(No Model.) 2 Sheets—Sheet 1.

# D. D. WALTON.

## ELEVATOR HOIST.

No. 545,028. Patented Aug. 20, 1895.

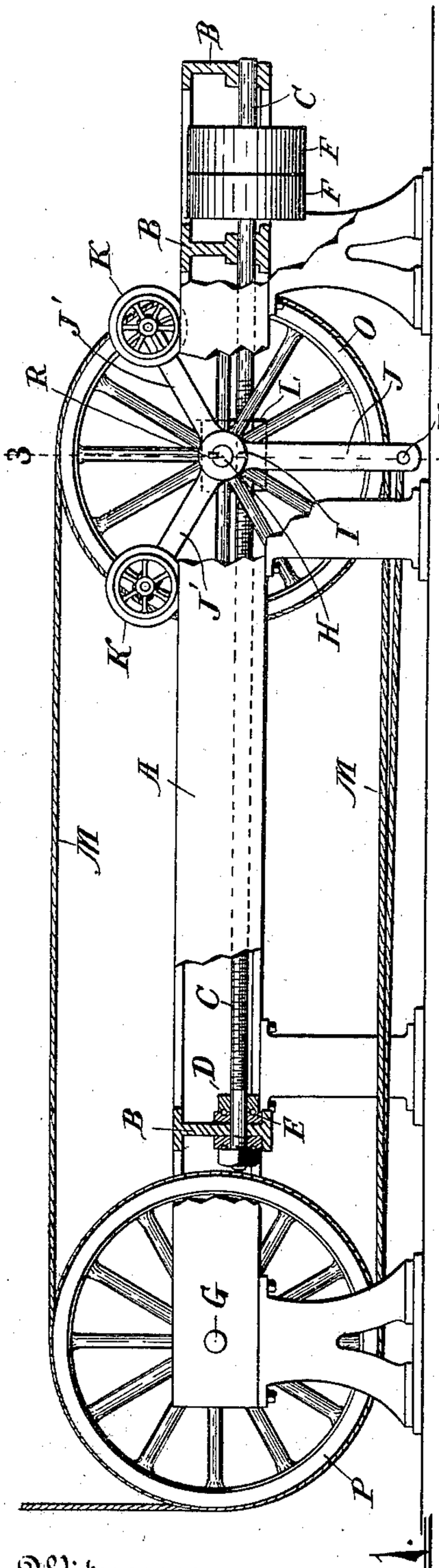


Fig. 1.

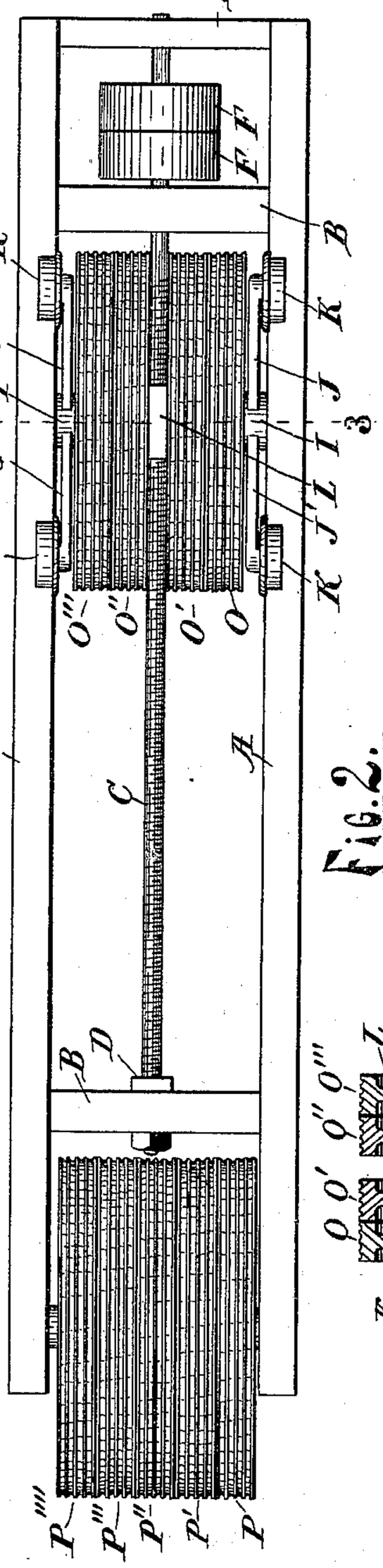


Fig. 2.

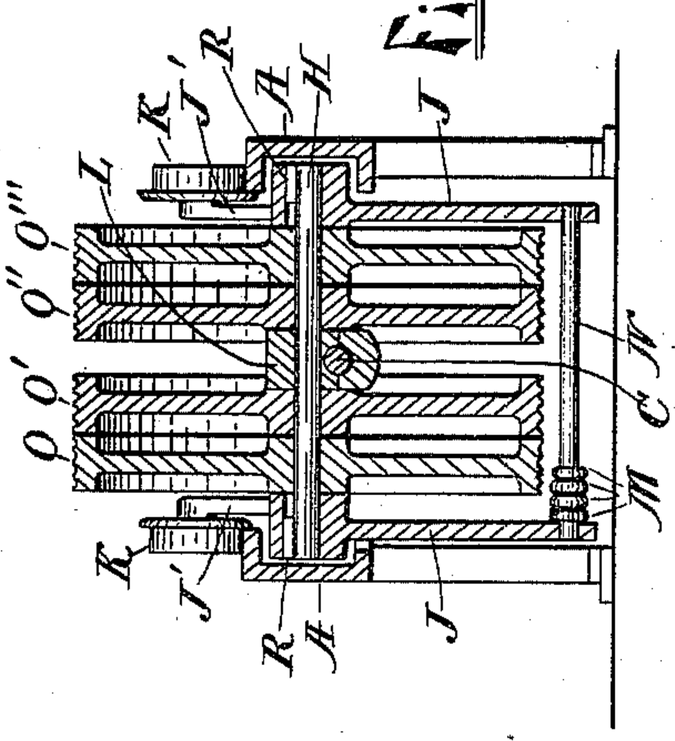


Fig. 3.

Witnesses
Lewis E. Flanders.
Lois Moulton

Inventor
Dayton D. Walton

By Attorney
Luther V. Moulton

(No Model.) 2 Sheets—Sheet 2.

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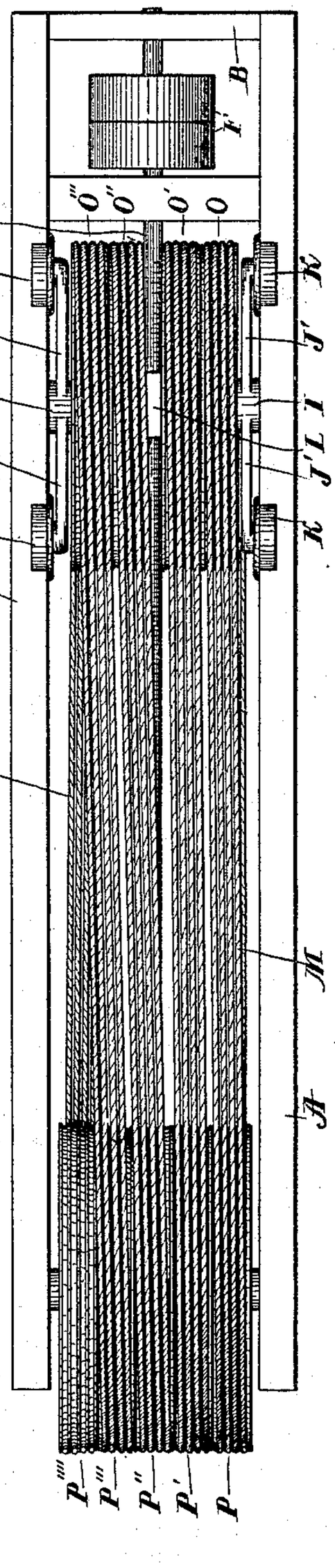


Fig. 1.

Witnesses
Lewis E. Flanders.
Lois Moulton.

Inventor
Dayton D. Walton.
By Attorney
Luther V. Moulton

# UNITED STATES PATENT OFFICE.

DAYTON D. WALTON, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO JOHN B. HALL, OF SAME PLACE.

## ELEVATOR-HOIST.

SPECIFICATION forming part of Letters Patent No. 545,028, dated August 20, 1895.

Application filed January 5, 1895. Serial No. 533,990. (No model.)

*To all whom it may concern:*

Be it known that I, DAYTON D. WALTON, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Elevator-Hoists; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in elevator-hoists; and its object is to provide the same with certain new and useful features hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying my invention, with parts broken away to show the construction; Fig. 2, a plan view of the same with the cable omitted; Fig. 3, a transverse vertical section on the line 3 3 of Figs. 1 and 2, and Fig. 4 a plan view of the same as Fig. 2 with the cable in place.

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

The frame consists of two parallel angle-iron sills A A, connected at suitable intervals by cross-beams B, in which beams is journaled a screw C, arranged parallel to said sills and midway between the same. Said screw is provided with a suitable collar D and ball-bearing E to take the end-thrust of said screw, which collar and bearing may be located at any convenient beam B.

F F represent pulleys or any other suitable means to rotate said screw.

G is a fixed transverse shaft upon which are journaled a series of sheaves P P′ P″ P‴ P⁗ to engage the cable M, said sheaves being independently rotative on said shaft and arranged in continuous series.

H is a laterally-movable shaft supported at each end by a suitable carriage consisting of Y-shaped frames, each frame having a boss I, to which said shaft is secured by a key R, and also a pendent vertical arm J and oppositely-extended inclined arms J′ J′, on which arms are journaled flanged wheels K K, engaging and traversing the parallel sills A, which sills thus serve as tracks for said carriage. The arms J J at their lower ends are connected by a transverse bar N, which passes below a series of grooved sheaves O O′ O″ O‴, independently journaled on the shaft H. The screw C passes between the sheaves O′ and O″, leaving an equal number of sheaves at each side of the screw and a gap between the sheaves only sufficient to permit the screw to pass through. Said screw passes below the shaft H and a suitable distance from the same, and said screw and shaft are connected by a nut or block L, having a transverse opening in which the shaft H is fixed and a longitudinal screw-threaded opening engaged by the screw C. The hoisting-cable M is attached at one end to the bar N, passing thence around the first sheave P of the fixed series and thence around the first sheave O of the movable series and thence successively around all the remaining sheaves in both series and finally extending beneath the sheave P⁗ and thence upward to the top of the elevator-shaft, as usual. It will be observed that the fixed series of sheaves P, &c., are close to each other and the middle one of the series is substantially opposite the end of the screw; also, that the gap in the movable series of sheaves is barely sufficient to let the screw pass. I thus reduce the lateral lead of the cables in passing from the sheave O′ to the sheave P″ and thence to the sheave O″ to a minimum, and thus reduce wear and friction on the cable and flanges of the sheaves. Another feature is the arrangement of the screw below the horizontal plane of the shaft H and attachment of the end of the cable to the bar N, thus connecting its end with the arms J, and, further, the divergent arms J J and wheels K K. The strain of the parts of the cable M, engaging the sheaves O O′ O″ O‴, falls upon the shaft H and tends to turn the nut L and cause it to bind on the screw, and the strain of the end of the cable on the arms J J has an opposite tendency. The distance from the axis of the shaft to the axis of the screw being as much less than the distance from the axis of the screw to the axis of the bar N as the strain of the parts of the cable on the shaft H is greater than that of the end of the cable on the bar N the effect

is to exactly balance the strains on the screw as a fulcrum. I am thus enabled to use a straight plain shaft H, passing the screw in a different plane, thus materially cheapening the structure. Furthermore, by attaching the end of the cable to the moving carriage I am enabled to get the same hoist with one less sheave in the system and with less length of cable than when the cable is attached at the end to a fixed anchorage. By providing two flanged bearing-wheels K at each side, the tendency to rotation of the shaft H, due to friction of the sheaves O, is resisted and taken off the screw, and any unequal strains at each side of the screw fall on the flanges of the wheels K K instead of the screw. I thus effectually avoid any binding of the nut on the screw, which is quite common in the usual forms of analogous devices. To avoid accidents from a breaking cable, I provide each sheave with a series of grooves and use a corresponding number of cables side by side. In case one of said cables should break, the others would hold.

What I claim is—

1. In an elevator hoist, the combination with a fixed shaft and a movable shaft and a series of sheaves journaled on each shaft, of a screw arranged at right angles to the movable shaft and below the same, a nut connecting said screw and shaft, a rigid arm extending downward from said shaft and a cable attached at its end to said arm and engaging said sheaves, substantially as described.

2. In an elevator hoist, a series of stationary sheaves, a series of movable sheaves, a shaft on which said movable sheaves are journaled, a nut attached to said shaft, a screw engaging said nut below the horizontal plane of said shaft downwardly extended arms rigidly attached to said shaft, a transverse bar connecting said arms and a cable attached to said bar, and engaging said sheaves, substantially as described.

3. In an elevator hoist, in combination with the laterally movable shaft having the movable sheaves journaled thereon a nut downwardly projecting arms, and upwardly projecting arms, all rigidly attached to said shaft, a screw engaging said nut below the horizontal plane of said shaft, a bar connecting the downwardly projecting arms, a cable attached to said bar and engaging said sheaves, flanged wheels journaled on said upwardly projecting arms, and tracks traversed by said wheels, substantially as described.

4. In an elevator hoist, the arrangement and combination of a continuous series of stationary sheaves, a screw in line with the middle of said series and opposite the middle sheave of the series and a shaft moved by said screw, and a series of sheaves journaled on said shaft and equally divided at each side of said screw, and a hoisting cable engaging all of said sheaves, substantially as described.

5. In an elevator hoist, in combination with a series of stationary sheaves, and a series of movable sheaves a shaft on which said movable sheaves are journaled, a nut attached to said shaft, a screw engaging said nut below the horizontal plane of said shaft, downwardly projecting arms attached to said shaft, a cable attached at its end to said arms and engaging said sheaves, two upwardly projecting and diverging arms rigidly attached to each end of said shaft, flanged wheels journaled on said arms, and parallel tracks engaged and traversed by said flanged wheels, substantially as described.

6. An elevator hoist, consisting of parallel sills, transverse beams, a screw journaled in said beams, a thrust collar on said screw, ball bearings for said collar, a fixed shaft having a continuous series of sheaves, journaled thereon, a movable shaft having a series of sheaves journaled thereon, a nut on the middle of said shaft engaged below the horizontal plane of the shaft by said screw, divergent arms rigidly attached to said shaft, at each end, grooved wheels journaled on said arms and traversing said sills and means for rotating said screw, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DAYTON D. WALTON.

Witnesses:

LUTHER V. MOULTON,

JOHN B. HALL.