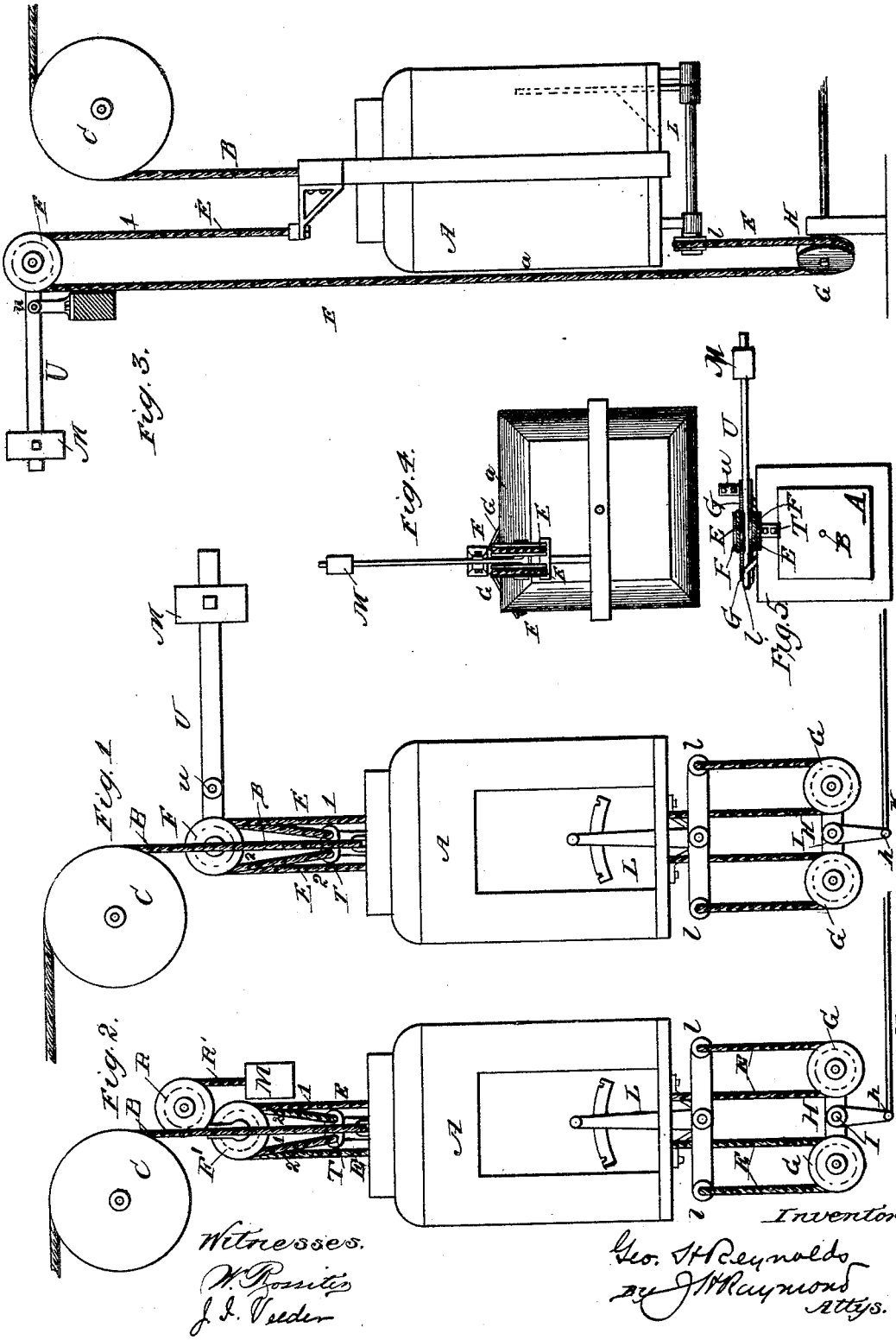
(No Model.) 2 Sheets—Sheet 1.

G. H. REYNOLDS.

CONTROLLING DEVICE FOR ELEVATORS.

No. 458,917. Patented Sept. 1, 1891.



Witnesses.
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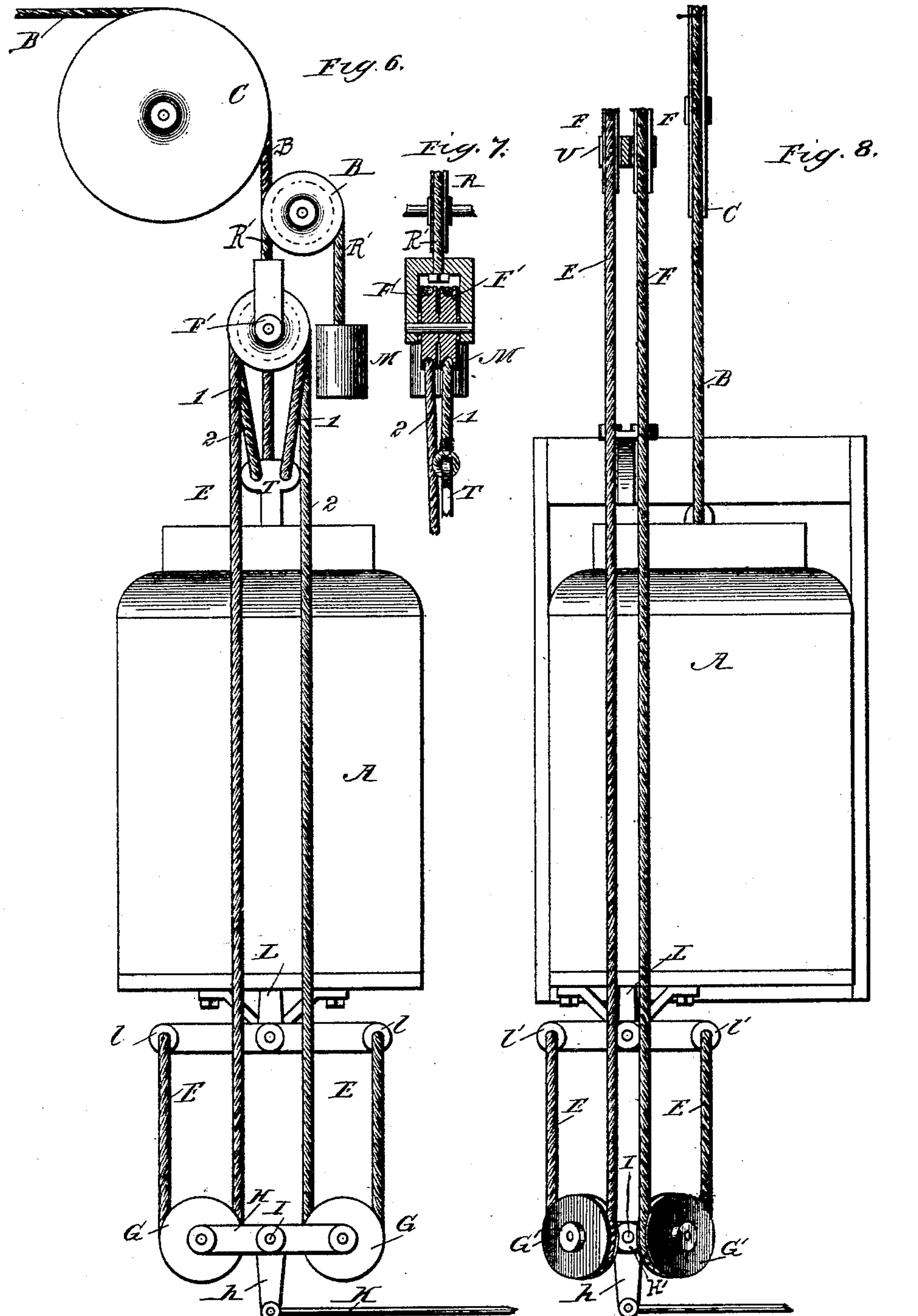

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UNITED STATES PATENT OFFICE.

GEORGE H. REYNOLDS, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL COMPANY, OF ILLINOIS.

CONTROLLING DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 458,917, dated September 1, 1891.

Original application filed January 26, 1887. Serial No. 225,538. Divided and this application filed June 29, 1887. Serial No. 242,859. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. REYNOLDS, of the city, county, and State of New York, have invented certain new and useful Improvements in Means for Controlling the Operation of Elevators, of which the following is a full specification.

My invention relates to that class of valve-operating gears in which cables running with the car are employed and especially to those devices in which both ends of each cable are fastened to the car.

My invention consists in the means for supporting the cables, so as to provide for maintaining a constant tension upon them notwithstanding variations in their lengths; and it further consists in the parts and combinations hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a side view of an elevator-car, the control-cables, and their connections. Fig. 2 shows a modification of the construction shown in Fig. 1. Figs. 3 and 4 are side and plan views, respectively, which show a compact and preferable arrangement of the control-cables. Fig. 5 is a plan view of the construction shown in Fig. 1. Fig. 6 is a back view of Fig. 2. Fig. 7 is a cross-section of pulleys F′ F′, Fig. 6, showing also some of their connections; and Fig. 8 is a view from the left side of Fig. 3.

A, Fig. 1, is an elevator-car suspended from the hoisting-rope B, which passes over the sheave C to the hoisting-engine, which may be of any kind—electric, steam, or hydraulic.

As my invention is adaptable to any kind of engine and control device, and as it is easily understood without showing the engine and device, these, together with other parts of the elevator not related to my invention, are omitted.

E E are the control-cables, each secured at one end to the car-body through the piece T or in any convenient way and at the other end to the take-up device—in this case a pivoted lever L, carried by the car. The cables E E pass around sheaves G G on the ends of the lever H, which is pivoted at I, and around sheaves F, located at the other end of the elevator-shaft. But one of the sheaves F is seen in the drawings, the other being immediately behind it. The upper ends of the cables are numbered 1 and 2 to show their course around the pulleys F F. The pulleys F F are attached to a lever U, having its fulcrum at *u*, and provided with a weight M. The weight M is made adjustable on the lever U, so as to adapt the strain upon the pulleys F F to the weight and length of the cables E E and to the power needed for operating the valve. The control-valve is connected to the arm *h* of lever H by the rod K. It is to be understood, however, that the use of the lever H or of the particular take-up device L is not necessary to my invention, the essential feature of which is the adaptation of the yielding pulleys F to the cables E to preserve their tension. The location of the tension-pulleys either in the top or bottom of the elevator-shaft is simply a matter of convenience. They are shown in the top of the shaft, as that is usually the preferable position; but in some cases it might be preferable to locate them in the bottom of the shaft—*e. g.*, if the lever H were located in the top of the shaft, as in Fig. 4 of the application filed contemporaneously herewith and numbered 242,858. It is obvious that if the tension-pulleys were located in the bottom of the shaft, then the fulcrum *u* would be placed at the extremity of lever U, and the pulleys F F would be placed between the fulcrum *u* and the weight M.

The operation will be readily understood from the foregoing description. Any movement of the lever L upon the car will produce a corresponding movement of the lever H through the shortening of the bight of one cable E and the lengthening of the bight of the other cable. The lever H, through its connections, will shift the control-valve. The tension-pulleys F F will take up all slack which might otherwise produce inaccuracy in the working of the apparatus, and will also yield if moisture or cold should cause shrinkage of the cables.

Fig. 2 differs from Fig. 1 in the substitution of a pulley R and rope R′ for connecting the weight M and pulleys F′ F′.

Figs. 3 and 4 show the control-cables, &c., as they are arranged in practice. The sheaves

G′ G′ are placed obliquely to the side of the car, the ends of lever H being bent for that purpose. A portion of both sheaves G G appears in Fig. 4, but only one sheave G and cable E show in Fig. 3, the other sheave and cable being directly behind them.

Fig. 8 shows both cables E E and pulleys G′ G′. The outer or farther edges of the sheaves G′ G′ are beneath the car in line with the arm *l′* of lever L. The inner edges of the sheaves G′ G′ project beyond the side *a* of the car. The sheaves F′ F′ are placed at right angles to the side *a* of the car. The cables pass from the ends of the cross-arm of the lever L to the outer edges of sheaves G′ G′, thence upward on the inner edges of sheaves G′ G′ to the sheaves F′ F′ and to the car. The cables are thus brought as close together as may be desired, and the length of the cross-arm *l′ l′* of lever L and of lever H′ may be determined without reference to the width of the car. This arrangement of pulleys G′ G′ and of the pulleys F′ F′, either or both, is applicable to other devices employing running cables, such as are shown in Patent No. 317,202, granted to me May 5, 1885, and those shown in the other applications filed contemporaneously herewith and serially numbered 242,858, 242,862, and 243,694.

If the pulleys G′ G′ were set obliquely but parallel to each other, the advantage of leading the cables to clear the side of the car would be gained, but they would not be brought nearer to each other, and hence this arrangement would generally not be so desirable, though, perhaps, preferable in special cases. By this combination, with the cable that operates the stopping and starting device of a yielding support counterweighted as set forth any slack resulting from use or temperature is at once taken up, so that the cables are maintained taut.

I claim—

1. The combination of a cage, two operating-cables connected to travel with the cage, supports for the cables, and a counter-weight for the supports, all substantially as described.

2. In an elevator-control mechanism having two control-cables attached to and running with the car, in combination with yieldingly-supported pulleys, as F F, adapted to rise and fall together, substantially as described.

3. In a cable-operating mechanism for elevators comprising two control-cables attached to the car, a weighted lever having sheaves over which the cables run for regulating and maintaining the tension of the cables, substantially as shown and described.

4. In an elevator-valve-operating mechanism, a pivoted lever connected with the control-valve, having sheaves set upon said lever obliquely to the plane of the side of the car, as and for the purpose set forth.

GEO. H. REYNOLDS.

Witnesses:
J. H. RAYMOND,
J. I. VEEDER.