated slots 20' and bolts 20''. A like arrangement is applied to the upper end of shaft 15. Diametrically opposite the friction-pinion 16 is located an idle-cone 25 to steady the screw and frame against horizontal play.

The entire weight of the car and motor is sustained by a central pivot 24 and a series of rollers 44, mounted on the spokes of the wheel-frame. The upper end of the pivot 24 is tapered and fits within a corresponding recess 26 in the under side of a seat 27, both the pivot and seat being made of extremely hard and durable material. The lower end of the pivot rests upon a vertically-adjustable screw 28, operating in a threaded socket 29 of a cross-beam 30, forming part of the frame 3. By this arrangement the circular track or shoe 31 on the under side of the floor 4 can be adjusted to bear lightly on the rollers, and thereby transfer the majority of the weight to the central pivot 24, so that the screw 2 can be the more easily revolved and wear on the pivot and its bearings taken up.

The teeth 46 of the screw-racks 14 are made removable and insertible within sockets 14', where they are locked by staples 14'', as shown more clearly in Fig. 6. When thus inserted, a hollow rack is employed. It may be advis-

able to use beveled teeth, like those shown as a modification in Fig. 7. In this latter case the frictional surface presented to the screw-threads is much smaller; but the pitch should
 5 always be sufficient to prevent the screw from revolving by the weight upon it or running away with itself. To render the mechanism more noiseless, the rack-teeth are composed of vulcanized fiber.

10 In the transverse top view in Fig. 3 a modification is shown, in which the screw-racks are attached to the face of hollow triangular standards 47, formed of riveted plates, as in bridges, &c.

15 The car and its immediate auxiliaries are guided and steadied in their vertical movements by the usual rollers 32, and the car is counterbalanced by weights 33, suspended by cables 34, traveling between guides 35. There
 20 are two of these counterbalancing-weights, one on each side of the car, and their cables 34 pass over pulleys 36 at the top of the well.

Electricity is supplied to the motor through the incoming wires 37 and passes through
 25 brushes 45 and contact-pieces 45' to the electric cable 38, winding in spiral grooves 39 on a drum 40, made to automatically wind the cable by means of a counter-balance connected to a cable 41, winding in a central groove 42
 30 and passing over pulley 43.

The preferred construction of my device having been set forth, I will now proceed to describe its operation. When it is desired to raise or lower the car, the screw can be
 35 actuated to the right or left by simply throwing hand-lever 10 forward or backward, which action will throw either one of the friction-cones 8 and 9 in or out of engagement with the pinion 7. The latter revolves in one di-
 40 rection only, and thus prevents any accidents which might arise from reversing the motor. Now when the pinion is thus thrown into engagement with either of the cones 8 and 9, the shaft 15 will be rotated and actuates cone
 45 16, which engages the inner surface 16' of the rim 17 of the screw-frame and operates the screw.

My improvements carry with them the advantage of fine adjustment to take up wear,
 50 the removability of wearing parts, simplicity of construction, durability, and cheapness; and a still further advantage is that which enables the elevator to be started and stopped

without the sudden and unpleasant "drop" common to elevators now in use. 55

It is evident that instead of the friction-cone 16, which engages the rim of the screw-frame, a cog-pinion could be substituted to engage an internal cog-gear, and it is also apparent that my invention could be varied in
 60 many ways that might suggest themselves to a skilled mechanic. Therefore I do not limit myself to the exact construction herein shown, but consider myself entitled to all such variations as come within the scope of my in-
 65 vention.

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

1. In an elevator, the combination of a 70 screw having a vertical axis and operating in vertical screw-racks, a car carried by or supported upon the screws, an electric motor located in a frame depending from the car and geared to the screw, roller-bearings interposed
 75 between the screw-frame and the weight supported thereby, and a central adjusting-screw to regulate the pressure on the rollers, substantially as described.

2. In an elevator, a screw having a vertical 80 axis and engaging vertical screw-racks, a car located above the screw, a frame suspended from the car, a motor mounted in the frame and having a horizontal armature-shaft provided with a pinion, a vertical shaft carrying
 85 gears engaged by the pinion, the lower end of said shaft being also provided with a pinion to actuate the screw, and an adjusting-screw for moving the shaft laterally, as and for the purpose specified. 90

3. In combination with an elevator-car, an electric motor secured to the car, electric cables leading from the car to a drum located at the top of the elevator-well, said drum being provided with cable-receiving grooves, 95 and a counterbalance-rope winding in a groove between the cable-grooves to counterbalance the cables, as and for the purpose specified.

In testimony whereof I affix my signature in 100 presence of two witnesses.

MARVIN Y. CALCUTT.

Witnesses:

GEO. H. KING,
 EDWARD BRADY.