No. 759,087. PATENTED MAY 3, 1904.

P. F. FOLEY.

ELEVATOR.

APPLICATION FILED DEC. 12, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

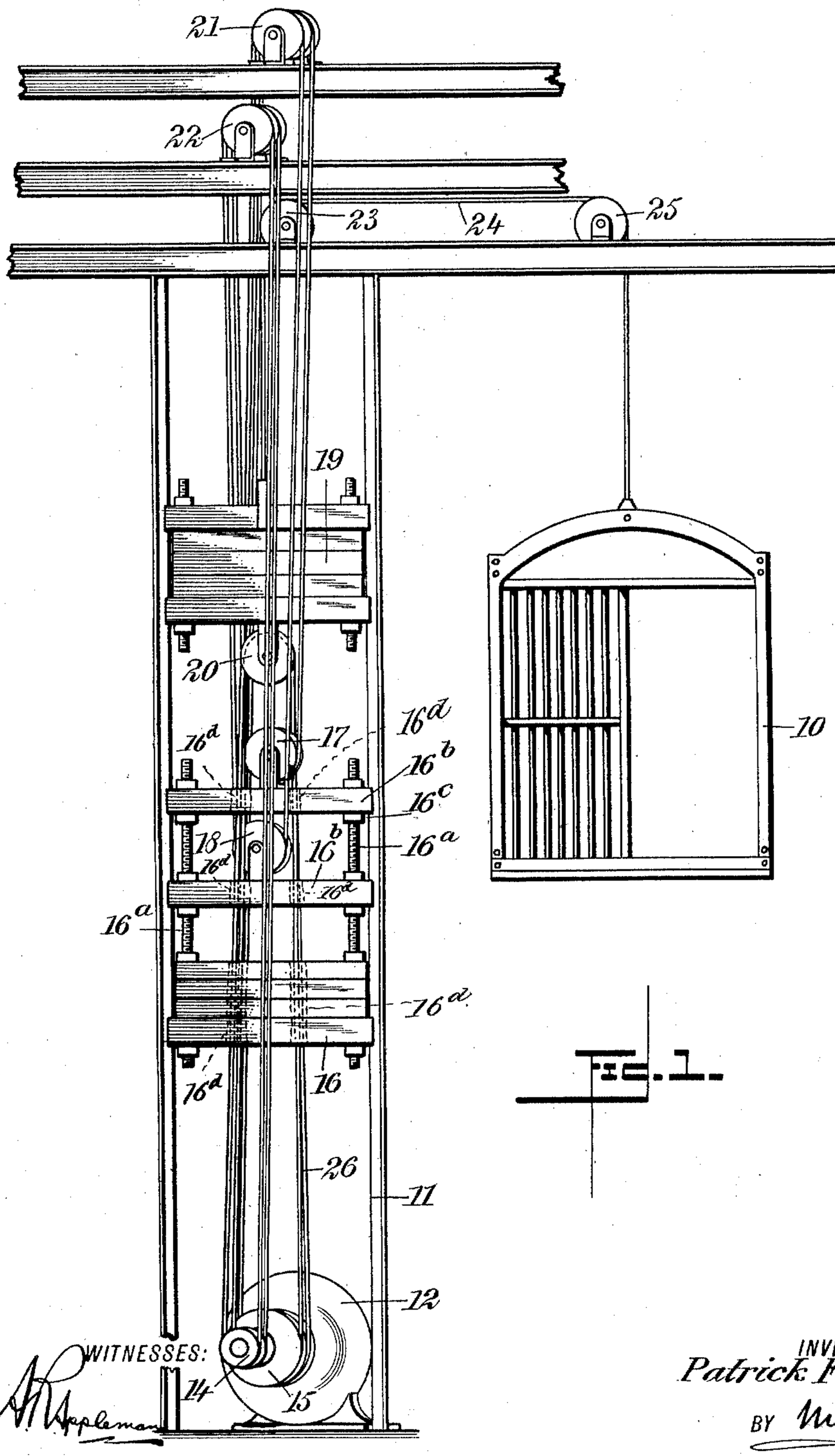

FIG. 1.

WITNESSES:

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Isaac B. Owens

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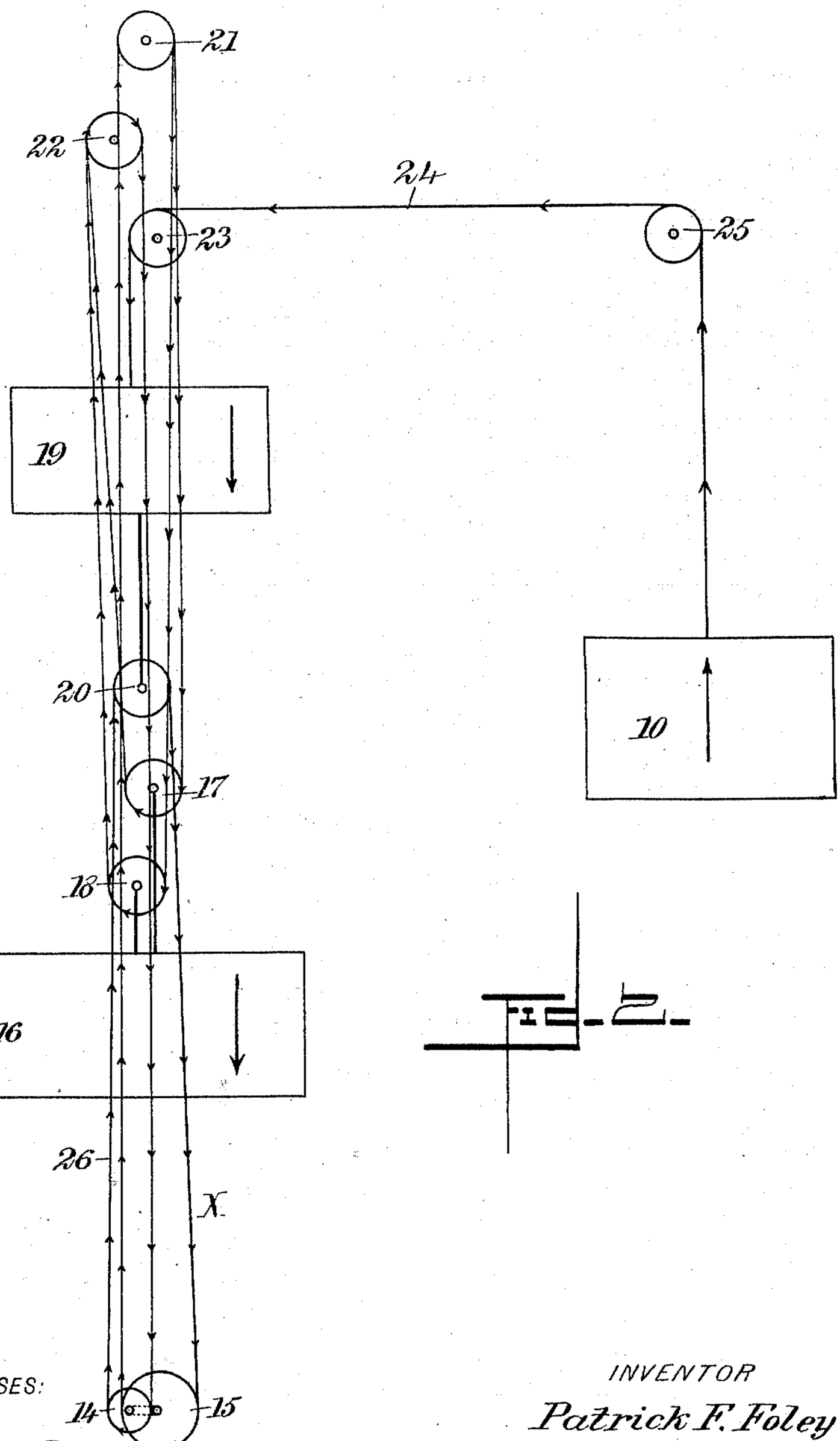

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UNITED STATES PATENT OFFICE.

PATRICK F. FOLEY, OF NEW YORK, N. Y.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 759,087, dated May 3, 1904.

Application filed December 12, 1903. Serial No. 184,918. (No model.)

To all whom it may concern:

Be it known that I, PATRICK F. FOLEY, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Elevator, of which the following is a full, clear, and exact description.

The invention relates to an improvement in the elevator disclosed in my prior patent, No. 746,663, dated October 27, 1903. In the apparatus shown in this patent a form of differential sheave and cable gearing is employed, involving a counterweight and a tension-weight mounted in two separate shafts or vertical guideways. This arrangement is disadvantageous in that considerable room is occupied in providing the two independent shafts.

The leading object of the present invention is to provide a construction which allows the sheave-weight and counterweight to move in the same shaft, thus very greatly economizing space in the building.

The invention involves other features, including a novel means for regulating the tension of the hoisting-cable, and all will be fully set forth hereinafter.

This specification is an exact description of one example of my invention, while the claims define the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is an elevational view of the elevator, and Fig. 2 is a diagrammatic view showing the sheaves and cables thereof.

Referring to Fig. 1, 10 indicates the car of the elevator, which is arranged to run in the elevator-shaft as usual. 11 indicates a shaft or guideway constructed alongside of the elevator-car. At the base of this shaft is a motor 12, on the shaft of which are arranged double-grooved differential sheaves 14 and 15. Above the motor 12 and movable within the shaft is the tension-weight, which may be of any desired form, but is preferably constructed of a number of weights proper, 16, connected by threaded bolts 16^a. To said bolts cross-bars 16^b are adjustably connected by means of nuts 16^c, and the cross bars 16^b respectively carry single-grooved sheaves 17 and 18. By these means the tension-weight is made to carry the sheaves 17 and 18 in such a manner as to permit the independent adjustment of each.

Above the tension-weight 16, within the shaft 11, is the counterweight 19. The counterweight has attached to its under side a double-grooved sheave 20. At the top of the shaft are supported two double-grooved sheaves 21 and 22, and slightly below these sheaves, but still at the top of the shaft, is a single-grooved sheave 23. Attached to the counterweight 19 is a cable 24, which passes upward over the sheave 23 and thence laterally over a sheave 25 down to the car 10, and by this means the car is suspended.

The various double-grooved sheaves 14, 15, 20, 21, and 22 and the single-grooved sheaves 17 and 18 are adapted to carry an endless cable 26. This cable is shown double in Fig. 1. It is clear, however, that the principle of the invention is not concerned with the number of parts to this endless cable. In the diagram Fig. 2 I have for convenience shown but a single cable, excepting where the two parts of the cable branch, as will be hereinafter more fully set forth. Referring to said figure, the course of this cable 26 may be traced as follows: Starting from the point X the cable passes downward over the double sheave 15, upward over the double sheave 21, where its two parts branch and pass downward, respectively, over the single sheaves 17 and 18. From the sheaves 17 and 18 the single parts of the cable pass up around the double sheave 22 and thence downward around the double small sheave 14, from which sheave the parts of the cable pass up around the double sheave 20 and thence down back to the point X. It will be observed that the sheaves 14 and 15, turning in the direction shown in Fig. 2, will, owing to the difference in their diameters, cause a downward movement of the parts 16 and 19, thus raising the car. As the movement of the sheaves 14 and 15 is reversed the movement of the car will be correspondingly changed, the operation in this respect being essentially the same as that in my prior patent.

Reference to Fig. 1 will show that these

several runs of the endless cable 26 pass on one side or the other of the counterweights, and the tension-weight is formed with vertical passages 16^d, (see the dotted lines in Fig. 1,) through which certain parts of the cable pass. This enables the cables to be properly disposed in the single shaft without interfering in any way with the proper movement of the sheave-frame and counterweight. It will also be seen that various of the sheaves are set on diagonal axes to accommodate the above-referred-to disposition of the parts of the cable. Further, it is clear that the tension and counter weights may be transposed in point of position without in any way departing from the principle of my invention.

It will be observed that the differential sheaves 14 and 15, acting with the tension-weight, cause the cable 26 to exert the necessary pressure on the counterweight. In this operation the sheaves 17 and 18 of the tension-weight hang in a loop in the endless cable 26, and in this way the cable is kept taut. Two or more cables are preferably employed, as shown in Fig. 1, the purpose of this being to increase the traction of the cables and also as a safety measure, since if one cable should break the other will still do its work. Since plural cables are employed, it is necessary to place an even tension thereon, and for this purpose the sheaves 17 and 18 are made adjustable on the tension-weight. Where only two cables are employed, the adjustment of one of the tension-weight sheaves is sufficient; but where three cables are employed two of the tension-weight sheaves must be adjusted to attain the end in hand. It is therefore for the purpose of adapting my invention to three endless cables 26 that I provide for the adjustment of both of the tension-weight sheaves.

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

1. In an elevator, the combination with the car, of a sheave having connection with the car, differential driving-sheaves, a tension-weight sheave, and a continuous endless driving-cable engaged with all of the sheaves, the said sheaves occupying essentially vertical alinement.

2. In an elevator, the combination with a car, of a shaft, a sheave mounted to run in said shaft and having connection with the car, differential driving-sheaves also mounted in the shaft, a tension-weight sheave also mounted to run in the shaft, and a continuous endless cable engaged with all of said sheaves.

3. In an elevator, the combination with the car, of a shaft, a counterweight sliding therein and having connection with the car, a sheave on said weight, a tension-weight also sliding in the shaft, a sheave on the tension-weight, differential driving-sheaves, and an endless cable engaged with all of the sheaves.

4. In an elevator, the combination with the car, of a shaft, a counterweight sliding therein and having connection with the car, a sheave on said weight, a tension-weight also sliding in the shaft, a sheave on the tension-weight, differential driving-sheaves, and an endless cable engaged with all of the sheaves, the said tension-weight having a passage or passages therein through which parts of the endless cable run.

5. In an elevator, the combination with the car, of a sheave connected thereto, a tension-weight, two sheaves adjustable thereon, differential driving-sheaves, and endless cables engaged with the first-named sheave and the driving-sheaves, and respectively engaged with the sheaves of the tension-weight.

6. In an elevator, the combination with the car, of a counterweight connected thereto, a sheave connected to the counterweight, a tension-weight, two sheaves adjustable on the tension-weight, differential driving-sheaves, and cables engaged with the counterweight and driving-sheaves, and respectively engaged with the sheaves on the tension-weight.

7. In an elevator, the combination with the car, sheaves and cable, substantially as described, of the weight, comprising the weight proper, a threaded rod engaged therewith, and a bar adjustable on the rod and carrying one of the said sheaves.

8. In an elevator, the combination with the car, sheaves and cable, substantially as described, of the weight, comprising the weight proper, threaded rods connected thereto, and a cross-bar extending between and adjustable on the rods and carrying one of the said sheaves.

9. In an elevator, the combination with the car, of a shaft, a counterweight movable therein, a connection between the counterweight and the car, a sheave connected with the said weight, a tension-weight also movable in the shaft, a sheave in connection with the tension-weight, differential driving-sheaves, and an endless cable engaged with all of the sheaves.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PATRICK F. FOLEY.

Witnesses:
ISAAC B. OWENS,
JNO. M. RITTER.