No. 749,193. PATENTED JAN. 12, 1904.

N. HISS.

ELEVATOR.

APPLICATION FILED NOV. 11, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

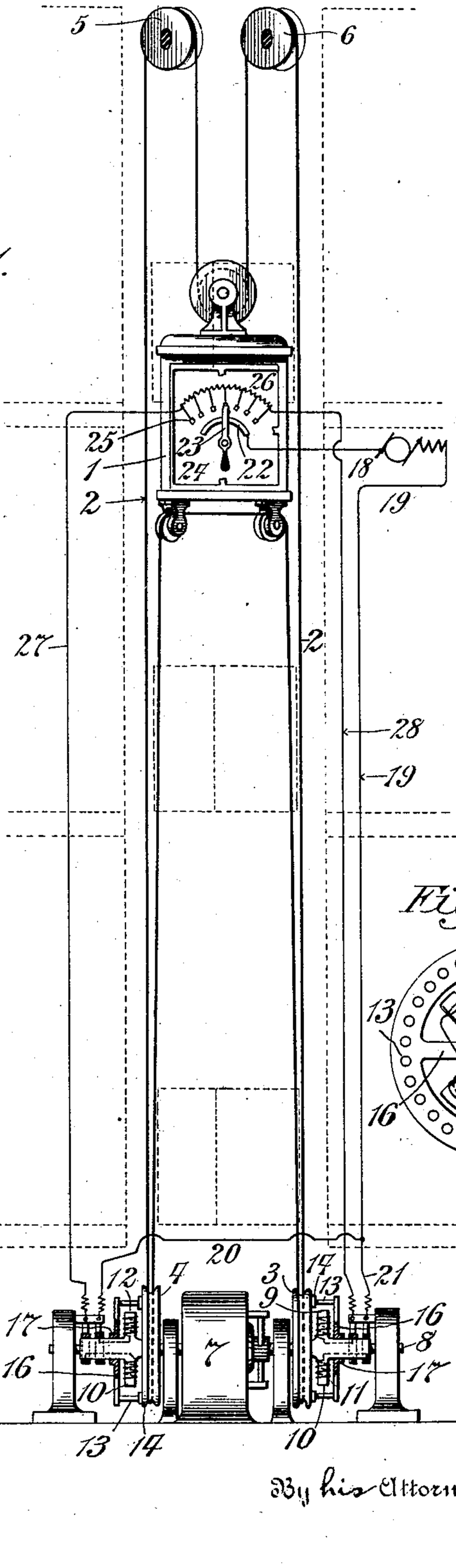
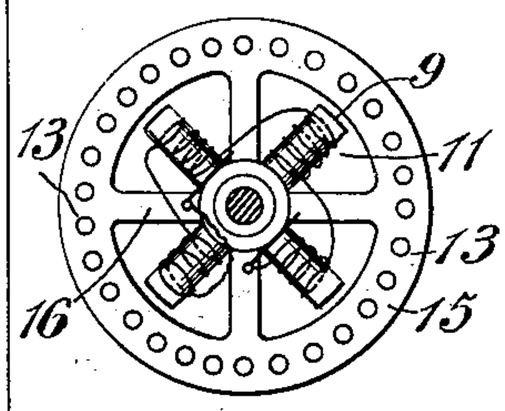


Fig. 3.



Witnesses:
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Florence Pick

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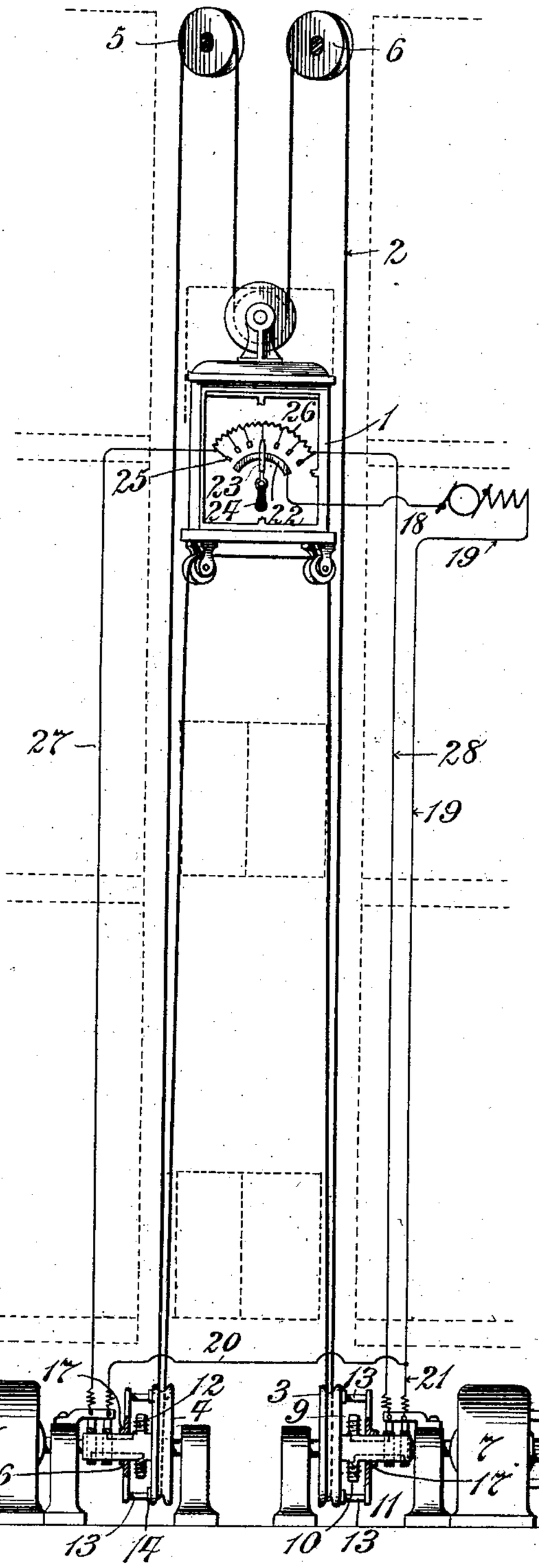
NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.



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No. 749,193. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

NELSON HISS, OF NEW YORK, N. Y.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 749,193, dated January 12, 1904.

Application filed November 11, 1903. Serial No. 180,681. (No model.)

To all whom it may concern:

Be it known that I, NELSON HISS, a citizen of the United States, residing in the city, county, and State of New York, have invented a certain new and useful Improvement in Elevators, of which the following is a specification.

My present invention has relation to an improved mechanism for the operation of elevators, whereby the cage or car is moved by means of an endless cable driven either by one or by two motors. Said cable is arranged in two bights and moves always in the same direction, while it is made to operate the car one way or the other or not at all by varying the relative degrees of effort which the motor or motors is or are permitted to exert upon said two bights of cable without necessarily changing the speed of the driving motor or motors or the diameters of the sheaves whereby said two bights of cable are operated.

In the accompanying drawings, Figure 1 shows one embodiment of my invention wherein a single driving-motor is employed. Fig. 2 shows an embodiment of the same wherein two motors are used, and Fig. 3 is an elevation of one form of transmission member which may be used with my elevator apparatus.

It is to be understood that although I have shown but one specific arrangement of endless cable and that in a car without a counterweight my invention is applicable to forms of apparatus employing a variety of cable arrangements and whether counterweights are or are not used.

In the drawings the car or cage is shown at 1. This is provided with sheaves above and beneath it, over which runs the endless cable 2. This cable hangs in two bights, as shown, and each bight embraces a driving-sheave. These sheaves are shown at 3 and 4. The driving-cable, as shown, passes around and up in front of the sheave 3, thence over the pulleys under the car 1 and down behind the sheave 4. Passing around and up in front of the sheave 4 it runs over the sheave 5 at the top of the elevator-shaft and down to the top of the car, passing around and under the pulley thereon, up over pulley 6 at the top of the shaft, and back to close upon itself at the sheave 3. It is evident that if equal efforts are applied to the two driving-sheaves 3 and 4 the two bights of cable driven by them will tend to move at the same speed and the car will stand still. If, however, while both are driven in one direction, as indicated by the arrow in the drawings, an excess of driving effort be applied to the sheave 3, the left-hand bight of cable will tend to move more rapidly than the other, and thus cause an upward movement of the car 1. Contrary inequality of effort will produce for a like reason downward movement of the car.

In Fig. 1 the prime mover is shown as an electric motor 7, whose shaft 8 is extended on both sides and carries the two sets of magnetizable poles 9 10, provided, as shown, with energizing-circuits 11 and 12, respectively. These magnetizable poles form in each set one member of an electromagnetic transmission means, and when energized and revolving with the shaft 8 these poles produce magnetic lines which tend to produce strong currents in any conductors across which such lines are made to sweep by virtue of this revolution. The second member of each transmission means is accordingly provided with conducting-bars 13 of low resistance, fastened at one end to a conducting-ring 14 on the adjacent driving-sheave 3 or 4 and at the opposite end to a like ring 15 on a spider or disk 16, carried by a hub 17, adapted to revolve loosely upon the shaft 8. This constitutes a form of the well-known type of "mouse-mill" armature. It is shown in elevation in Fig. 3. As the poles 9 10 when duly energized revolve they set up induced currents of large volume in the bars 13, which react magnetically, with the result that the two armatures tend to accompany their respective sets of poles 9 10 in their revolution. It is obvious that while in the drawings I have shown for the sake of simplicity the bars 13 so disposed as to act at once as conductors and transmitters of mechanical effort to the sheaves 3 and 4 any other appropriate means for carrying out this latter function may be added without departing from

present invention. Since the two sets of poles revolve at the same speed, the relative rotative efforts exerted by them upon their respective armatures will be proportional to the total ampere-turns in their respective energizing-circuits. Hence by controlling the relative ampere-turns in the two circuits 11 and 12 the relative speeds of the two bights of the driving-cable are varied and the car is made to move up or down or is brought to rest. These changes are accomplished by any desired means, and in the drawings I have shown the circuits 11 and 12 brought out by means of collector-rings and brushes on each side to a common variable rheostat on the car.

The source of current is indicated at 18 and is connected by the wire 19 and branches 20 and 21 to one side of the circuits 11 and 12, respectively. The other pole of the generator 18 is connected to the bus-bar 22 on the rheostat. The bridging contact 23 is operated by the handle 24 to carry current from the bus-bar 22 to one or the other of the row of contacts 25, which latter are connected to successive points on the continuous resistance-coil 26. One end of this coil is connected by the wire 27 to the second extremity of the coil 11, and the other end of said resistance is connected by the conductor 28 to the second extremity of the coil 12. It will thus be seen that with the bridging contact in the middle position shown in the drawings the ampere-turns in the two transmission devices will be equal and although the motor 7 may be turning the cable 2 will run idly. Upon moving the handle 24, and therefore the contact 23, to one side or the other this equality in electromagnetic effort will be disturbed and one or the other of the sets of poles 9 10 will exert a superior effort upon its armature.

In the apparatus shown in Fig. 2 the same principles of operation obtain; but here a separate motor is used for driving each set of poles 9 10. These motors should run in the same direction for the specific arrangement of the cable 2 shown in Fig. 2; but by suitably modifying this cable arrangement the motors can be made operative when running in opposite directions. It is also obvious that the two motors need not be run at equal speeds, since the necessary relation of effort in the two electromagnetic transmission devices can be produced by suitable regulation of current corresponding to the inequality of speed.

My invention lends itself to use with single-phase alternating-current motors, since the prime mover or movers may be operated continuously in one direction and without change of speed. My invention is not restricted, however, to an apparatus involving use of any specific form of prime mover, and steam, compressed air, or water-power, for instance, may take the place of electricity in this connection. It is further obvious that in the electromagnetic transmission means the member directly driven by the prime mover need not necessarily be the inducing member, but that current may be supplied to the driven member in any well-known way, if desired.

I am not to be understood as restricting my claims to the specific embodiments of my invention herein actually shown and described, as various details thereof may be modified by mechanical skill without departing from my invention.

What I claim is—

1. In an elevator, a car, an endless driving-cable therefor arranged with two bights, a driving-sheave in each bight, a prime mover, an electromagnetic transmission means for each sheave one member of which means is driven by said prime mover and the other member of which is arranged to drive its appropriate sheave, and means for varying the relative efficiencies of said electromagnetic transmission means.

2. In an elevator, a car, an endless driving-cable therefor arranged with two bights, a driving-sheave in each bight, a prime mover for each sheave, an electromagnetic transmission means between each sheave and its own prime mover one member of which means is driven by its prime mover and the other member of which is arranged to drive its appropriate sheave, and means for varying the relative efficiencies of said two electromagnetic transmission means.

3. In an elevator, a car, an endless driving-cable therefor arranged with two bights, a driving-sheave in each bight, a prime mover, an electromagnetic transmission means for each sheave comprising an inducing member driven directly by said prime mover and an induced member arranged to drive one of said sheaves, and means for imparting various degrees of magnetic excitation to each of said inducing members at will.

4. In an elevator, a car, an endless driving-cable therefor arranged with two bights, a driving-sheave in each bight, a constantly-rotating prime mover, an electromagnetic transmission means for each sheave one member of which means is driven by said prime mover and the other member of which is arranged to drive its appropriate sheave and means for varying the relative efficiencies of said electromagnetic transmission means.

5. In an elevator, a car, an endless driving-cable therefor arranged with two bights, a driving-sheave in each bight, a prime mover, an electromagnetic transmission means for each sheave one member of which means is driven by said prime mover and the other member of which is arranged to drive its ap-

propriate sheave, an exciting-circuit on each of said transmission means, an electric generator one pole of which is connected to one end of each of said exciting-circuits, a resistance-coil having its opposite ends connected to the two other ends of said exciting-circuits and means for connecting the second pole of said generator to various parts of said resistance-coil between its ends at will for controlling said exciting-circuits.

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