(No Model.)

2 Sheets—Sheet 1.

W. A. KONEMAN.

ELEVATOR.

No. 319,099.

Patented June 2, 1885.

Fig 1.

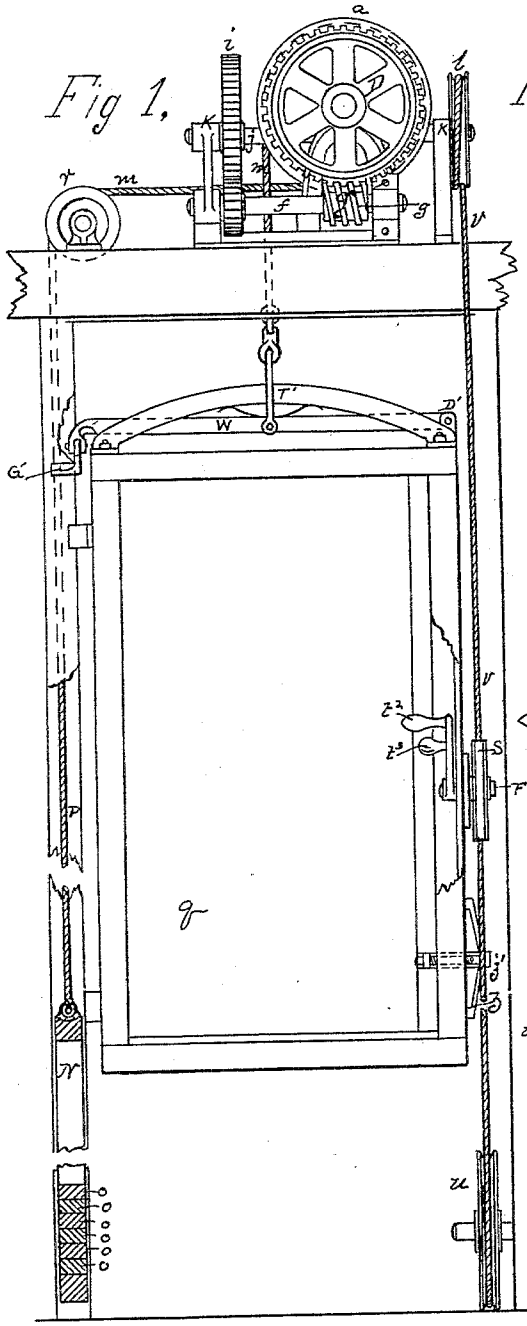
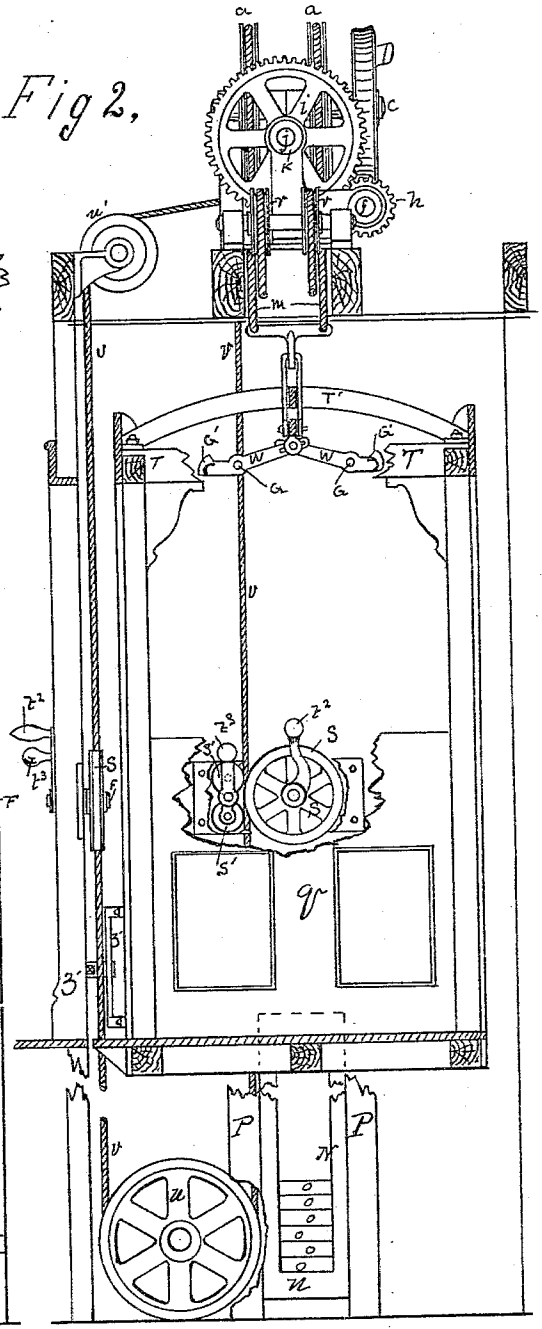


Fig 2.



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(No Model.) 2 Sheets—Sheet 2.

W. A. KONEMAN.

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Fig 3.

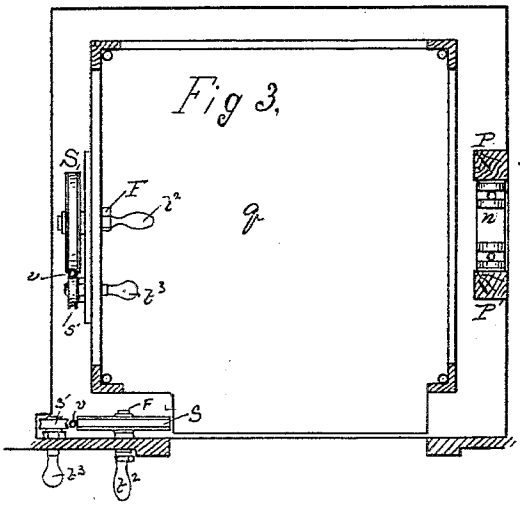


Fig 4.

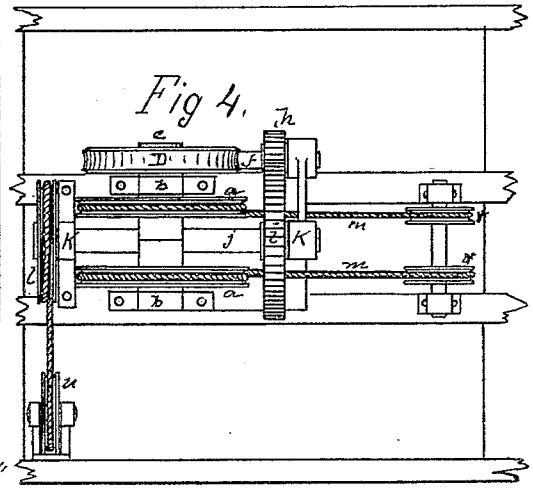


Fig 5.

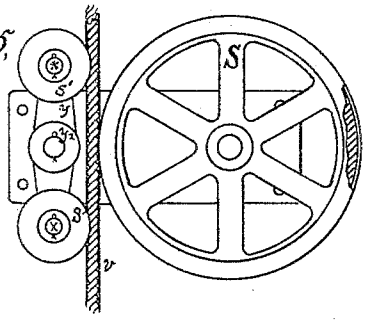


Fig 6.

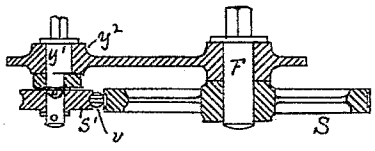
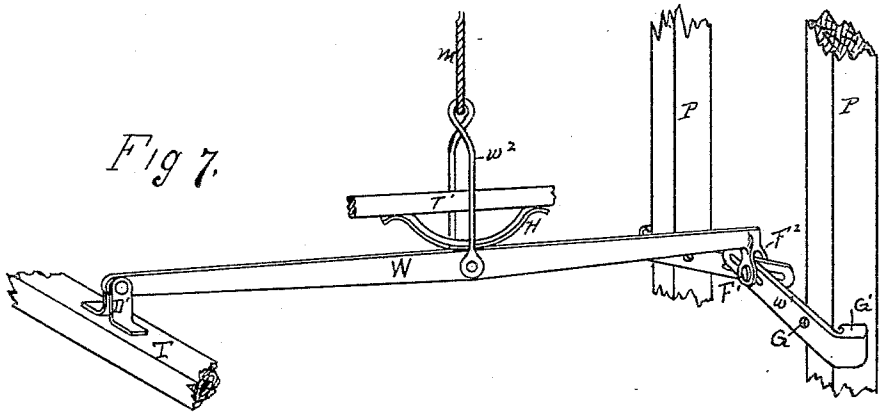


Fig 7.



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UNITED STATES PATENT OFFICE.

WILLIAM A. KONEMAN, OF CHICAGO, ILLINOIS.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 319,099, dated June 2, 1885.

Application filed October 27, 1884. (No model.)

To all whom it may concern:

Be it known that I, WM. A. KONEMAN, of Chicago, in Cook county, in the State of Illinois, have invented new and useful Improvements in Hand-Elevators and Dumb-Waiters; and I do hereby declare that the following is a full and accurate description of the same.

In hand-operated elevators or dumb-waiters of that class which are capable of carrying persons and heavy weights from story to story, it is desirable that the elevator mechanism shall be automatic as nearly as possible and capable of being used and operated from within the cab or from either floor, as may be most convenient, and without requiring more exertion of power than persons of ordinary strength are capable of exerting. It is also desirable that the motion imparted shall be steady and non-jerking, and that it shall be impossible for the cab to drop, if for any reason the hand is removed from the crank or other controlling mechanism. It is also desirable to conceal and protect the operative parts attached to the cab to prevent interference with or derangement of said mechanism, either accidentally or designedly. And for these purposes, first, an endless power rope or chain passing over pulleys or sprocket-wheels at top and bottom of the well is employed, with one part arranged within the well and through or adjacent to the cab, and the other part exterior to the cab, but adjacent to or accessible from the floors crossed by the elevator-cab, so that said rope can be operated from within the cab or from the floor of either story crossed by the elevator, as may be preferred. The power-rope operates the lifting mechanism, which is located at the top of the well, and therefore the cab may be caused to ascend or descend by a person within it, or by a person standing on either floor crossed by it. Second, the drum which supports the lifting-rope is provided with a worm-wheel, which meshes with a corresponding worm, and said worm is actuated by the endless power-rope, so that the worm imparts positively a motion to the drum to raise or lower the cab, and acts as a positive brake upon said worm-gear when the cab is descending. Third, the power rope or chain is caused to pass suitable clutch pulleys or sprockets provided with operative cranks within the cab, and also at such suitable stationary points on the floors as may be desired.

I am aware that power-ropes of elevators have heretofore been arranged so that they might be operated by a person standing upon either floor crossed by the elevator. Said power-rope being endless, and hanging freely suspended from a large pulley on the windlass at the top of the elevator-well, the elevator would be raised by pulling downward on one side and lowered by pulling downward on the other side. I am also aware that a counterbalance-elevator has been constructed so arranged that a person in the cab may ascend or descend by turning a crank, which crank operates a pinion, and which pinion travels upward or downward on a suitable rack-bar fastened to the elevator-well; but this application of power is combined with a manual foot-brake, and cannot be operated without releasing said foot-brake. Neither can it be operated except by a person in the cab, so that it is not under control from any floor-landing. My invention differs from both of these, because the endless power-rope, being passed over a pulley at top and bottom of the elevator-well, may, by the application of suitable clutching-pulleys, cause the elevator to ascend or descend with either strand of said endless rope by turning the cranks connected with said clutch-pulleys to the right or to the left, thus pulling the rope up or down.

The following particular description of the structure of my invention as I prefer to make it has reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the elevator well, cab, and mechanism. Fig. 2 is a front view of the same, with a part of the cab broken away to exhibit the clutch-pulley mechanism, adjustment of power-rope, and hall attachments. Fig. 3 represents a cross-section through the cab, elevator well, cab and landing clutch-pulleys, and counter-weight. Fig. 4 represents a cross-section through worm-gear mechanism. Fig. 5 represents clutch-pulleys, front view. Fig. 6 represents a sectional view through clutch-pulleys. Fig. 7. represents arrangement of automatic safety-brake on top of cab.

P′ P″ are upright guides erected within the

well and secured to the walls thereof for the guidance of the cab *q*. At the top of the cab, mounted and secured firmly, arm W W is attached, and a proper number of lifting-ropes, *m m*, extend therefrom over the drum-pulleys *a a* at the top of the well, and thence over guide-pulleys *r r* downward to the counter-weight *n*, which is most conveniently made with loose weights *o o*, whereby the counter-weight may be increased or diminished, as occasion requires. The lift-ropes *n n* may pass around the drum-pulleys *a a* more than once, to secure sufficient traction; but I prefer to limit the terms to one, and thereby avoid any possibility of one part riding on another. I therefore lead the lift-rope up to the drum and around the same once, and then off horizontally, or nearly so, to a guide-pulley, *r*, at the side of the well, and thence down to the counter-weight, as shown in Fig. 2.

The shaft *c* of the drum-pulleys *a a* rests in bearings *b b*, and is provided with worm-geared wheel D, which meshes with a worm, *g*, on the shaft *f*. A revolution of this worm causes the drum-pulleys to revolve and the cab to move, and restrains it from moving on all times except when power is applied designedly to cause said worm to revolve. The shaft *f* is also provided with a pinion, *h*, which meshes with the gear-wheel *i* on a shaft, *j*, which is supported in bearings *k*. The shaft *j* is also provided with a pulley or sprocket wheel, *l*, over which the power rope or chain *v* is placed. Said power rope or chain, preferably the former, is endless, and extends from the pulley or sprocket wheel *l* down to the bottom of the well and under a corresponding movable pulley or sprocket, *u*, thence upward to the top of the well over a suitable guide pulley or sprocket, *u'*, meeting at and passing over pulley *l*. One part of the power rope or chain *v* passes through or adjacent to the wall of the cab *q*, and the other part passes through or adjacent to the floors crossed by the elevator, and as said rope or chain is endless and fixed in position by the pulleys *l* and *u*, it is apparent that the worm *g* may be rotated by pulling either up or down on said rope or chain at any point where it may be accessible. The wheels *h* and *i* are different in size and diameter, so as to multiply on shaft *f* the motion imparted to shaft *j*, and thereby cause the cab *q* to move at the rate desired.

As it is not convenient nor desirable to apply the motive force by pulley directly either up or down on the rope or chain *v*, I apply a crank-movement by attaching at a convenient height from the floor a suitable bearing for a short shaft, F, on one end of which is a crank, t^2, and on the other end a pulley or sprocket wheel, S, which engages with the power-rope, as shown in Figs. 5 and 6, and lifting-power is communicated to pulley S by guide-pulleys S' S', which guide-pulleys rotate on axles *x x*, said axles *x x* being fastened to arm *y*. Said arm *y* is thrown toward pulley S, thus forcing the rope *v* in contact with pulley S, or it is thrown away from pulley S, thus relieving contact, by means of crank T^3, which rotates eccentric pin *y'* in bearing y^2. I do not confine myself to this particular construction, as a suitable clutch pulley or sprocket answers the purpose equally as well, the main point being that the rope *v* may be relieved of contact and consequent friction at all points except the place where it is desired to operate or move the cab. One of these power-applying wheels S, in combination with pulleys S' S' is placed on outside of the cab and one on each floor-landing, or on as many landings as may be desired, so as to make it possible to operate or move said cab from any point where such power appliance is placed.

Crank-handles t^2 and eccentric handles t^3 are in all cases placed on the inside of the cab and on the outside of the elevator-well at the landings.

No ratchets or other holding devices are required, because the worm *g*, which is rotated by power-rope *v*, constitutes a positive brake.

In order to assure safety to a passenger in the cab in case the carrier-ropes should break or the movement give way, I apply a safety-brake on top of the cab, as shown in Fig. 7. This operates as follows: T is a cab-timber at the roof of cab T', iron or wooden carriers reaching across the top of cab; W, an arm pivoted on one end to bearing D, and carrying, by means of lugs F and pin F', arms *w'*, which arms *w'* are fastened to timbers T by means of bolts G in such manner that arms *w'* form a toggle-joint. Said arms *w'* are extended beyond bolt G, so that they pass guide-posts P, and the ends of said bars *w'* are turned to a right angle in such a manner that when said toggle-joint is straightened or brought in a straight line the turned portions of G (being marked G') will engage with and clutch the outer side of guide-posts P P. H is a spring, which is fastened to arm W on one side and rests against cab-carrier T'. w^2 is a hang-iron or carrier, which is fastened to the center of arm W at one end, and to which are fastened the carrier rope or ropes *m*. It will be seen that the entire load of cab and passenger is thus carried on brake-arm W. This causes spring H to be compressed between cab-carrier T' and brake-arm W, and also causes toggle-joint bars *w'* to be raised and clutch G' to be released from guide-posts P. If, now, carrier ropes or rope *m* break or slacken, thus taking the strain off carrier-bar W, then spring H will expand and force carrier or brake arm downward, which in turn will cause toggle-joint bars *w'* to straighten and clutches G' to engage with guide-posts P, and thus to act as an automatic brake on cab *g*, holding it suspended and keeping it from descending.

Having described my invention, I claim—

1. In combination with the cab of an elevator, an endless power rope or chain passing over pulleys or sprocket-wheels at both top and bottom of the elevator-well, and arranged to be operated by power applied to one part

of said rope from within the cab, by power applied to the other part of said rope from position on the floor or floors, as set forth.

2. In combination with the cab of an elevator, an endless power-chain passing over pulleys or sprockets at both top and bottom of the elevator-well, said chain at one side of said pulley being passed through or adjacent to the cab, and the part on the other side being arranged through or adjacent to the several floors crossed by the elevator, so that the cab may be caused to move by power applied to said chain or rope at any accessible point.

3. In combination with an elevator-cab, its lift-rope and drum, a skew-toothed or worm wheel meshing with a worm which is controlled and operated by a power rope or chain which passes over sprockets or pulleys at top and bottom of the elevator-well, whereby the drum and cab are forced to move when power is applied to revolve said worm, and restrained from revolving by said worm at all other times.

4. In combination with the cab of an elevator and an endless power chain or rope passing over sprockets at top and bottom of the elevator-well, and arranged on one side to pass said cab, and on the other to pass through or adjacent to the floors crossed by the elevator, and sprocket or pulley power-wheels in engagement with said power chain or rope, said power-wheels being provided with operative cranks severally accessible from the cab and from the floor, substantially as set forth.

5. The combination, with an elevator-cab and a power rope or chain which passes over sprockets or pulleys at both top and bottom of the elevator-well, of sprocket-wheels S, provided with operative cranks t^2, and leading-wheels S′ S′, whereby the power-chain is maintained in proper engagement with said sprocket, as set forth.

6. The cab q, with its lifting-rope m, drum a, and counter-weight n, combined with the skew-toothed wheel D, attached to the shaft of the drum a, the worm g, pinion h on said worm-shaft, the wheel i, in mesh with said pinion, and the power-chain v, accessible alike from the cab q and from the floors crossed by the cab, as and for the purpose set forth.

7. The power-rope of an elevator, combined with a crank-pulley, S, movable pinching-pulleys S′ S′, and a cramping-lever, whereby they may be moved to pinch or liberate the power-rope, as and for the purpose set forth.

8. The power rope or chain v, combined with the crank-pulley S, the pinching-pulleys S′ S′, mounted on a movable bar, y, and the eccentric center pin, y', whereby said bar and pinching-wheels may be moved toward or away from the crank-wheel S.

9. The cab of an elevator and an endless power rope or chain arranged to pass over pulleys or sprockets at both top and bottom of the elevator-well, with one part of said rope or chain passing through or adjacent to the cab, and the other part passing through or adjacent to the several floors crossed by the cab, combined with crank-pulleys arranged at the several stations from which said elevator may be operated, as set forth, and pinching-pulleys arranged to clamp said rope or chain at will against their crank-pulley, whereby said power-rope may be out of engagement with all the pulleys except the one whereby it is being operated, as set forth.

10. The cab of an elevator and its lift-rope, combined with the brake-bar W, pivoted at one end to the cab and at the other end connected with the toggle brake-levers w' w', and the spring H, whereby if the lift shall break said toggle brake-arms will be immediately caused to engage the elevator-guides with a grip proportionate to the weight of the cab and load.

WM. A. KONEMAN.

Witnesses:
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F. M. MELICK.