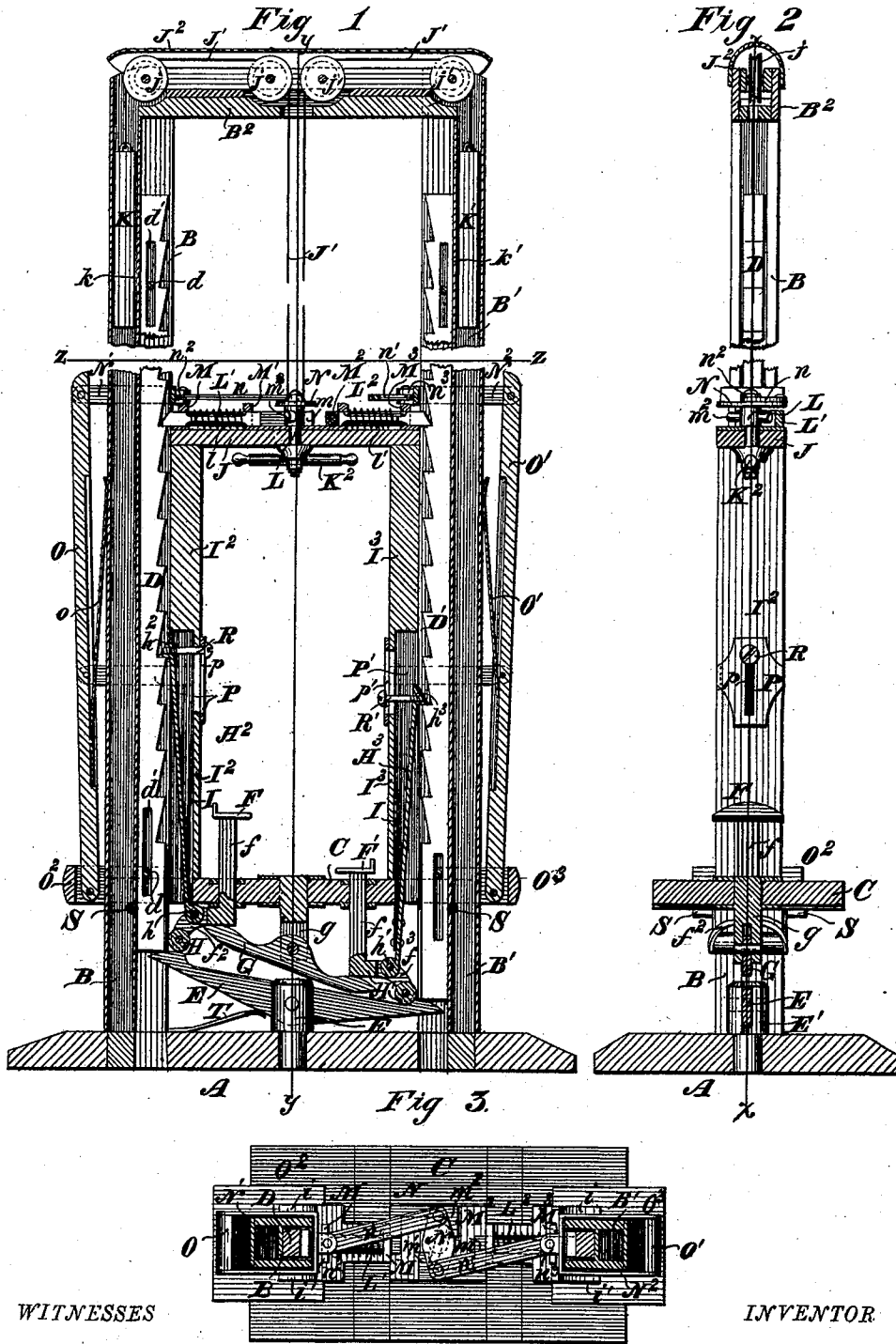


H. WOJAN.
ELEVATOR.

No. 173,150.

Patented Feb. 8, 1876.



WITNESSES
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HERRMANN WOJAN, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO HIMSELF AND ANTONI WLODEK, OF SAME PLACE.

IMPROVEMENT IN ELEVATORS.

Specification forming part of Letters Patent No. **173,150**, dated February 8, 1876; application filed January 20, 1876.

To all whom it may concern:

Be it known that I, HERRMANN WOJAN, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Elevators, of which the following is a specification:

My invention relates to an elevator of the class having a platform which moves up and down between supporting-guides or controlling-ways; and my main object is so to construct the elevator that its platform may be caused to ascend by the alternate action of reciprocating racks operated by reciprocating stands or treadles carried by the platform. The subject-matter claimed will hereinafter specifically be designated.

In the accompanying drawings, which show all my improvements as embodied in an elevator mounted upon a movable base, Figure 1 is a vertical central section, on the line $x x$ of Fig. 2; Fig. 2, a similar section at right angles to that shown in Fig. 1, and on the line $y y$ of said figure; and Fig. 3, a horizontal section, on the line $z z$ of Fig. 1.

Posts or upright frames $B B^1$ (shown in this instance as mounted or supported on a movable base, A , and connected at top by a cross-piece, B^2) serve as guides or controlling-ways for a platform, C , which moves up and down between them. The platform embraces the uprights at its ends, being suitably recessed or mortised for this purpose. The guide-posts or uprights are hollowed or slotted longitudinally to receive rack-bars $D D^1$, which are allowed a vertical reciprocating movement, and prevented from becoming accidentally displaced by pins $d d^1$, passing through the uprights and through slots d' in the toothed bars. These bars rest at their lower ends upon the opposite ends of a vertically-rocking arm or lever, E , centrally pivoted in a short post or support, E' , on the base A , where a base is provided, as herein shown, or upon a cross-piece extending between the lower ends of the uprights or controlling-ways, when the base is dispensed with. The platform is cut through on each side of its center, and provided with vertically reciprocating stands or treadles $F F^1$, operating, as they are alternately depressed, upon the opposite ends of a rocking arm or lever,

G , centrally pivoted in a post or down-hanger, g , secured to the bottom of the platform. The supports or rods $f f^1$ of the treadles or movable stands pass through the slots in the platform, and are formed or provided at their lower ends with outwardly-bent portions $f^2 f^3$, forming bearers, acting upon the rocking arm G . These bearers are forked and bent downward, and provided with rollers $H H^1$, which bear, as the treadles are reciprocated, upon the inner sides of the uprights or platform-controlling frame. Jointed arms or dogs $H^2 H^3$ project upward from the treadle-rods to act upon the rack-bars $D D^1$. These arms $H^2 H^3$ are shown as pivoted at their lower ends $h h^1$ between the forks of the treadle-bearers, and as provided at their upper ends with hooks or detents $h^2 h^3$, which engage with the teeth of the rack-bars. Springs $I I^1$, secured at their lower ends upon the insides of these pivoted arms, and bearing against the inner surfaces of casings or inclosing-frames $I^2 I^3$, press the hooks in toward the rack-bars. The flanged sides $i i^1$ of these frames $I^2 I^3$ move, as the platform ascends and descends, in close contact with the supporting-uprights, and steady as well as aid in guiding the movements of the platform.

A cross piece or brace, J , connects the platform-guiding and dog-incasing frames $I^2 I^3$, thus securely bracing the platform. Ropes or cords J^1 pass from the cross-brace of the platform over pulleys $j j^1 j'$, mounted in the top cross-piece B^2 of the elevator-frame, and extend downward into the hollow frame-uprights, having weights $K K^1$ attached to their ends. A cap or shield, J^2 , covers and protects the pulleys and top of the framing. These weights serve to counterbalance the platform and mechanism carried thereby, and move in ways or chambers in the uprights, separated from the racks by partitions $k k^1$. The cords are shown as connected with the platform by a turning shaft or bolt, L , mounted in the cross-piece of the platform, which bolt is provided with a lever, K^2 , beneath the cross-piece. Sliding clutches or detents $L^1 L^2$, for engaging with the rack-bars and sustaining the platform, reciprocate upon the cross-brace in suitable ways or guides $M M^1 M^2 M^3$, being, in

this instance, forced up to their work by coiled springs $l\ l'$, bearing at their inner ends upon the inner guideways $M\ M'$, in which the detents work, and at their outer ends against pins on the detent-bars just inside of the outer guides $M^2\ M^3$. The inner ends of the detent-arms are bent, and provided with shoulders or lugs $m\ m'$, on opposite sides of the turning-bolt L . A pin, m^2 , passing through the turning-bolt, so as to form studs on the opposite sides thereof, acts simultaneously upon the lugs $m\ m'$ when the lever K^2 is turned, withdrawing the detents from the rack-bars.

The turning-bolt L is connected with brake mechanism for checking the descent of the platform, in this instance by means of rods $n\ n'$, jointed at their inner ends to the opposite ends of a cross head or plate, N , centrally secured to the turning-bolt, and at their outer ends to lugs $n^2\ n^3$ on bows or yoke-like frames $N^1\ N^2$, embracing the uprights $B\ B'$ of the elevator-frame, and secured outside thereof to brake blocks or plates $O\ O'$, pivoted at their lower ends in supporting-brackets $O^2\ O^3$, secured to the platform in suitable manner at the sides of the uprights. Strong springs $o\ o'$, secured at their lower ends to the insides of the brake-blocks, and bearing at their upper ends (which should be slightly turned outward) upon the outside of the frame-uprights, press the blocks outward with a constant tendency to keep the brake mechanism inoperative. The brakes are brought into operation by the turning bolt or head L and lever K^2 .

Yokes or forked frames $P\ P'$, secured to the hinged brake-blocks by means of their forks, which embrace the guiding-uprights, move in and out with the brake-blocks. The frames are, by preference, provided with guideways in the sides of the frames $I^2\ I^3$, which connect the platform and cross-beam B^2 , to brace them and keep them in proper position as they are reciprocated by the movements of the brakes. Vertical slots $p\ p'$ in the frames $P\ P'$, and corresponding slots in the platform-guiding frames $I^2\ I^3$, receive and allow play to pins $R\ R'$ on the spring arms or dogs $H^2\ H^3$. These pins are headed or provided with stops on their outer ends, as shown, so that when the frames $P\ P'$ are moved inward they act on the pins and pull the dogs inward, disengaging them from the rack-bars.

It will thus be seen that, by the action of the turning-bolt, the brakes are brought into operation, the platform-sustaining clutches $L^1\ L^2$ disengaged from the rack-bars, and the dogs $H^2\ H^3$ withdrawn from the rack-bars simultaneously, or nearly so, with the turning of the lever K^2 .

The operation of the elevator is as follows: The platform being in the position represented in Fig. 1, the lowest point to which it is desirable it should descend, (in which position it may rest upon suitable stops $S\ S$ in the frame-uprights,) the person wishing to ascend steps upon the platform and places his foot upon the treadle or reciprocating stand F , which,

in this instance, is held in position to be operated by means of a spring, T , on the base bearing up the end of the base-lever E beneath the treadle F . The treadle, being depressed by the operator, who throws his weight upon it, rocks the platform-lever G , moving its end beneath the bearer f^2 of the treadle F downward. This movement of the lever throws up its end beneath the bearer f^3 , moving up the treadle-stand F' to its extreme upward position, corresponding to that occupied by the stand F when the operation commenced. As the treadle F descends the hook h^2 of the spring arm or dog H^2 , carried by the treadle, being engaged with one of the teeth of the rack-bar D , draws down the rack, the lower end of which always rests on the end of the base-lever E beneath it, the inclined edges of the teeth of the bar slipping by the spring-clutch L^1 . During the downward movement of bar D' the end of the lever E beneath the rack-bar D' throws up this rack-bar. Thus, as the rack D moves down the rack D' is carried up. As the treadle F' ascends by the lever E acting on it, and as the platform is automatically clutched with the rack-bar D' by means of the spring-detent L^2 , the platform is moved up one step, or half the length of a tooth of the rack-bar, the dog H^3 and its hook h^3 moving with the bar D' , and the spring-clutch L^1 freeing itself automatically from the rack-bar D during this movement. By the time the treadle has reached the limit of its downward movement and the treadle F' arrived at its uppermost position, the clutch L^1 again engages with the rack D , the operator bears on his other foot or transfers his weight to the treadle or reciprocating stand F' , and the above-described operation is inversely repeated, elevating the platform another step, or half the length of a notch of the rack-bars, and so on until the desired elevation of the platform is attained or the limit of its ascent reached. When the operator wishes to descend, the lever K^2 is turned, thus throwing the brake into operation, withdrawing the dogs from the rack-bars and disengaging the sliding clutches, as will plainly appear from the foregoing description by reference to the drawings. The brakes enable the operator to stop the platform at any desired place in its descent. The turning-lever K^2 should be arranged so as to be convenient to the operator, and may serve as a hold to steady him while upon the platform or using the treadles. Two persons can use the elevator at the same time, one standing upon either side of the cross-brace B^2 , and each having his feet upon the treadles. The foot-rests of the treadles or reciprocating stands $F\ F'$ project inward, so as to overhang the rods or supports $f\ f'$ to a greater extent on the inside than on the outside, and are provided with guard-flanges $T\ T'$, so as to cause the feet of the operator to rest upon the stands in such position that his weight as applied to the treadles tends to swing or bear them inward and counterbalance the outwardly-projecting

under portions of the treadle-rods, as well as cause the rollers H H' to bear upon the uprights as the treadles reciprocate, thus creating less friction than would be produced by the working of the treadle-rods with their inner sides in contact with the walls of the slots in the platform. As the weight of the platform and mechanism carried thereby is balanced by the suspended weights and the rack-bars counterbalance each other, it is obvious that the operator has only his own weight to carry, with the friction of the working parts of the mechanism added. The motion of the feet and legs in working the treadles resembles somewhat the movements of those parts in going up stairs.

For use in stores, in place of step-ladders, by plasterers, indoor painters, and for similar purposes, I prefer to mount the base A upon rollers, and to arrange the guiding-frames I² I³, and parts carried thereby, as well as the brake-blocks and cross-pieces J, below the platform and treadles. The turning-bolt L, in such instance, might extend up through the post g of the lever G, which post should be made hollow, and the lever centrally forked, so as to rock on pivots outside of the post. In this manner, by omitting the top brace B², and carrying the weighted cords directly over the corner pulleys jj', the top of the platform would be unobstructed, and the operator could ascend as near the ceiling as desired, or raise himself from shelf to shelf of a store.

When the elevator is to be used for carrying weight other than that of the operator the weights on the cords should be increased, so as to counterbalance or nearly counterbalance such extra weight.

Several elevators in line with each other, and having boards stretching between their platforms, form an easily-adjusted scaffolding for brick-layers, painters, &c. In such cases one or two operators upon each elevator would enable the workmen to carry up the weight of the boards of the scaffolding as the work progresses.

I claim as of my invention—

1. The combination, in an elevator, of controlling-ways, a platform moving between said ways, reciprocating stands or treadles carried by the platform, and mechanism, substantially such as described, operated by the alternate action of the stands, whereby the platform is elevated step by step, as set forth.

2. The combination, substantially as hereinafore set forth, of upright ways, a counterbalanced platform moving up and down said ways, reciprocating stands carried by the platform, and mechanism, substantially such as described, for elevating the platform, actuated by the reciprocating stands.

3. The combination, substantially as hereinafore set forth, of controlling-ways, a platform moving between said ways, reciprocating rack-bars for elevating the platform, carried by the ways, and a rocking lever, upon

the opposite ends of which the rack-bars are supported.

4. The combination, substantially as hereinafore set forth, of the uprights, the platform, the reciprocating rack-bars, and clutches, carried by the platform, and automatically and alternately engaging with the rack-bars to connect the platform first with one rack-bar and then with the other, whereby the platform is elevated by the ascending rack-bar, while the other bar is left free to descend.

5. The combination, substantially as hereinafore set forth, of the ways, the platform, the reciprocating stands, the reciprocating rack-bars, and spring-dogs, carried by the stands, for alternately drawing down the rack-bars.

6. The reciprocating stands, provided with foot-rests above the platform, and with bearers and rollers below the platform, substantially as and for the purposes set forth.

7. The combination of upright ways, a platform moving up and down between said ways, ropes connected with the platform, and provided with weights moving in the ways, rack-bars reciprocating in the ways, a rocking lever, upon which the racks rest, clutches carried by the platform, and engaging with the racks, reciprocating stands carried by the platform, a rocking lever, upon the opposite ends of which the stands bear, and dogs carried by the stands, and engaging with the racks, these members being constructed and operating substantially as set forth.

8. The combination, substantially as hereinafore set forth, of the reciprocating racks moving in the platform-supporting uprights, spring-clutches carried by the platform, and a turning-shaft for simultaneously disengaging the clutches from the racks.

9. The combination, substantially as hereinafore set forth, of the platform-supporting uprights, pivoted brakes mounted on the platform, and the turning-shaft.

10. The combination of the platform-supporting uprights, the reciprocating rack-bars, the reciprocating dogs, the pivoted brakes, and the turning-shaft, these members being constructed and operating substantially as set forth.

11. The combination, substantially as hereinafore set forth, of the platform, its upright ways, the rack-bars, the spring-catches carried by the platform, and engaging with the rack-bars, the reciprocating stands carried by the platform, the dogs mounted upon the stands, and engaging with the rack-bars, the brake mechanism, the turning-shaft, and its lever.

In testimony whereof I have hereunto subscribed my name.

HERRMANN WOJAN.

Witnesses:

JOSEPH I. PEYTON,
H. T. EARNEST.