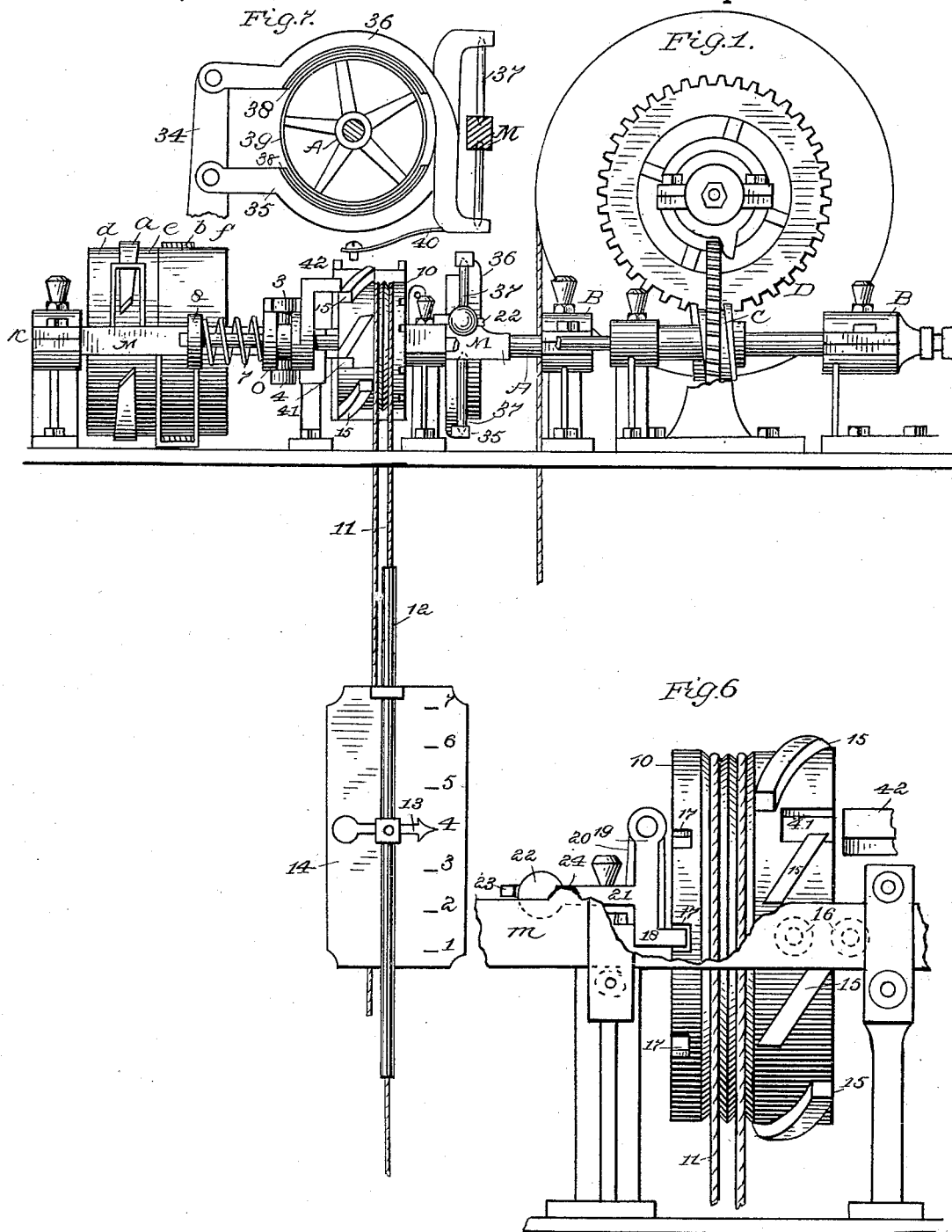


G. R. PEARE.

ELEVATOR.

No. 264,745.

Patented Sept. 19, 1882.



Attest:
Walter Donaldson
F. L. Middleton

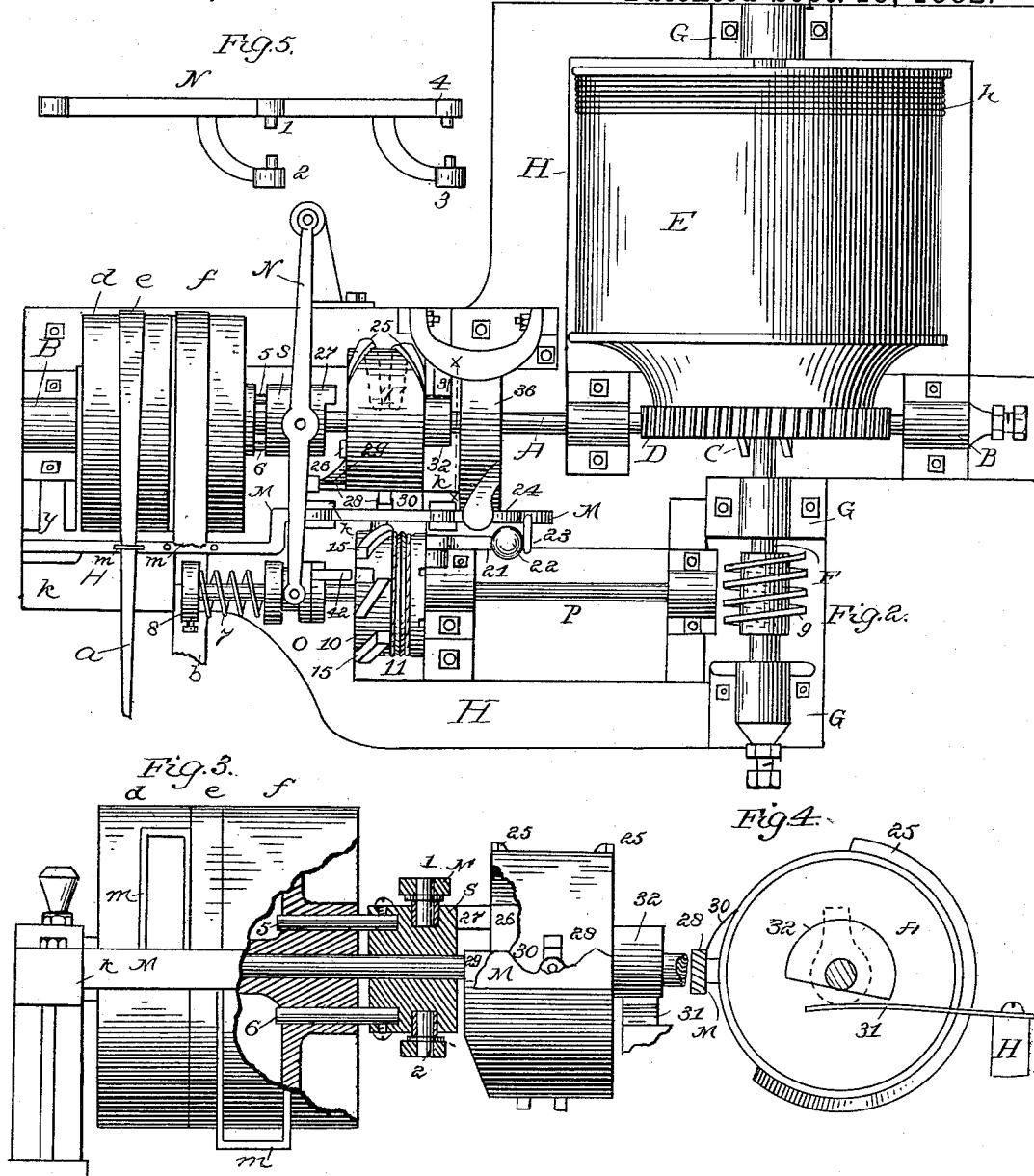
Inventor
George R. Peare
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ALC

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Walter D. Malcom
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Inventor
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UNITED STATES PATENT OFFICE.

GEORGE R. PEARE, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GEORGE C. TEWKSBURY, OF SAME PLACE.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 264,745, dated September 19, 1882.

Application filed February 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. PEARE, a citizen of the British Empire, residing at Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Elevators, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to that class of elevators commonly used in buildings for carrying merchandise from one story or floor of the building to another, and has for its object, first, to provide a stopping mechanism which may be set at any one story in the building for any other story in the building and operate upon the shipping mechanism so as to cause the elevator-box to automatically stop when it reaches the designated story; and, secondly, to provide mechanism whereby the elevator, when once set in motion, is prevented from being stopped or started in the opposite direction until it has completed the journey on which it started.

The invention consists in the peculiar and novel construction and combination of parts, as hereinafter fully set forth and specifically claimed.

In the accompanying drawings, Figure 1 is a side elevation of my improved elevator mechanism. Fig. 2 is a plan view of the same. Fig. 3 shows a side elevation of a detached portion of the mechanism, and is drawn partly in section to exhibit detail. Fig. 4 is a right end elevation of Fig. 3. Fig. 5 gives a side elevation of the lever N (see Fig. 1) detached from the other parts. Fig. 6 shows a side elevation of the shipping mechanism and its locking device, the side shown being opposite to that shown in Fig. 1. Fig. 7 is a cross-section, made on dotted line *xx*, Fig. 1, and shows a side view of the brake device for stopping the momentum of the elevator.

The shaft A turns in bearings B B B, which are mounted upon an angular frame, (designated by the letter H,) placed upon different parts thereof. It carries a worm, C, that engages with the gear D, secured to the end of hoisting-drum E, which said drum is mounted upon a cross-shaft, F, that turns in bearings G G G, Fig. 2. Motion is imparted to the shaft

A by means of the belts *a* and *b*, which travel in opposite directions, in reference to each other, about the pulleys *d e f*. Said pulleys are arranged upon the shaft A, with the center member, *e*, fixed upon and the end members, *d* and *f*, arranged to turn freely about the shaft. The shaft is still so long as the belts *a b* remain on the loose pulleys, but it is made to revolve by moving either of said belts onto the center or tight pulley, *e*. This motion of the shaft A is communicated through the worm C and gear D to the drum E, so as to wind or unwind the cord *h* about said drum, and thereby raise and lower the elevator-box, (not shown,) which is attached to the end of the cord *h* in the usual and obvious manner. The belts *a* and *b* turn the shaft A in opposite directions, (in reference to each other,) so as to raise or lower the elevator-box, as occasion requires. The belts *a* and *b* are shifted from one pulley to the other by means of the horizontal shipper-bar M, which is supported by standards *k k k*, (see Fig. 2,) and, being provided with belt-guides *m*, is horizontally movable in its bearings, which consist of grooves cut in the top ends of the supporting-standards *k k k*.

Fig. 5 shows side elevation of a lever bar, N, which is provided with two arms—one located at or near its center and the other at or near its end. It embraces, by means of the arms at its center, the clutch-wheel S, the pins 1 and 2 on the lever being allowed to enter a suitable groove in the clutch, as shown in Fig. 3. Said wheel S is mounted loosely upon the shaft A, so as to permit a free lateral movement thereon. It is provided with horizontal pins 5 and 6, that enter corresponding holes in the hub of loose pulley *f*, Fig. 3. It is by this means compelled to revolve with the said pulley *f*, and the said pulley *f* is revolved, as before stated, by belt *b*, which is made sufficiently wide to embrace the pulley *e* and a portion of the pulley *f* at one time, thus insuring a continuous revolution of the said pulley *f*, and through it the clutch S. The lever N embraces, by means of the arms at its end, a clutch-wheel, O, that is mounted upon the horizontal shaft P, the pins 3 and 4 in the lever being allowed to enter a groove in the clutch-wheel O. Said wheel

O may be and is combined with the shaft P by means of the ordinary spline-and-key contrivance, whereby it is made to revolve with the shaft P, and at the same time permit of free lateral movement thereon. A spiral spring, 7, surrounds the shaft P and bears one end against the disk 8 on the end of the shaft and its opposite end against the said wheel O, and thereby tends to give the said wheel O a right lateral movement on the shaft P. Motion is imparted to the shaft P from the shaft F through the intermediate worm, 9, or said shaft F and a corresponding wheel on the end of shaft P. Said worm and wheel are proportioned to each other so as to cause a complete revolution of the shaft P while the elevator-box passes from one end of the elevator-well to the other—that is, from the top to the bottom story in the building, or vice versa.

On the shaft P is a cylindrical drum, 10, which is arranged to turn loosely on the shaft P, and is surrounded by a practically non-elastic cord, 11, the ends of which extend down through the building in close proximity to the elevator-well from one extremity thereof to the other. At each story of the building an indicator is arranged in connection with this cord, whereby the position of the elevator, as well as its destination, is determined, as referred to hereinafter. Said indicator is composed of a hollow pipe, 12, a pointer, 13, and plate 14, on which is marked a scale, numbered from 1 upward, there being as many numbers as there are stories in the building which contains the elevator. These elements are combined with the cord 11 and with each other, as shown in Fig. 1, the pipe 12 being attached to one line of the cord, while the plate is secured to the other. It will now be evident that a pull upon either line of the cord 11 will revolve the drum 10 on the shaft P, and at the same time change the position of the pointer on the scale-plate 14.

The periphery of the drum 10 is divided into as many equal parts as there are stories or stopping-places for the elevator, and on the lines which mark these several divisions are cam-leaves 15, arranged diagonally across the drum and in reference to each other, substantially as shown. These said leaves are adapted to engage with a pin, 16, that projects from the shipper-bar M, so that when the drum 10 is revolved by pulling the cord 11, as stated, the said cam-leaf 15, that first strikes the pin 16, operates against the pin so as to push along the shipper-bar M and change the position of the driving-belts *a* and *b*, thereby setting the elevator in motion. The direction in which the shipper-bar M, and consequently the elevator, shall move is determined by the direction in which the drum 10 is revolved.

In one side or edge of the drum 10 is a series of notches, (marked 17,) which are designed to receive the tooth 18 on ratchet 19, which said ratchet is pivoted to the standard 20. The ratchet is further provided with a projecting arm, 21, on which is a weight, 22. At the end of the arm is an offset, 23, that extends over

so as to slide on the top edge of the shipper-bar M. (See Fig. 2.) On the said top edge of the shipper-bar M is a boss or cam-cheek, 24, arranged on the bar and in reference to the offset, so that while the elevator is at rest—that is, while the driving-belts are on their respective loose pulleys *d* and *f*—the offset rests upon the top of the boss 24, and is held upward thereby, so as to prevent the ratchet-tooth 18 from entering the notches in the drum 10. In this position the drum 10 is free to be revolved in either direction; but a movement of the shipper-bar M in either direction for the purpose of starting the elevator carries the boss 24 away from under the offset 23 and allows it to drop, thereby permitting the ratchet-tooth 18 to enter some one of the notches in drum 10, as shown in Fig. 6, in which position the drum is securely locked until the shipper-bar M is reversed for the purpose of stopping the elevator, when the cam-cheek or boss 24 again comes under the offset 23, so as to lift the ratchet-tooth 18 out of its socket, and thereby release the drum 10.

On the shaft A is a cylindrical drum, T, which is mounted upon the shaft so as to turn loosely thereon. On its periphery are two cam-leaves, 25 25, which are arranged upon the periphery of the drum and in reference to each other, as shown in Fig. 2. On one end of the drum is a clutch, 26, which engages with the clutch 27 on the wheel S, so as thereby to cause the drum T to be revolved by the wheel S, and as the drum revolves the cam-leaves 25 25 are carried round against the pin 28, which projects from the shipper-bar M, and the shipper-bar is thus moved in either direction laterally to bring the pin 28 to the center of the drum, as in Fig. 2. In this position the driving-belts *a* and *b* should stand on their respective loose pulleys *d* and *f*. The drum will have now revolved sufficiently to bring the cam-cheek 29 against the lever N, whereupon the bar is pushed outward, so as to disengage the clutch 27 and allow the drum T to stop. The drum T fetches up with the boss 30, that projects from the drum, bearing down against the pin 28 on shipper-bar M, as shown in Fig. 2. The drum is thus prevented from being further revolved till the shipper-bar is moved laterally for the purpose of again starting the elevator.

At the end of the drum T is a leaf-spring, 31, one end of which is secured to the frame-work H, and the opposite end bears upward against a semi-cylindrical cam, 32, which said cam 32 is secured to the end of the drum T in such position that the spring 31 bears against one corner thereof, as in Fig. 4, while the boss 30 is on the pin 28 of the shipper-bar M. From this it must be evident that when the shipper-bar is moved laterally sufficiently to slide the pin 28 away from the boss 30 the spring 31 operates against the cam 32, so as to partially turn the drum T, and thereby bring the boss 30 down past the pin 28, and also carry the cam-cheek 29 past the lever N.

The brake device for stopping the elevator

may be seen best by reference to Fig. 7 of the drawings, which shows a cross-section thereof made on dotted line *x x*, Fig. 2. The standard 34 is mounted upon the frame H, and, projecting upward, operates as a support for the curved arms 35 and 36, which have their rear ends jointed to said standard 34 and their opposite ends jointed to the toggle-arms 37 37, which said toggle-arms are jointed to the shipper-bar M. The toggle-arms are of sufficient length to cause the brake-shoes 38 to bear against the wheel 39 while the toggle-arms remain on a center line; but a movement of the shipper-bar M in either direction for the purpose of starting the elevator carries the toggle-arms out of line, thereby releasing the pulley 39 and permitting the shaft A to revolve. The arm 35 drops away from the pulley 39 by its own weight merely; but the arm 36 must be lifted upward off the pulley 39, which is done by means of the leaf-spring 40, one end of which is secured to the frame H, and the opposite end of which presses upward against the end of the arm, as shown.

The operation of my improved elevator is as follows: By reference to Fig. 1 of the drawings we observe that the pointer 13 registers with Fig. 4 on the index-plate. This certifies that the elevator (if not in motion toward) must be resting at the fourth story in the building, and by reference to Fig. 2 we observe that the pin 30 on drum T presses down against the pin 28 on the shipper-bar M, while the cam-cheek 29 on the side of the drum T holds back the lever N, and thereby prevents the clutch-wheel S from coming into engagement with the clutch on said drum T, and likewise prevents the clutch on wheel O from entering the notch 41 in the drum 10. We also observe that the ratchet 19 is lifted out of contact with the drum, thereby leaving the same free to turn on the shaft P, as before described. We now assume that the operator desires to send the elevator-car to some other—say, for example, the seventh—story in the building. He has only to place one hand on the handle of the pointer 13 and move it upward till the pointer 13 registers with number 7 on the index-plate. This movement of the pointer is transmitted through the cord 11 to the drum 10, and partially revolves the same, thereby carrying the notch 41 away from the clutch-tooth 42. This movement of the drum 10 brings one of the cam-leaves 15 against the pin 16 on shipper-bar M, and moves the bar sidewise to shift the driving-belts *a* and *b*, thus setting the elevator in motion. This lateral movement of the bar M carries the pin 28 away from the pin or boss 30 on drum T, whereupon the spring 31, Fig. 4, operates to partially revolve the said drum, thereby carrying the boss 30 down past the pin 28, and also carrying the cam-cheek 29 away from the lever N. Thereupon the spring 7 operates to push forward the wheel O till arrested by the clutch-tooth 42 coming in contact with the end of drum 10, and in this man-

ner the clutch S is still prevented from engaging with the drum T; but the movement of the shaft F, in order to wind or unwind the drum E for the purpose of raising or lowering the elevator-car, turns the shaft P, as before set forth, and with it the clutch O, and when the clutch-tooth 42 gets round to the notch 41 in the drum 10 it is pushed into the notch by the spring 7, and thereupon the clutch S engages with the drum T and revolves it so as to bring the cam-leaves 25 and 25 round against the pin 28 on shipper-bar M, and so moves the bar M to reship the belts *a* and *b* onto their respective loose pulleys *d* and *f*; thereupon the cam-cheek 29 again strikes the lever N and pushes the same back to disengage the wheels S and O from their respective drums and permit the elevator to stop. The drum T is prevented from being carried round too far by reason of the pin or boss 30 on the drum coming in contact with the pin 28 on shipper-bar M. It will be observed that as the shipper-bar is brought back to its starting-point it applies the brake-shoes 38 38 to stop the elevator, and also lifts, by means of cam-cheek 24, the ratchet-tooth 18 out of engagement with the drum 10, leaving it free to be again adjusted or turned to again start the elevator.

It will now be understood that in order to have the elevator stop at a given story it is necessary to have the drum 10 arranged so that when the elevator reaches the given story the tooth 42 may be allowed to enter the notch 41. Hence in starting the elevator the drum 10 is revolved by moving the pointer 13 till the notch 41 is in position to register with the tooth 42, when the elevator-car reaches the given story; and when the shipper-bar slides forward or backward to start the elevator, it removes the boss or cam-cheek 24 from under the offset 23, thereby releasing the ratchet 19, and thus permitting the ratchet-tooth 18 to enter some one of the notches 17 in the drum 10. Said drum 10 is thereby prevented from being moved till released by lifting the ratchet-tooth 18 out of the said notch, which is done automatically by the cam-cheek 24 operating against the offset 23 as the elevator stops. When the pointer 13 registers with a number on the index-plate 14 the drum 10 must be in position so that the notch 41 will register with the clutch-tooth 42 as the elevator-car arrives at the given story. Hence in order to start the elevator and have it stop at a given story the operator has only to move the pointer 13 into line with the number on the index-plate that corresponds with the number of the given story.

What I claim is—

1. In an elevator and in combination, the following elements, namely: driving mechanism for raising or lowering the elevator-car, a belt-shifting bar, a drum operated by cords in connection with a pointer, and intermediate mechanism, substantially as described, whereby the belt-shifting bar is operated and the car started,

and also mechanism, substantially as described, whereby the car is stopped at its destination, all as set forth.

2. In an elevator, the combination, with the described belt-shifting device, of the rotatively-movable drum T, provided with cam-leaves 25 25, adapted to engage with a pin upon the bar M and automatically shift the belts, substantially as set forth.

3. In an elevator, the cylindrical drum T, having cam-leaves 25 25, combined with the described belt-shifting device and mechanism whereby the drum is rotated automatically in one direction, substantially as described.

4. In an elevator, the movable drum T, provided with cam-cheek 29, combined with the pivoted lever N and revolving clutch-wheels S and O, substantially as described.

5. In an elevator, in combination, the clutch-wheel S and mechanism for revolving the same, the movable drum T, provided with clutch 26 and cam-cheek 29, the pivoted lever N, the clutch-wheel O, and spiral spring 7, all combined and arranged to co-operate substantially as set forth.

6. In an elevator, the drum 10, with one or more cam-leaves arranged upon the periphery thereof, substantially as shown, combined with the described belt-shifting device, and mechanism whereby the drum may be acted upon from any story in the building and revolved so as to bring the cam-leaves on the drum into engagement with the belt-shifting device and operate the same to start or change the direction of the elevator-car, substantially as described.

7. In an elevator, the combination, with a shifting device for starting or changing the direction of the elevator-car, of a mechanism wherewith the said shifting device may be interlocked to prevent the said car from being stopped or changed till it shall have reached its destination, substantially as described.

8. In an elevator, the above-described shipping device, consisting of the horizontally-mov-

able bar M, the revoluble drum 10, the intermediate pin, 16, and cam-leaves 15, and the mechanism whereby the drum may be revolved, as set forth, combined with the ratchet 19, having tooth 18, and weighted angular arm 21, said drum and ratchet being arranged so that the tooth in the ratchet may automatically enter a notch in the drum, and thereby lock the same, to prevent its being again revolved till released by the removal of the ratchet, substantially as described.

9. In an elevator, the clutch-wheel S and mechanism for revolving the same, the movable drum T, provided with clutch 26, cam-cheek 29, and cam-leaves 25 25, the pivoted lever N, the revolving wheel O, having tooth 42, and arranged to permit of horizontal movement on its driving-shaft P, and the spiral spring 7, combined with the described belt-shifting lever M and the drum 10, substantially as described.

10. The combination of the driving-shaft A, the pulley 39, fixed thereon, the pivoted arms 35 and 36, and their intermediate brake-shoes, 38, with the belt-shifting lever M and the intermediate toggle-arms, 37 37, said toggle and pivoted arms being arranged in reference to the pulley 39 and in reference to each other, so as to permit the toggle-arms being carried with the shipper-bar in either direction and apply the brakes while passing the center line, substantially as described.

11. In an elevator, the combination of the cylindrical drum T, the leaf-spring 31, and the intermediate cam, 32, secured to the end of the drum and co-operating with said spring to effect a partial revolution of the drum, substantially as set forth.

In testimony whereof I have signed this specification.

GEO. R. PEARE.

In presence of—

C. B. TUTTLE,
J. W. CARVER.