No. 679,361. Patented July 30, 1901.

A. T. BROWN.

CONTROLLING MECHANISM FOR ELEVATORS.

(Application filed June 30, 1900.)

(No Model.) 2 Sheets—Sheet 1.

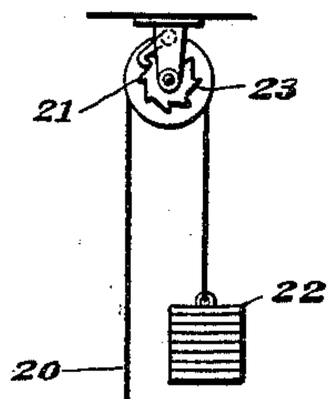
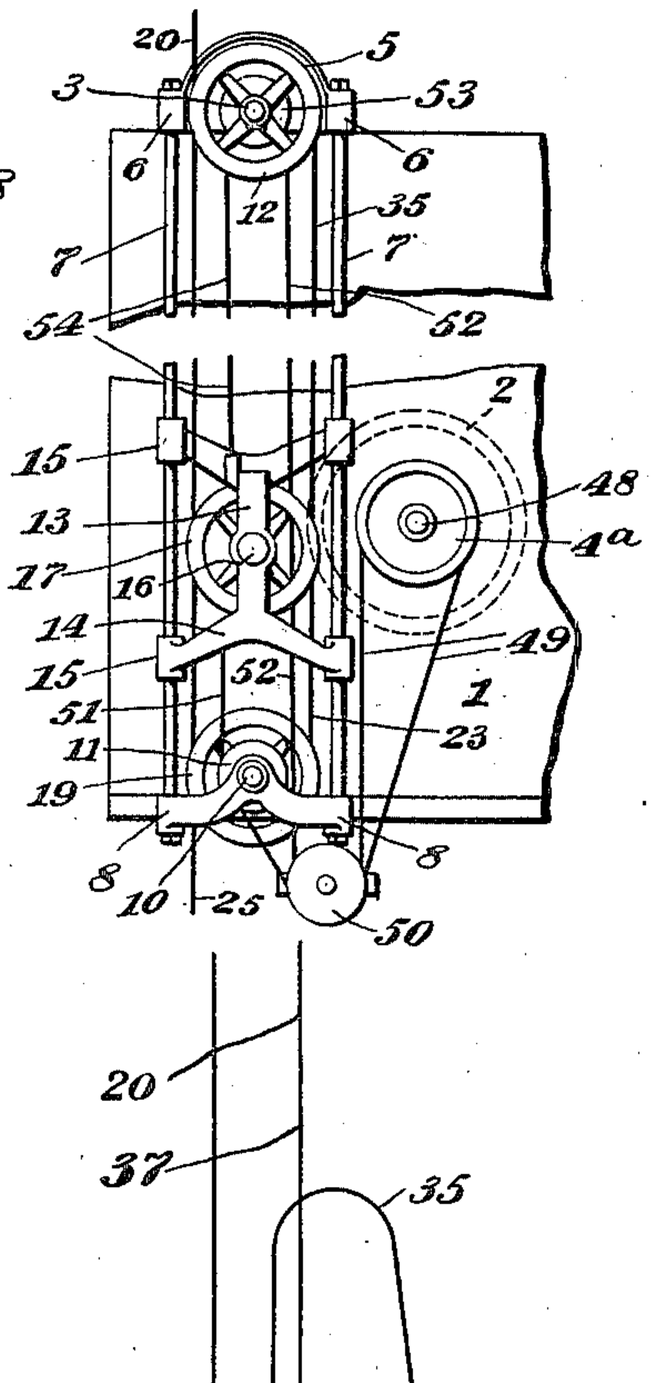


Fig. 1

Fig. 8



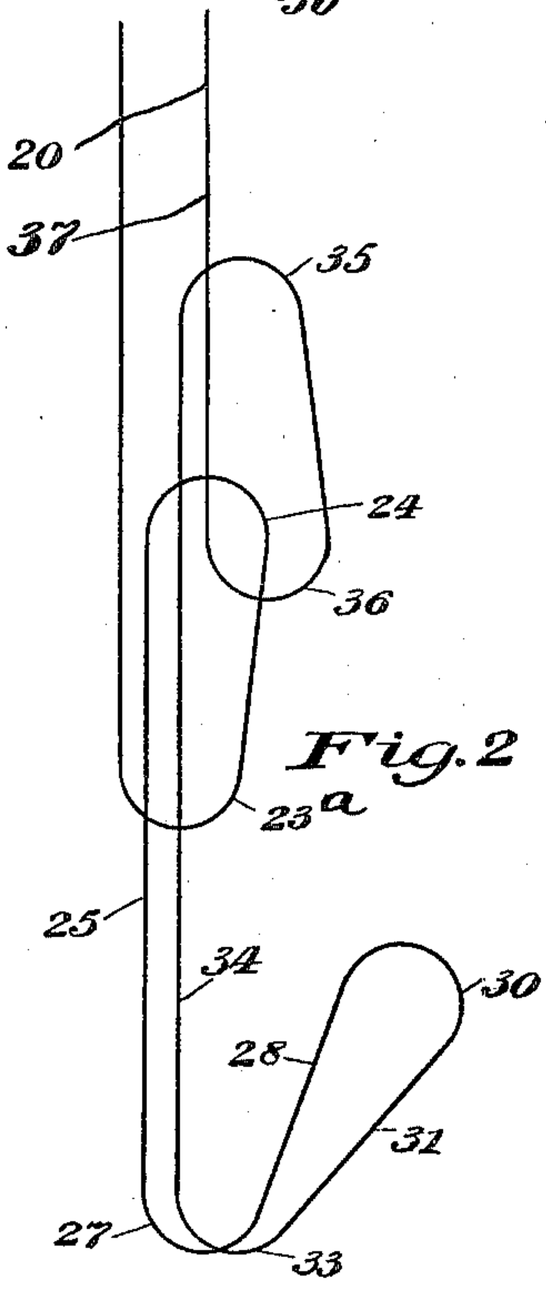


Fig. 2

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Fig. 5

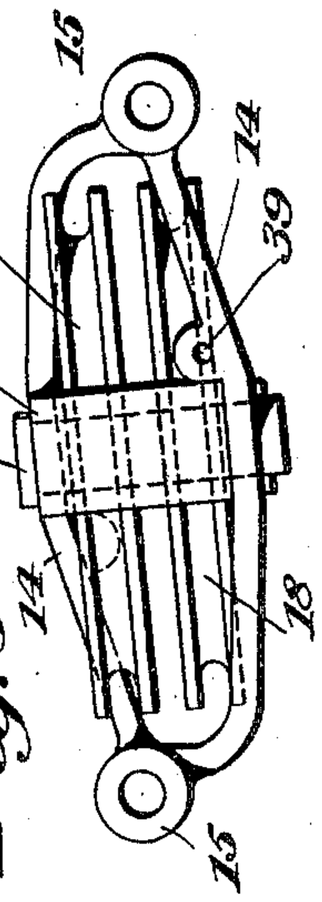

Fig. 6

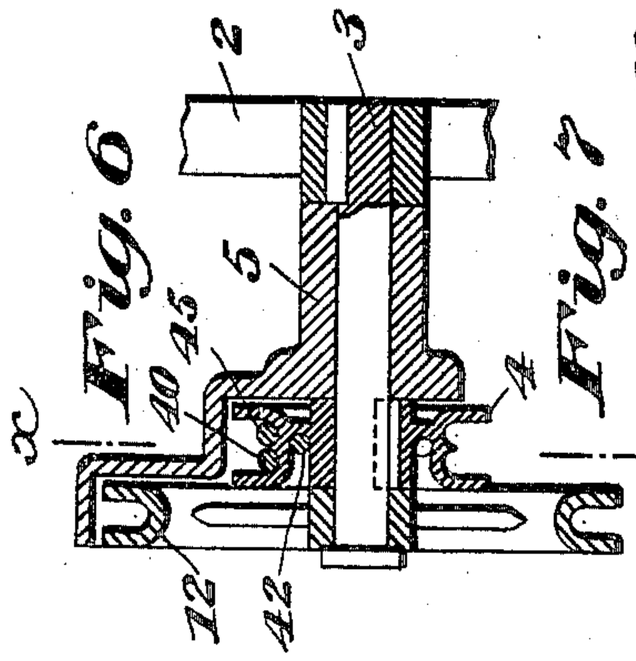

Fig. 7

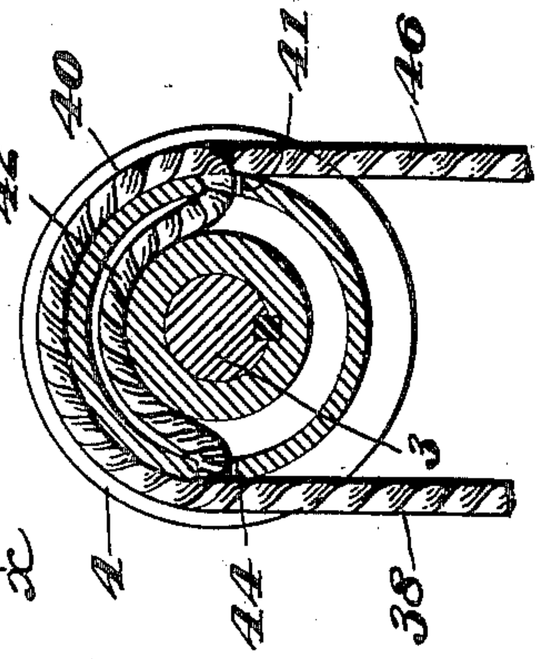

Fig. 4

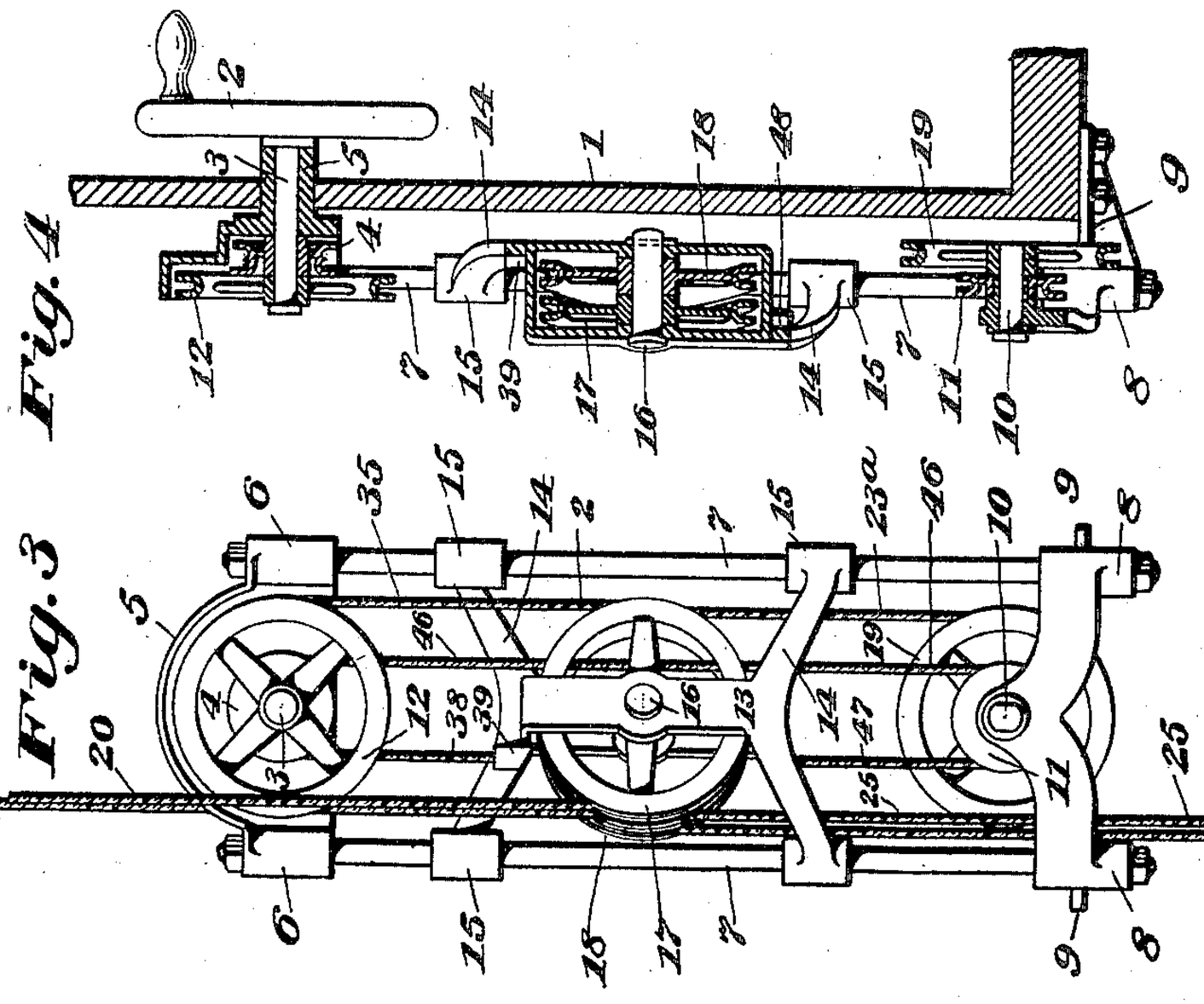

Fig. 3

Witnesses
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Inventor
Alfred T. Brown,
by John Cleon Jones,
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UNITED STATES PATENT OFFICE.

ALFRED T. BROWN, OF CINCINNATI, OHIO, ASSIGNOR TO THE WARNER ELEVATOR MANUFACTURING COMPANY, OF SAME PLACE.

CONTROLLING MECHANISM FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 679,361, dated July 30, 1901.

Application filed June 30, 1900. Serial No. 22,135. (No model.)

To all whom it may concern:

Be it known that I, ALFRED T. BROWN, a citizen of the United States of America, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Controlling Mechanism for Elevators, of which the following is a specification.

This invention relates to certain improvements in controlling mechanism for elevators, and has for its object to provide a mechanism of this character of a simple and inexpensive nature and of a strong, compact, and durable construction, capable of ready application to meet varying requirements and not liable to become deranged or inoperative when in use, whereby the liability to accidents and breakdowns is avoided.

The invention consists in certain novel features of the construction, combination, and arrangement of the several parts of the improved controlling mechanism, whereby certain important advantages are attained and the device is made simpler, cheaper, and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my invention, Figure 1 is an elevation drawn to a small scale and showing an elevator-cab provided with a controlling mechanism constructed according to my invention, and Fig. 2 is a diagram showing the bends or bights of the controller rope or ropes in the improved mechanism. Fig. 3 is an enlarged elevation showing the portions of the controlling mechanism carried on the cab. Fig. 4 is a mid-section taken vertically through the devices shown in Fig. 3. Fig. 5 is an enlarged plan view showing the traveling frame of the device detached from its guiding means. Fig. 6 is an enlarged partial section taken in the plane of the section shown in Fig. 4 and showing the sheave and drum at the upper part of the devices carried on the cab. Fig. 7 is an enlarged sectional detail view taken through the drum in the plane indicated by line *x x* in Fig. 6 and showing the means for connecting the tiller-rope thereto. Fig. 8 is a partial view, somewhat similar to Fig. 1, but showing a modified form of the controlling mechanism adapted for use where a greater extent of movement of the controller rope or ropes is required.

In the views, 1 indicates the cab of the elevator, and 2 indicates any suitable device located therein—as, for example, a pilot-wheel adapted to be turned by the attendant in order to actuate the controlling mechanism. The wheel 2 is secured on an operating-shaft 3, extended through the wall of the cab and carrying at its outer part a drum 4, fixed on said shaft and on which the tiller-rope is adapted to be wound, as will be hereinafter explained. The shaft 3 is, as herein shown, held in a bearing-bracket 5, secured to the wall of the cab and provided with oppositely-extended arms 6 6, having sockets to receive the upper ends of guide-rods 7 7, which extend parallel to each other and vertically down the wall of the cab and are held at their lower ends in sockets at opposite sides of a bracket 8, having flanges 9, bolted to the under side of the cab, as clearly shown in Fig. 4. The lower bracket 8 has at its central part a bearing in which is held a shaft 10, whereon is loosely mounted a sheave or drum 11 of substantially the same diameter as the upper drum 4, being, like said drum 4, grooved on its periphery to receive the tiller-rope.

On the outer end of the upper shaft 3 is loosely mounted an idler sheave or pulley 12, and on the lower shaft 10 is fixed a similar sheave or pulley 19, these pulleys or sheaves 12 and 19 being at opposite ends of the guides 7, as are also the drums 4 and 11, and being located in different vertical planes, as shown in Fig. 4 of the drawings. Between the sheaves or pulleys 12 and 19 is arranged a traveling frame 13, having at top and bottom cross-heads or yokes 14, which extend laterally at opposite sides of the body portion of said frame, and have at their ends slide-bearings 15, through which are passed the guide-rods 7 7, on which said frame 13 is thus adapted for vertical movement. The body portion of the traveling frame 13 consists of an open rectangular part central between the guide-rods 7 7 and carrying a horizontal shaft 16, arranged at an angle to the upper and lower

shafts 3 and 10. On the shaft 16 are loosely mounted independently-rotatable traveling idlers or sheaves 17 and 18 of equal diameters. The angle of the shaft 16 relative to the shafts 3 and 10 is such that one side of the idler sheave or pulley 17 on shaft 16 is caused to stand outside the plane of the upper sheave or pulley 12, so as to permit a controller-rope to pass down outside of and clearing the said upper sheave 12 and around under the sheave 17 on shaft 16, while the other side of said sheave 17 (the left side, as shown in Figs. 1 and 3) is caused to stand directly beneath and in line with the upper pulley or sheave 12, so as to permit the controller-rope to be passed upward from the sheave 17 to and around over the upper sheave 12. In a similar manner the one side of the pulley 18 on shaft 16 is caused to stand out of line with the lower pulley 19 to permit the rope passed over said pulley 18 to be carried down past and clear of the said lower pulley 19, while the left-hand side of pulley 18, as the parts are shown in Figs. 1 and 3, is caused to stand in line directly over the pulley 19 to receive the rope carried up therefrom. The angular arrangement of the shaft 16 and its pulleys or sheaves 17 and 18 is clearly shown in Fig. 5. The cross-heads or yokes 14 at top and bottom of the traveling frame 13 are also arranged out of alinement with each other, so as not to interfere with the passage of the controller rope or ropes between the several pulleys.

As herein shown, a single controller-rope is employed, bent into two runs and having its bight, which is, as herein shown, at the foot of the well, passed around the valve-wheel in a well-known way; but it is evident that the two runs of the single rope herein shown may be replaced by two independent ropes, and in some cases the valve-wheel or equivalent device may be at the top of the well.

Each end of the controller-rope at the upper end of the well is bent around a drum or sheave 21 and connected to a weight 22, a ratchet-and-pawl attachment 23 being provided for preventing back rotation of said drum or sheave. This arrangement affords a compensating device adapted to automatically take up any slack which may be in the controller-rope, so as to hold the same taut at all times. If desired, where a single rope is employed, as herein, but one end of the same may be provided with such a compensating device, the other end being secured in any desired way at the top of the well.

One run of the controller-rope extends down from its compensating device, as indicated at 20, and is bent around under the sheave 17 of the traveling frame, as indicated at 36 in the diagram Fig. 2. Thence it extends upward and is bent around over the upper idler-sheave 12, as indicated at 35 in Fig. 2, and thence it extends down, as indicated at 34, and is passed beneath a sheave 26 at the foot of the well, as seen at 33 in Fig. 2, and thence it is passed, as shown at 31, upward and around the valve wheel or drum 29 of the elevator-engine, as shown at 30 in Fig. 2. From the valve-wheel 29 the other run of the controller-rope extends down, as indicated at 28, beneath an idler similar to idler 26, as shown at 27 in Fig. 2, and then upward in the shaft, as indicated at 25, around over the sheave 18 of the traveling frame, as shown at 24 in Fig. 2. Thence it extends down, as shown at 23^a, and around under the lower idler-sheave 19, and thence upward, as shown at 37, to the compensating device at the top of the well. Thus it will be seen that the two runs of the controller-rope are each provided with a closed or complete bight or loop which passes around one of the sheaves of the traveling frame and one of the idler-sheaves 12 and 19 above and below said frame, and by reason of the connection between said runs and the valve-wheel or equivalent part of the elevator motor or engine it will be apparent that when one of said bights is enlarged by moving the traveling frame in one direction it will operate to contract the bight or loop of the other run. In order to thus enlarge and contract the bight or loops of the runs of the controller-rope, and thereby to move the valve-wheel or equivalent part, I provide a tiller-rope having one end portion 38 connected, as shown at 39 in Fig. 3, to the upper part of the traveling frame 13 and passed over the drum 4, as shown at 40 in Fig. 7, to which drum it is secured by being passed through an opening 41 into an interior hollow of the drum 4, as shown in Fig. 6. Through said hollow the tiller-rope is carried across, as shown at 42, to the opposite side of the drum 4 through an opening 44 and over the outside of the drum, as shown at 45 in Fig. 6. From the drum 4 the tiller-rope is extended down, as shown at 46, under and around the lower drum 11 and thence upward, as shown at 47, having its end connected to the lower part of the traveling frame 13. Thus it will be seen that when the pilot-wheel 2 in the cab is turned the movement will be imparted to the traveling frame to raise or lower the same through the connections of the shaft 3, drum 4, and the tiller-rope, and thereby one of the bights of the controller-rope will be enlarged, so as to turn the valve-wheel in one direction, the other bight of said controller-rope being contracted at the same time to permit such movement of the valve-wheel by lengthening the run of the rope wherein it is produced.

In cases where a greater movement of the valve-wheel is desired the construction shown in Fig. 8 may be employed, the bearing-bracket 5 being carried up and secured to the upper part of the cab to permit the guide-rods 7 to be made of greater lengths, whereby increased travel may be imparted to the frame 13. The pilot-wheel 2 in the cab is mounted on an independent shaft 48, having a drum

4ª outside the shaft, from which the tiller-rope is carried down, as indicated at 49, beneath guide-wheels 50 at the lower part of the cab. One run of the said tiller-rope passes under the lower drum 11 and up, as shown at 51, and is secured to the lower part of the traveling frame 13, while the other run 52 of said rope passes up over the upper drum 53 and thence extends down, as shown at 54, and is connected to the upper part of the frame 13. The construction and operation are otherwise similar to the device above described except that a greater extent of movement of the valve-wheel is permitted by lengthening the play of the traveling frame 13.

The improved controlling mechanism constructed as above described is of an extremely simple and inexpensive nature and is, moreover, strong and compact in construction and is capable of adjustment to varying conditions, such as may be caused by different lengths of movement required in the controller-rope, so as to render it very desirable for use in elevator construction. It will also be apparent from the above description that the improved controlling mechanism is capable of considerable modification without material departure from the principles and spirit of the invention, and for this reason I do not wish to be understood as limiting myself to the precise form and arrangement of the several parts herein shown in carrying out my invention.

Having thus described my invention, I claim—

1. A controlling mechanism for elevators comprising a controller-rope formed in two runs extended in the well and connected to a valve-wheel or the like, each run having a bight produced in it, two sheaves on the cab for each bight, one sheave of each bight being movable, and an operating device having a tiller-rope, the tiller-rope having each end connected to the movable sheave of both bights to move the movable sheaves simultaneously to enlarge one bight and contract the other bight of the controller-rope, substantially as set forth.

2. A controlling mechanism for elevators comprising a controller-rope formed in two runs extended in the well and connected to a valve mechanism or the like, each run having a bight produced in it, two idler-sheaves on the cab, one for the bight of each run of the controller-rope, a traveling frame on the cab having a sheave for the bight of each run of the controller-rope and an operating device having a tiller-rope connected to the traveling frame and adapted for operation to enlarge one bight and contract the other bight of the controller-rope, substantially as set forth.

3. A controlling mechanism for elevators comprising a controller-rope formed in two runs extended in the well and connected to a valve mechanism or the like, each run having a bight produced in it, guides, a frame movable on said guides and having a sheave for the bight of each run of the controller-rope, a sheave at each end of the guides for one of the bights of the controller-rope and an operating device having a tiller-rope connected to the traveling frame and adapted for operation to move the same to simultaneously enlarge and contract the respective bights of the controller-rope, substantially as set forth.

4. In a controlling mechanism for elevators, the combination of guides carried by the cab, idler-sheaves at the ends of the guides, a traveling frame mounted for movement on the guides and provided with two sheaves, a controller-rope passed over the idler-sheaves and the sheaves of the traveling frame, an operating device carried on the cab and a flexible connection between said operating device and the traveling frame and passed over the said idler-sheaves, substantially as set forth.

5. In a controlling device for elevators, the combination of idler-sheaves carried by the cab and arranged in different planes, traveling sheaves arranged at angles to said idler-sheaves and each having one side alined with one of said idler-sheaves, a traveling frame on which both traveling sheaves are carried, a controller-rope having its runs each passed around one of the traveling and one of the idler sheaves, and means for moving the traveling frame, substantially as set forth.

6. In a controlling mechanism for elevators, the combination of a controller-rope, means for moving the same, an operating device carried on the cab and comprising a drum having openings in its periphery and provided with a passage connecting said openings, and a tiller-rope passed around the drum and through the openings and passage thereof and having its end portions connected with the means for moving the controller-rope, substantially as set forth.

7. In a controlling device for elevators, the combination of idler-sheaves, a traveling frame arranged for movement between the idler-sheaves and provided with two sheaves, a controller-rope passed over the idler-sheaves and the sheaves of the traveling frame, shafts at the ends of the path traversed by the traveling frame, drums on said shafts, a tiller-rope connected to one drum with one end connected to one end of the traveling frame and its other end passed around the other drum and connected to the other end of the traveling frame, and an operating device carried in the cab and connected to the shaft of the drum to which the tiller-rope is connected, substantially as set forth.

8. In a controlling mechanism for elevators, the combination of an operating-shaft, guides, a traveling frame movable thereon and provided with two sheaves, sheaves at the ends of the guides, a controller-rope formed in two runs each having a bight passed over one sheave of the traveling frame and the sheave

at one end of the guides thereof, drums at the ends of the guides, one drum being connected to the operating-shaft, and a tiller-rope having its ends connected to the traveling frame, said tiller-rope being passed over the drums at the ends of the guides, substantially as set forth.

9. In a controlling mechanism for elevators, the combination of idler-sheaves on the cab, a traveling frame movable between the idler-sheaves and provided with a single shaft, two independently-rotatable sheaves on said shaft, a controller-rope having its runs each carried over one of the idler-sheaves and one sheave of the traveling frame, an operating device and a tiller-rope connected to said operating device and having each end connected to the traveling frame, substantially as set forth.

10. A controlling mechanism for elevators comprising a traveling frame adapted for movement upon an elevator-cab, two sheaves carried by said traveling frame and adapted for independent rotation and each adapted for the passage of one bight of a controller-rope, drums at the ends of the path traversed by said traveling frame, a tiller-rope passed over said drums and having its ends oppositely connected to the traveling frame and an operating device for moving the tiller-rope, substantially as set forth.

Signed by me at Cincinnati, Ohio, this 18th day of June, 1900.

ALFRED T. BROWN.

Witnesses:
JOHN ELIAS JONES,
J. D. THORNE.