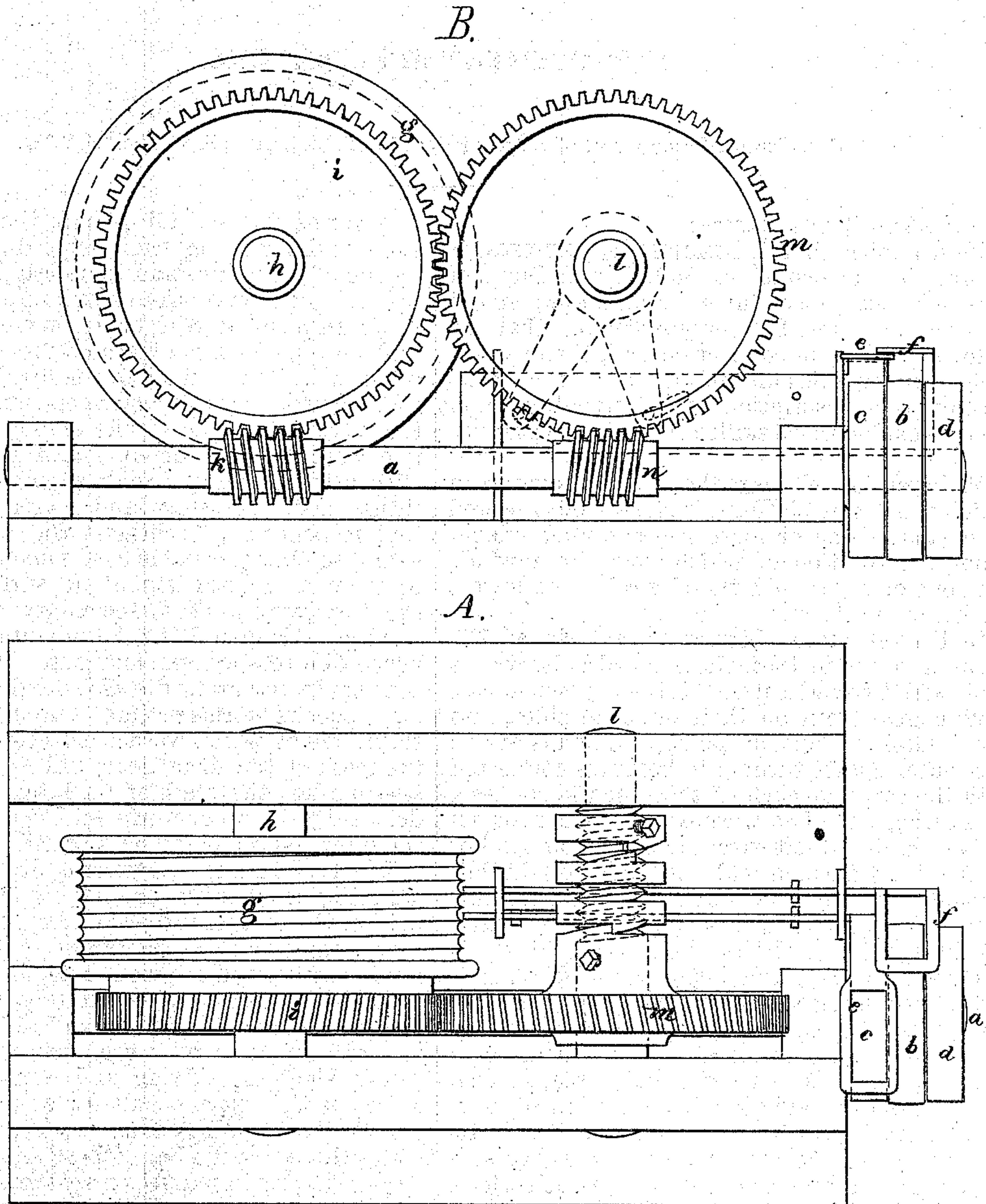


[63.]

F. B. PERKINS.
Improvement in Elevators.

No. 119,401.

Patented Sep. 26, 1871.



Witnesses.
J. B. Kiddley
M. W. Frothingham.

F. B. Perkins
by his Atty's
Crosby & Gould

UNITED STATES PATENT OFFICE.

FRANCIS B. PERKINS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF
AND CAMPBELL, WHITTIER & CO., OF SAME PLACE.

IMPROVEMENT IN ELEVATORS.

Specification forming part of Letters Patent No. 119,401, dated September 26, 1871.

To all whom it may concern:

Be it known that I, FRANCIS B. PERKINS, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Elevators; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to that class of elevators in which the car or platform is raised and lowered by means of one or more ropes wound upon a drum, the rotation of which winds or unwinds the rope or ropes, and thereby raises or lowers the car or platform.

In United States Letters Patent No. 42,595, granted to me in 1864, the vertical hoist-way is made with two vertical and stationary gear-racks, having gear-teeth on their opposite sides, into which mesh pinions on the opposite ends of two horizontal shafts turning in bearings connected with the car, and each of these shafts carries a worm-wheel, the two worm-wheels being driven by two right-and-left worms or screws on another shaft, (also connected with the carriage,) this latter shaft carrying a shieve or pulley, around which a band or rope extends from a pulley on the driving-shaft, the two shafts of the gears which directly affect the hoisting being actuated by right-and-left worms on a cross-shaft. This is also true of my present invention, two right-and-left worms on one shaft being employed to actuate the gears which directly effect the rise and descent of the car, the shafts of said gears being journaled, however, in stationary bearings, instead of in bearings affixed to the car, and the car being suspended from a rope or suspensory, which winds upon a suitable drum actuated by the right-and-left-hand worms on the driving-shaft. These right-and-left-hand worms have been of late employed in an elevator to work two rope-winding drums, each drum-shaft having a worm-gear or worm-driven gear; but such an organization requires a system of duplicate ropes, the drums occupy too much room, and the whole arrangement is expensive, and the advantages obtained do not compensate for the expense and the extra room taken.

In my invention I employ but one winding-drum; but to actuate said drum I employ the

two worms on the driving-shaft, the gear on the shaft of the winding-drum being directly driven by one of the worms and indirectly by the other, through the intervention of an intermediate gear, said intermediate gear being on a counter-shaft and meshing into the teeth of the worm at one point and into the teeth of the drum-gear at another point. By this arrangement I obtain all the advantages due to the employment of the two worms on the driving-shaft, in connection with a winding-drum, such as preventing end-thrust upon the shaft and increasing the extent of bearing or contact-surface between the gears, so that the strain comes upon more points or upon a greater extent of surface without the employment of a secondary or duplicate winding-drum and the disadvantages and expense due to such employment. My invention consists in actuating the winding-drum shaft by two opposite worms or screws upon the driving-shaft, one of which worms meshes directly into the teeth of the drum-gear, while into this gear also meshes the teeth of an intermediate gear driven by the other worm on the driving-shaft, the intermediate being on a counter-shaft.

The drawing shows a winding-drum and drum-actuating mechanism embodying my invention, neither the car, nor the suspensory, nor the hoist-way being shown, as they form no direct part of my invention and are well understood.

A and B represent, respectively, the mechanism in plan and in side elevation, the journal-stands being removed in the latter figure to more clearly show the driving and worm-gear shaft. *a* denotes the driving-shaft, *b* the fast pulley, and *c d* the loose pulleys thereon; *e f*, the forks or slides that shift the belts, these slides being automatically operated to arrest the movement of the car and to reverse its movement by mechanism not necessary herein to explain. *g* denotes the rope or suspensory winding-drum fixed upon a shaft, *h*, which is journaled and rotates in suitable stationary bearings or boxes. On this shaft is the gear-wheel *i*, the teeth of which are inclined, said teeth meshing into and being driven by a worm or screw, *k*, on the driving-shaft *a*. *l* denotes a counter-shaft carrying a gear, *m*, similar to the gear *i*, the teeth of which gear mesh into and are driven by another worm or screw, *n*, on the driving-shaft *a*, the two screws *k n* being respectively right-and-left screws and imparting

rotative motion in opposite directions to the two gears *i m*. The teeth of the gear *m* also engage with the teeth of the main or drum-gear *i*, the gear *m* being thus made an intermediate between the driving-shaft and the drum-gear, thereby assisting in driving the drum, increasing the extent of contact-surface of the driving mechanism, lessening the strain upon the direct driving mechanism, (the worm *k* and worm-gear *i*,) and freeing the driving-shaft from end-thrust.

I claim—

In combination with the drum *g* and its gear *i*, operated by the worm *k* on the driving-shaft, the intermediate gear *m*, driven by the worm *n* on the driving-shaft, and engaging with and actuating the drum-gear *i*, substantially as shown and described.

Executed August 4, A. D. 1871.

F. B. PERKINS.

Witnesses:

FRANCIS GOULD,
S. B. KIDDER.

(63)