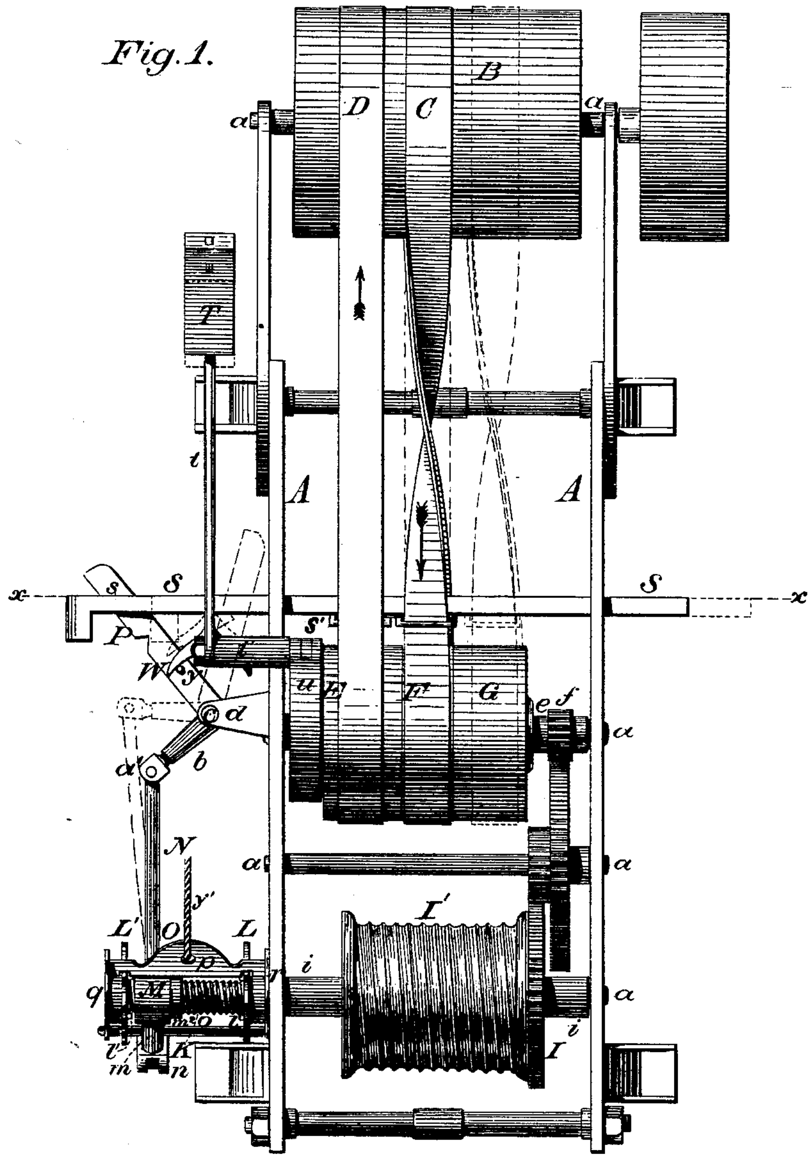
3 Sheets—Sheet 1.

J. AECKERLE.

BELT-SHIFTER FOR HOISTING ELEVATORS.

No. 188,834. Patented March 27, 1877.

Fig.1.



Attest:

C. F. Porter
Jno. A. Madigan

Inventor:

Jacob Aeckerle,
by Louis Bagger & Co.
Att'ys.

3 Sheets—Sheet 2.

J. AECKERLE.

BELT-SHIFTER FOR HOISTING ELEVATORS.

No. 188,834. Patented March 27, 1877.

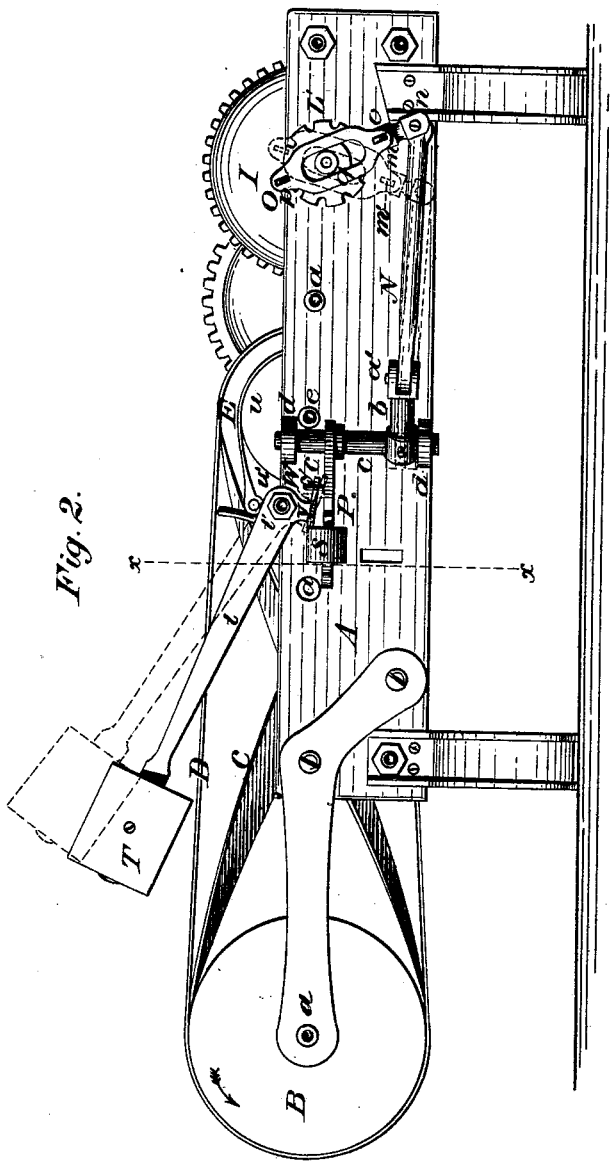


Fig. 2.

Attest:

C. F. Smith 2d

Jno. D. Madigan

Inventor:

Jacob Aeckerle

by Louis Bagger & Co.

Att'ys.

3 Sheets—Sheet 3.

J. AECKERLE.

BELT-SHIFTER FOR HOISTING ELEVATORS.

No. 188,834. Patented March 27, 1877.

Fig. 3.

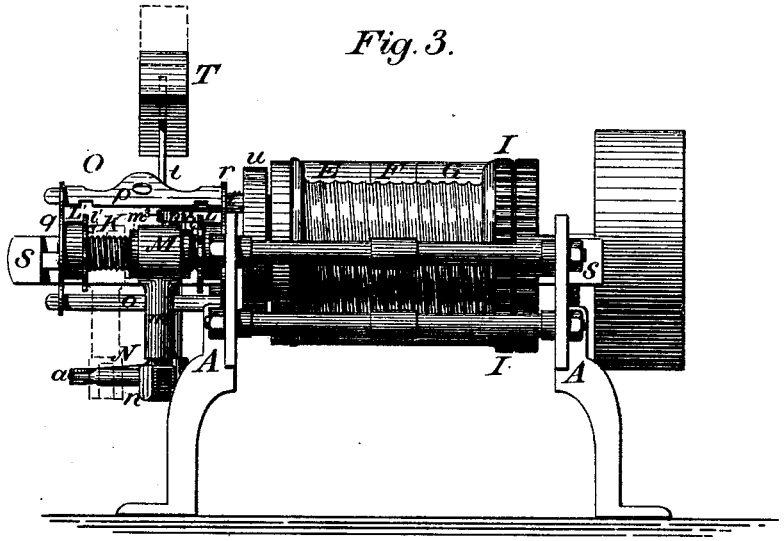
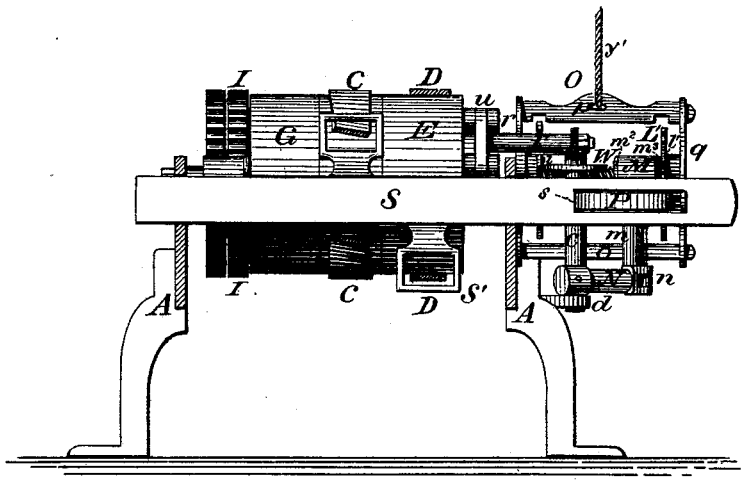


Fig. 4.



Attest:

C. F. Smith
Jno. W. Madigan

Inventor:

Jacob Aeckerle,
by Louis Bagger & Co.
Att'ys.

UNITED STATES PATENT OFFICE

JACOB AECKERLE, OF NEW YORK, N. Y.

IMPROVEMENT IN BELT-SHIFTERS FOR HOISTING-ELEVATORS.

Specification forming part of Letters Patent No. **188,834**, dated March 27, 1877; application filed July 28, 1876.

To all whom it may concern:

Be it known that I, JACOB AECKERLE, of New York city, in the county of New York, and State of New York, have invented certain new and useful Improvements in Hoisting-Elevators; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to that class of hoisting-elevators that are used principally in hotels for the accommodation of guests wishing to ascend to, or descend from, the upper stories, or in warehouses, &c.; and it consists in the construction and arrangement of a self-adjustable stop or governor, so constructed and arranged that the elevator will reverse its course automatically when it has reached the top or bottom of its travel, without reversing the engine, substantially as hereinafter more fully explained.

On the three sheets of drawings hereto annexed, Figure 1 represents a top plan. Fig. 2 is a side elevation. Fig. 3 is an end view, and Fig. 4 is a vertical section in the plane indicated by the lines *x x* in Figs. 1 and 2.

Similar letters of reference indicate corresponding parts in all the figures.

A is the frame, having bearings *a* at one end, in which the driving-pulley B, operated by the crank of the engine, is hung. C and D are endless belts, passing from the driving-pulley B to pulleys E, F, and G, the central one of which, F, is rigidly affixed upon the shaft *e*, while E and G are loose pulleys. Shaft *e* has a pinion, *f*, which engages, by intermediate gearing, with cog-wheel I, on the drum-shaft *i*. The latter terminates in a screw, denoted by K, which projects outside of frame A, as shown in the top plan, Fig. 1. At each end of this screw, and rigidly affixed thereto, is a notched disk, L and L′, each having a pin, *l* and *l′*, projecting from its inside face. M is a female screw, sliding upon and operated by the screw K, and having a downward-projecting arm, *m*, to the end of which is affixed a swivel-joint, *n*, coupling with the rod N. The downward-projecting arm *m* has a vertical slot, *m′*, within which slides the lower arm *o* of the sliding regulating-frame O. The latter consists of the horizontal arms *o* and *p*, united by side pieces *q* and *r*, so as to form a rectangular frame sliding up and down, the side pieces of which, *q* and *r*, are slotted, so as to slide upon the shaft *i* at each end of its screw K. The rod N is coupled to a swivel-joint, *a′*, affixed upon one end of arm *b*, which is rigidly affixed upon shaft *c*, having its bearings in brackets *d*, projecting from the side of frame A. Upon the shaft *c*, between the brackets *d*, is affixed a lever-arm, P, the front end of which slides in horizontal slot *s* in the belt-shifter S. The latter slides in slots in the frame A, and has belt-holders S′ of the usual construction, by which, when the shifter S is moved in either direction, the belts C and D may be shifted from off their respective loose pulleys E and G, onto the central fixed pulley F, thereby causing the latter, with its shaft *e*, to revolve to the right or to the left, according to whether belt C or D engages with it.

Affixed in the upper arm *p* of the regulating-frame O is a rope or chain, *y′*, that passes up through the elevator-shaft, either through the elevator-platform, or alongside of it, so as to be within easy reach of the operator or passengers on the platform. By pulling this rope *y′*, the frame O will be lifted, and its under cross-arm *o* will engage with one of the notches in each of the notched disks L L′. When the hold upon rope *y′* is let go, the frame O will drop down by its own weight, thus disengaging the arm *o* from the notches in the disks L and L′.

The operation of my improvement will be readily understood by reference to the drawings in connection with the foregoing description. Supposing the driving-pulley B to be rotated by the engine continually in the direction of the arrow, the crossed belt C, being in the position indicated in the drawings, will rotate the fixed pulley F in the direction of the arrow, which is opposite to that of the driving-pulley B. The result will be that the shaft *e*, pinion *f*, cog-wheel H, pinion *h*, drum cog-wheel I, and drum-shaft *i*, will all be operated, the female screw M gradually advancing upon screw K toward the pin *l′* on the

disk L′. Screw M has two projecting shoulders, denoted by m^2 and m^3, one of which, m^3, will, when the screw M shall have reached disk L′, engage with the pin l' that projects from its inside face in such a manner that screw M and its downward-projecting arm m will be tilted or partly rotated, thereby, through the swivel-joint n, pushing upon rod N, that connects with swivel-joint a', arm b, vertical shaft c, and lever-arm P, causing the latter to press against that side of slot s in the belt-shifter S that is nearest to frame A; or, in other words, shifting the belt C from off the fixed pulley F onto the loose pulley G, and shifting belt D from off the loose pulley E onto the fixed pulley F, thereby, of course, reversing the rotations of pulley F and shaft e, and, with it and the intermediate pinions and cog-wheels, also reversing drum-shaft i, drum I′, and screw K. The reversion of the latter will cause screw M to travel in the opposite direction, and it will now approach disk L until, when it shall have come sufficiently near to this to have pin l engage with its shoulder m^2, screw M, with its downward-projecting arm m, will be partly tilted or rotated in the opposite direction, thus pulling upon rod N, arm b, and lever-arm P, thereby moving the belt-shifter out, and again shifting belt C from off the loose pulley G onto fixed pulley F, while at the same time belt D is shifted from off F onto loose pulley E, and the motion of the elevator is again reversed. If, at any time, during the upward or downward travel of the platform, it is desired to reverse its course, this is effected by pulling the rope y', the result of which will be that the lower arm o of frame O will engage with the notches in the disks L and L′, so as to partly, by the rotations of said disks, tilt frame O, and with it the downward-projecting arm m of the screw M, which is governed by the arm o passing through its vertical slot m^1. Whether the screw M and its downward-projecting arm m are shifted or partly rotated automatically by its shoulders m^2 and m^3 coming in contact with the projecting pins l or l' of the disks L and L′, or by the arm o engaging with the notches in the latter, (this being accomplished by the operator pulling the rope y',) the result will be the same, viz., to shift the belts, and thereby reverse the motion of the elevator.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination of the belt-shifter S, having slot s, with the bent lever-arm P b, pivoted at c, connecting-rod N, and female screw M, having downward-projecting arm m, substantially as and for the purpose shown and specified.

2. The combination of the female screw M, having downward-projecting slotted arm m, with the sliding cross-piece o of the regulating-frame O, substantially as and for the purpose shown and specified.

3. In combination with the drum-shaft i, terminating in screw K, and having solid toothed disks L L′ provided with projections l l' upon their inner faces, the female screw M having lateral projections m^2 m^3 and downward-projecting slotted arm m, substantially as and for the purpose shown and specified.

4. The regulating-frame O, consisting of slotted side pieces q r and cross-pieces o p, in combination with the toothed disks L L′ affixed solidly upon drum-shaft i, substantially as and for the purpose herein shown and specified.

5. The combination of drum-shaft i, terminating in screw K, and having solid toothed disks L L′ provided with projections l l' upon their inner faces, female screw M, having lateral projections m^2 m^3 and downward-projecting slotted arm m, vertically-sliding frame O, the lower cross-piece of which slides in the slotted arm m, connecting-rod N, bent lever P b, and belt-shifter S, having slot s, all arranged to operate substantially as and for the purpose shown and specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JACOB AECKERLE.

Witnesses:
JOHN A. WILSON,
WILLIAM BLUME.