

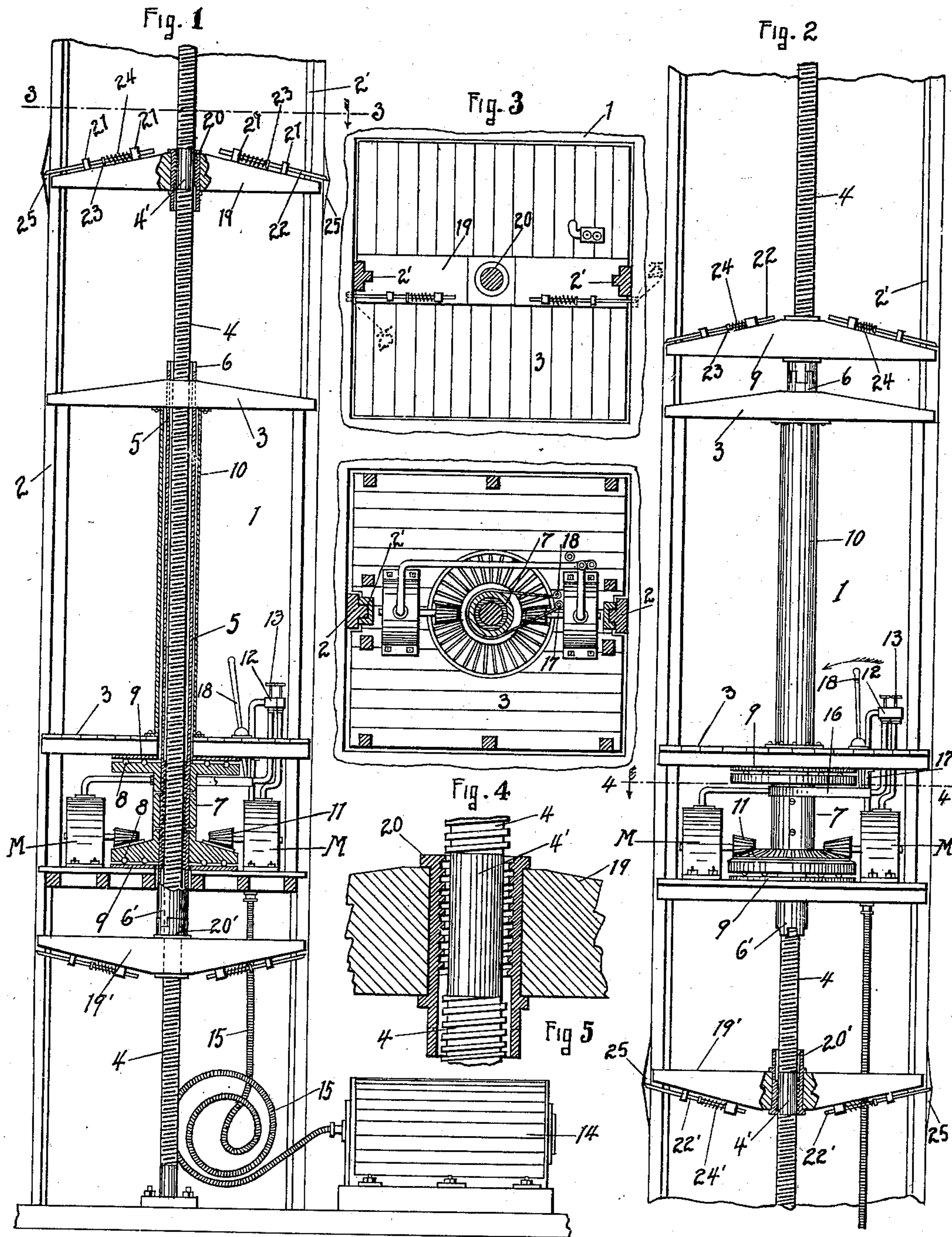
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Patented Nov. 13, 1900.

J. GARY.
ELEVATOR.

(Application filed Aug. 4, 1900.)

(No Model.)



WITNESSES:

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JEFFERSON GARY, OF ST. LOUIS, MISSOURI.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 661,716, dated November 13, 1900.

Application filed August 4, 1900. Serial No. 25,918. (No model.)

To all whom it may concern:

Be it known that I, JEFFERSON GARY, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Elevators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in elevators; and it consists in the novel arrangement and combination of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a sectional elevation of my elevator, showing the cage in its lowest position. Fig. 2 is a similar elevational view showing the cage elevated a suitable distance. Fig. 3 is a transverse section on line 3 3 of Fig. 1, taken above the upper brace-beam. Fig. 4 is a transverse section on line 4 4 of Fig. 2, taken through the stationary screw and sleeve rotatable about the same; and Fig. 5 is an enlarged sectional detail of the screw and the rotatable collar carried by the brace-beam.

The object of my present invention is to construct a passenger or freight elevator which can be operated without the use of cables, counterweights, rack-bars, and similar devices, thereby materially simplifying the driving mechanism by which the elevator-cage is propelled in either direction.

In detail the invention may be described as follows:

Referring to the drawings, 1 represents the elevator-shaft, 2 the side guide-timbers, and 2' the tongues or tracks along which cage 3 travels. Located centrally within the shaft and projecting through the cage is a stationary screw 4, along which the cage travels in either direction. Surrounding the screw and passing slightly beyond the limits of the cage in either direction is an inner sleeve 5, having upper and lower coupling-terminals or male clutches 6 6', respectively, the inner surface of the said sleeve being smooth with the exception of the portion confined between the two bottom floors of the cage, which is screw-threaded, thereby enabling the said sleeve when turned in proper direction to travel up or down the screw, as will presently be more

readily apparent. Enveloping said sleeve and secured rigidly thereto in any mechanical manner and located between the two bottom floors of the cage is a spool 7, the upper and lower flanges of which are provided with grooves 8 for the reception of ball-bearings traveling along plates 9 9, secured to the respective lower floors of the cage. That portion of the sleeve 5 between the main floor and roof of the cage is protected by an outer stationary sleeve 10.

The upper surface of the basal flange of the spool 7 is provided with bevel gear-teeth which mesh with the terminal pinions 11 11 of the drive-shafts of the motors M M, carried by the lower floor of the cage, said motors in the present instance being illustrated as rotary engines deriving their steam through the valve-controlled casing 12, provided with valves 13 13, respectively adapted to feed steam first to one motor and then the other. The casing 12 is connected to the motor-fluid generator or boiler 14 by a flexible hose 15. Upon starting one of the motors M and imparting rotation to the spool 7 in the proper direction the sleeve 5, and hence the cage 3, will travel up along the screw 4. Upon shutting off this motor and starting the other the spool will be driven in the opposite direction and the cage will descend. In the present instance the spool is provided with a brake-band 16, passing around the spool, one end of the band being secured to a bracket 17 and the other to the lower end of a brake-lever 18, whose upper end projects into the cage and is within easy reach of the operator, the brake being shown as applied in Fig. 1.

For deep shafts it becomes necessary to brace the stationary screw 4 against any lateral strains which might result in bending the screw. This I accomplish as follows: At a convenient point along the screw 4 and above the cage is disposed a brace-beam 19, provided with a central interiorly-screw-threaded loosely-mounted collar 20, adapted to travel up and down the screw. Normally the beam 19 rests or comes to a stop when the collar comes opposite the smooth or threadless section 4' of the screw, the beam being provided along its upper surface with guide loops or eyes 21, through which loosely pass the rods 22, each rod being provided with a

collar 23, against which bears one end of a resilient spring 24, coiled about the rod, the opposite end bearing against the adjacent loop 21. When the beam 19 comes opposite the portion 4', the springs 24 force the tapering outer ends of the rods 22 into the pockets 25, the latter being formed by the meeting edges of opposite gently-sloping walls or surfaces formed in the path of the shaft.

The lower projecting edge of the rotatable collar 20 constitutes the female section of the clutch formed therewith by the upper end of the sleeve 5. As the latter rotates with the elevation of the cage along the screw 4 it engages the collar 20, rotating and elevating it and the beam 19 along the screw, the gradual sloping walls of the pocket 25 forcing the rods 22 inward. As the cage descends it of course brings down the brace-beam 19 with it until the latter comes opposite the pockets 25, by which time the collar 20, coming opposite the threadless portion 4' of the screw, simply turns about it without descending along the same, the cage, with its sleeve 5, continuing down and leaving the beam 19 behind, it being understood that the screw-threads in the collar 20 do not come down far enough to seize the threads of the screw 4 below the section 4', the engagement of the ends of the rods 22 with the bases of the pockets 25 preventing the descent of the beam to that extent, the threads of the collar being always in position, however, to seize the upper continuation of the screw above the section 4' as the cage is descending. A similar brace-beam 19' is located below the cage, this beam being reciprocated along the screw 4 in a similar manner, and when the bottom of the cage has ascended beyond the plane in which the pockets 25 are disposed the beam 19' is left behind, with its rods 22' engaging said pockets, its central collar 20' being so threaded that it misses the upper screw-threaded continuation of the screw 4 above the section 4', but is always in position to engage the lower threaded section the moment the cage descends and forces the beam 19' downward upon the coupling of the lower end of the sleeve 5 and collar 20'. Like the rods 22, the rods 22' are similarly forced out of their pockets along the gradually-inclined walls of the same, the same walls permitting the gradual expansion of the rods 22' under the action of the springs 24'. With the arrangement as described, therefore, the screw 4 is always retained rigid against lateral strains by means of the traveling brace-beams 19 19', the beam 19 advancing before and the beam 19' following behind the cage upon its ascent and the reverse taking place upon the descent of the cage, each beam in turn being left behind opposite the pockets 25 and the section 4' of the screw, the other beam being always in engagement

with the sleeve 5, by which the cage is screwed up and down, as it were, along the screw 4. 65

Having described my invention, what I claim is—

1. In an elevator a suitable cage, a screw along which said cage travels, and brace-beams for said screw, adapted to be advanced with the cage along the screw by the movement of the cage, substantially as set forth. 70

2. In an elevator, a suitable cage, a screw along which said cage travels, brace-beams for said screw adapted to be advanced along the screw by the cage upon the travel of the latter, and means for arresting the travel of the brace-beams at certain points along the length of the screw, substantially as set forth. 75

3. In an elevator, a central stationary screw disposed vertically in the shaft of the elevator, and passing through the cage thereof, a brace-beam having a central interiorly-screw-threaded collar through which the screw passes, means for coupling said collar to the cage during a portion of the travel of the latter in each direction, the screw having a smooth or threadless portion which arrests the travel of the collar and brace-beam carrying the same, substantially as set forth. 80 85 90

4. In an elevator, a central stationary screw, having a smooth or threadless portion at a certain point along the length thereof, a brace-beam having a central rotatable threaded collar adapted to travel along the screw, pockets formed in the shaft-walls opposite said smooth portion in the screw, and spring-controlled rods guided along and supported by the brace-beam, the outer ends of the rods being adapted to enter the pockets, and hold the beam rigidly in place, substantially as set forth. 95 100

5. An elevator comprising a shaft, a cage for the same, a stationary screw passing through the cage, a screw-threaded sleeve secured to the cage and passed over the screw and provided with a coupling-terminal at each end, a flanged spool rigidly secured to the sleeve, bearing-plates carried by the cage, ball-bearings interposed between flanges of the spool and bearing-plates, suitable motors carried by the cage and imparting rotation to the spool and sleeve, a suitable brake for the spool, brace-beams above and below the cage, rotatable collars carried by the beams and adapted to travel along the screw and provided with coupling-terminals, adapted to couple to the adjacent ends of the sleeve, whereby the brace-beams are caused to travel along the screw during the travel of the cage in each direction, substantially as set forth. 105 110 115 120

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

JEFFERSON GARY.

Witnesses:

EMIL STAREK,
G. L. BELFRY.