(No Model.)

R. L. TEED.

ELEVATOR OPERATING MECHANISM.

No. 440,412. Patented Nov. 11, 1890.

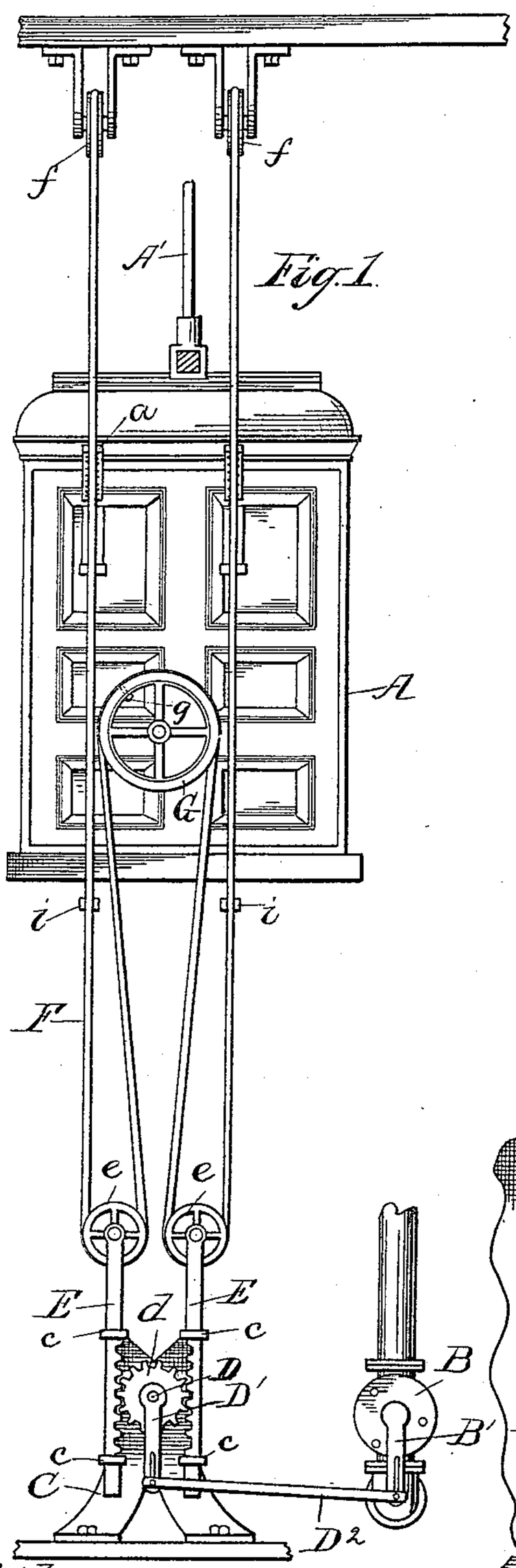

Fig. 1.

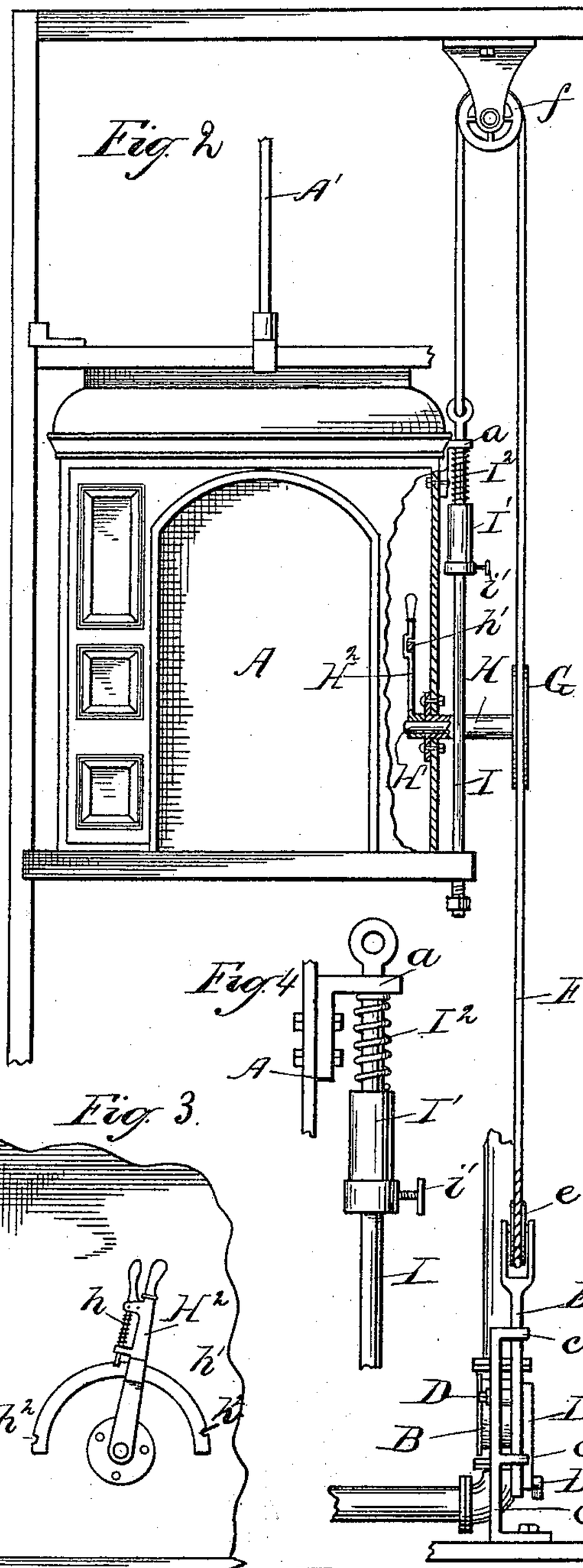

Fig. 2.

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

RALPH L. TEED, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO ALEXANDER McGUIRE, OF SAME PLACE.

ELEVATOR-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 440,412, dated November 11, 1890.

Application filed March 29, 1888. Serial No. 268,862. (No model.)

To all whom it may concern:

Be it known that I, RALPH L. TEED, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Valve-Operating Mechanism for Elevators, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of an apparatus embodying my invention; Fig. 2, a front elevation of the same; Fig. 3, a detail elevation of the hand-lever, and Fig. 4 a detail view of a portion of one of the draft-rods and its spring detached. Figs. 1 and 2 are on the same scale, while Figs. 3 and 4 are on an enlarged scale.

Like letters refer to like parts in all the figures of the drawings.

My invention relates to valve-operating mechanism for elevators, and has for its object to provide an efficient means whereby the valve which controls the hoisting mechanism of the elevator, which valve is permanently located at a point at or near the bottom of the elevator well or shaft, may be readily and efficiently operated from the moving elevator-car.

My invention has more particularly for its object to provide such a mechanism whereby the movement of a hand-lever within the car will be communicated to an equal extent to the valve, thereby obviating the necessity of moving the said lever a comparatively great distance in order to produce only a slight motion of the valve.

To these ends my invention consists in certain novel features, which I will now proceed to describe, and will then particularly point out in the claims.

In the drawings, A represents the elevator-car, which is raised and lowered by means of a suitable cable A′, operated by means of any suitable hoisting mechanism.

B represents the valve which controls this hoisting mechanism. This valve is preferably a rotary valve—such as is set forth in Letters Patent No. 379,617, granted to me March 20, 1888—although the said valve may be of any suitable construction. This valve is provided with an arm or lever B′, by means of which it is operated.

C represents a fixed standard mounted adjacent to the valve B at or near the bottom of the elevator-shaft. In this standard there is mounted a shaft D, provided with a crank-arm D′, which is connected to the valve-arm B′ by means of a connecting rod or link D^2. The arms B′ and D′ are preferably slotted, as shown in Fig. 1, so that the connecting rod or link D^2 may be adjustably connected to the said arms, in order to properly regulate their movement relatively to each other. On the shaft D there is mounted a gear-wheel or pinion *d*, and on each side of said pinion there is mounted a rack E, meshing therewith and capable of vertical movement through suitable guides *c* on the standard C. The racks E are each provided at their upper ends with a pulley-wheel *e*.

F represents a cable, the ends of which are attached to the car A in any suitable manner. Starting from one of its points of attachment to the car, the cable passes upward over a fixed pulley *f* at the top of the elevator-shaft, and then downward around one of the pulleys *e*, whence it is carried upward and passes around a wheel G, mounted on the car A, being preferably secured to the said wheel by means of a suitable fastening device *g*. From the wheel G the cable F passes downward around the other pulley *e*, and is then carried upward over a second pulley *f*, mounted at the top of the elevator-shaft, from which latter pulley it extends downward and is attached to the car A at its other end.

H represents a sleeve attached to the car A and forming a bearing for a shaft H′, which extends through said sleeve and has mounted on its outer end the wheel G. On the inner end of the shaft H′ there is mounted a hand-lever H^2, provided with a spring-locking bolt *h* of ordinary construction.

h′ represents an arc-bar provided with notches h^2, three in number and corresponding to the three positions which the valves B assumes in order to stop the car or move the same either upward or downward. The locking-bolt *h* by its engagement with the said

notches locks the hand-lever H^2 in these three positions.

The ends of the cable F are preferably connected to the car A by a yielding or spring connection, in order to obviate any jar to the valve-operating mechanism by reason of the sudden starting or stopping of the car. To effect this connection, I prefer the devices shown in the drawings, in which each end of the cable is connected to a draft-rod I, which passes loosely downward through a suitable guide *a* near the top of the car A, and also extends loosely through the bottom or flooring of the car, being provided at its lower end with a nut *i* to limit the upward motion of the rod.

I′ represents a collar adjustably mounted in the draft-rod I, being secured thereon after adjustment by a set-screw *i′*.

I^2 represents a spring coiled around the draft-rod I, its upper end abutting against the guide *a*, while its lower end abuts against the collar I′. These springs I^2 serve to thrust the draft-rod I normally downward and keep the cable F taut, while at the same time they serve to take up the strain of a sudden stopping or starting of the car, in which case it might be possible that a portion of the weight of the car would be transferred to the cable F.

The collars I′ may be made of a sufficient size to act as weights, in which case the springs I^2 may be dispensed with.

The operation of the mechanism is as follows: In the position of the parts shown in the drawings the car is stationary, with the lever H^2 in a central position. In case it is desired to start the car in either direction the lever H^2 is thrown over in the proper direction until its locking-bolt *h* engages with the notch h^2 of the arc-bar H′. This movement of the lever imparts a movement of rotation to the wheel G, and thereby, through the medium of the cable F, exerts an upward pull upon one of the racks E by reason of the said cable passing around the pulley *e* thereof. The said rack E is therefore moved upward, while at the same time the rack on the other side of the pinion *d* is moved downward to a corresponding extent, the wheel G paying out slack to allow this descent to the other rack. This movement of the racks E imparts a movement of rotation to the pinion *d*, and consequently to the shaft D, the arm D′ of which, by means of the link D^2, moves the arm B′ of the valve B to a corresponding extent. The valve B is thus moved into the proper position to impart to the car A the desired motion either in an upward or a downward direction. During the travel of the car the cable F runs freely over the pulleys *e* and *f*, whatever the position of the pulleys *e* and that of the wheel G may be. To arrest the movement of the car, it is only necessary to bring the lever H^2 back in the position shown in the drawings, when the other parts of the mechanism will be brought back into the position shown and the car will stop. By moving the lever H^2 in the opposite direction the valve B may be turned so as to move the car A in a corresponding direction. It will be observed that the parts may be so proportioned as to produce any desired extent of movement of the valve B in proportion to the movement of the lever H^2 within the car, and, owing to this fact, the action of the valve-operating mechanism is extremely quick and positive, since the action of the valve corresponds exactly in time and extent to the motion of the lever H^2.

I am aware of Letters Patent No. 334,907, granted January 26, 1886, to R. C. Smith, and I do not wish to be understood as claiming anything therein set forth.

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

1. The combination, with the valve, of a shaft arranged adjacent thereto and connected to the valve to operate the same, a pinion on said shaft, sliding racks arranged on opposite sides of said pinion and provided with pulleys, the car provided with a wheel, fixed pulleys at the top of the elevator-shaft, and a cable having its ends connected to the car and passing over the pulleys at the top of the shaft, around the pulleys on the racks, and around the wheel on the car, substantially as and for the purposes specified.

2. The combination, with the valve B, having arm B′, of the shaft D, having arm D′, the link D^2, connecting said arms, the pinion *d* on said shaft, the sliding racks E, meshing with opposite sides of said pinion and provided with pulleys *e*, fixed pulleys *f*, the car A, provided with shaft H′, having wheel G and hand-lever H^2, and the cable F, having its ends connected to the car and passing around the pulleys *e* and *f* and wheel G, substantially as and for the purposes specified.

3. The combination, with the valve B, having slotted arm B′, of the shaft D, having slotted arm D′, the link D^2, adjustably connecting said arm with slotted arm B′, the pinion *d*, racks E, and a suitable cable connected to the car for operating said racks in opposite directions, substantially as and for the purposes specified.

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