

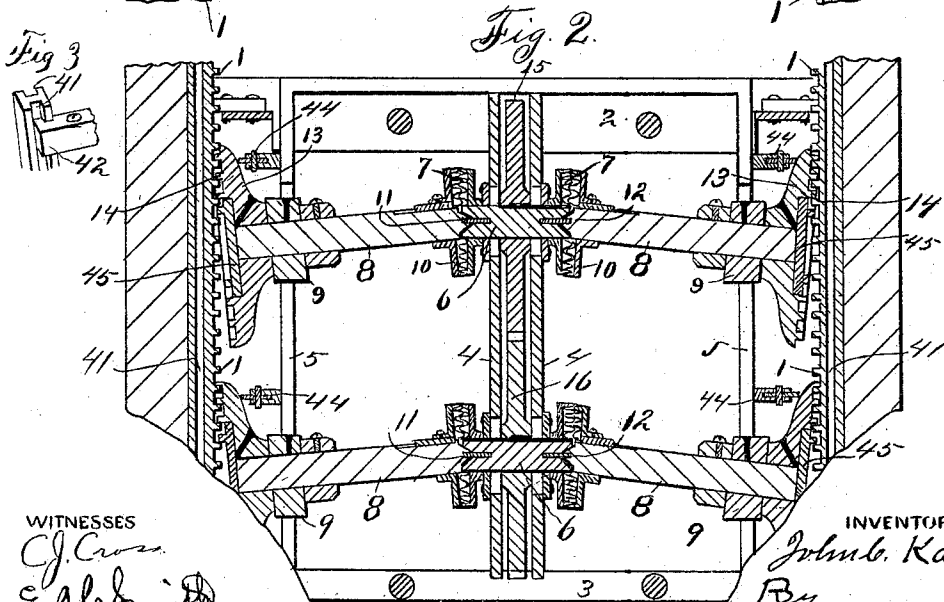
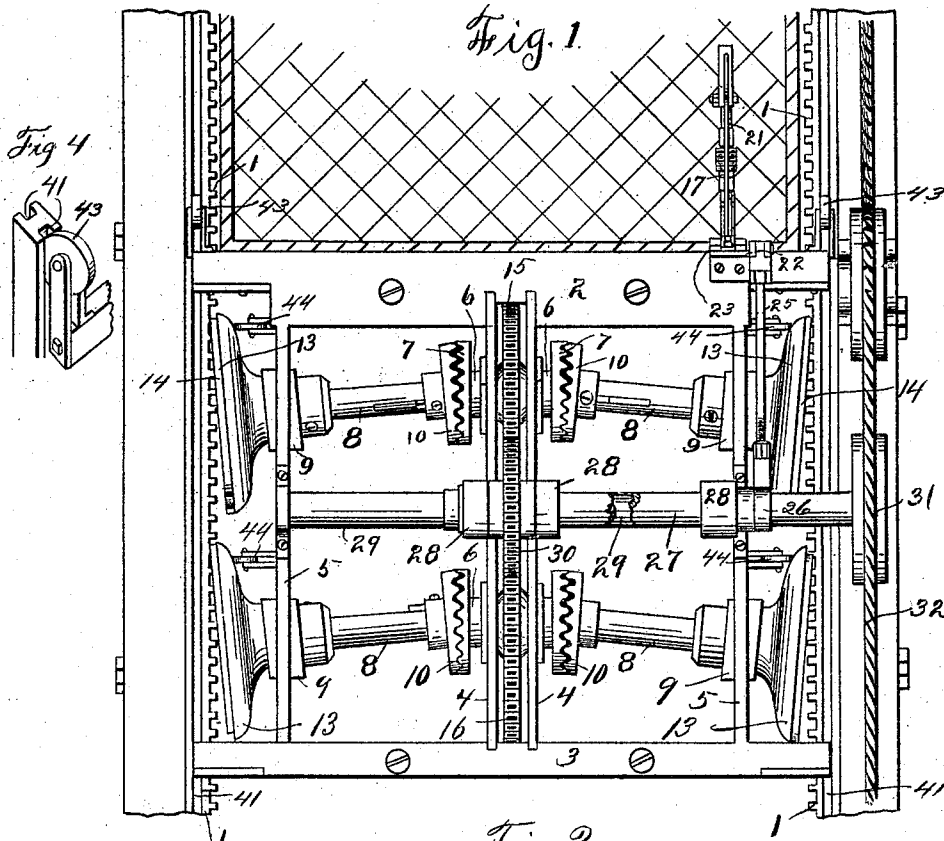
(No Model.)

2 Sheets—Sheet 1.

J. C. KAILEY.
ELEVATOR.

No. 534,959.

Patented Feb. 26, 1895.



WITNESSES
C. J. Cross
E. L. Smith

INVENTOR
John C. Kailey
By
Frederic W. Bond
Attorney

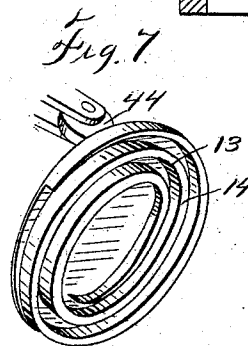
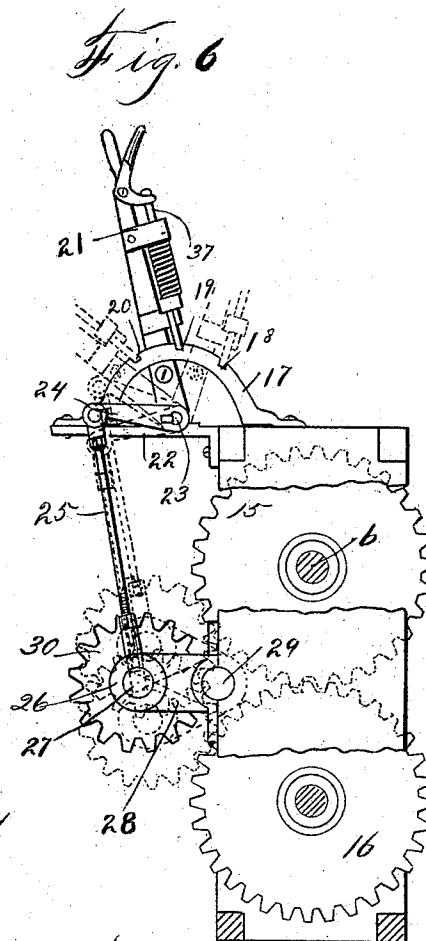
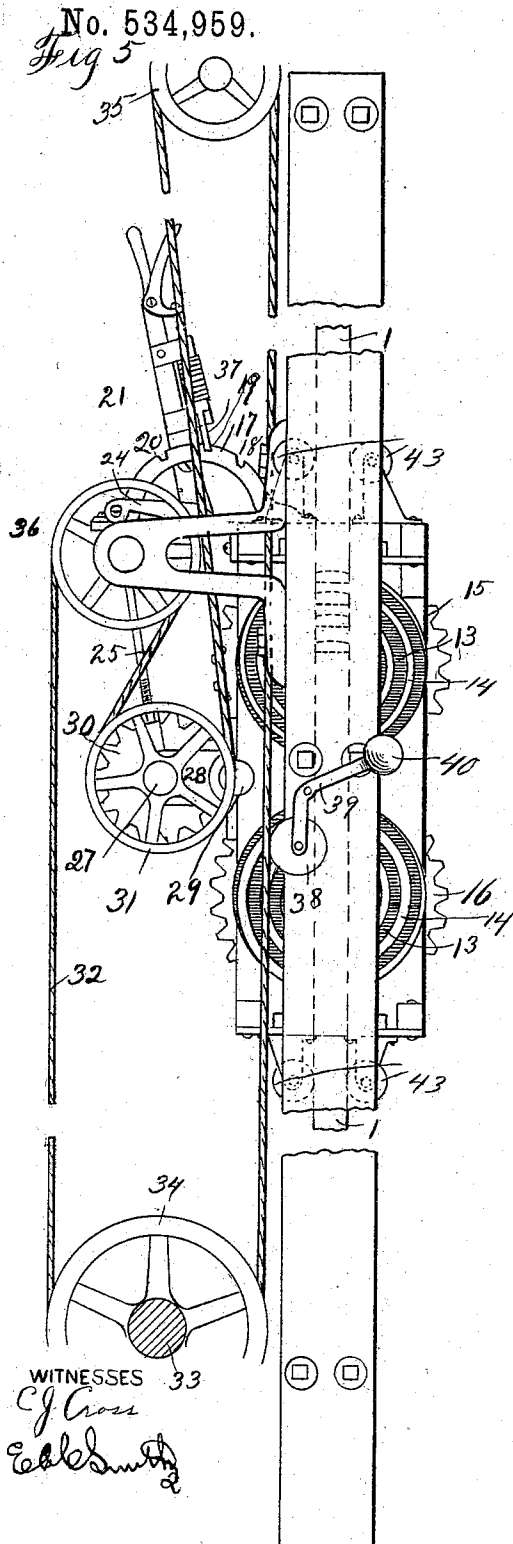
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JOHN C. KAILEY, OF CANTON, OHIO, ASSIGNOR OF FOUR-FIFTHS TO CHARLES L. BOOTH, OF SAME PLACE, AND GEORGE B. MILLER, OF CLINTON, OHIO.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 534,959, dated February 26, 1895.

Application filed November 19, 1894. Serial No. 529,277. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. KAILEY, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have
5 invented certain new and useful Improvements in Elevators; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of
10 this specification, and to the figures of reference marked thereon, in which—

Figure 1, is a side elevation of the gearing and its different parts. Fig. 2, is a longitudinal section of the worm disks and their
15 shafts and different parts belonging thereto. Fig. 3, is a view showing a portion of one of the toothed bars, and one of the guides properly located with reference to said toothed bar. Fig. 4, is a similar view, showing the
20 guide wheel properly attached. Fig. 5, is an edge view of the elevator frame, showing the location of one set of the worm disks, and the different parts to communicate rotary motion to the worm disk. Fig. 6, is a view, showing
25 the shifting lever, its segment and different parts belonging thereto. Fig. 7, is a detached view of one of the worm disks, showing the position of its backing wheel, also omitting the wooden disk.

30 The present invention has relation to elevators, and it consists in the different parts and combination of parts hereinafter described, and particularly pointed out in the claims.

35 Like numbers represent corresponding parts in all of the figures of the drawings.

In the accompanying drawings 1, represents the toothed bars, which are located upon the inner sides of the elevator shaft, and are of a length to correspond with the
40 length of travel designed to be given to the elevator proper. If the bars 1 are to be of considerable length I prefer to form said bars in sections, and place the sections together so as to form continuous toothed bars from the
45 top to the bottom of the elevator shaft in the event the car is to travel that distance. The toothed bars 1, are to be so arranged that they will be parallel to each other throughout
50 their entire length.

The elevator frame which is to be located

below the car may consist of the bars 2, 3, 4 and 5, which bars are preferably located and arranged substantially as shown in Figs. 1 and 2, which arrangement is the best for ar-
55 ranging the different parts to be attached to said frame. The elevator car is to be attached to the bar 2 in any convenient manner, and may be of any desired kind or style, reference being had to the purpose for which
60 the car is to be used.

To the bars 4, are journaled the shafts 6, which shafts are located substantially as shown in Figs. 1, 2, and 6, and as shown said
65 shafts are provided with the toothed wheels 7, said wheels being securely attached in any convenient and well known manner, to the shafts 6.

The shafts 8 are properly journaled by means of the boxes 9, which boxes are at-
70 tached in any convenient and well known manner to the bars 5 or their equivalents. The shafts 8, are provided at their inner ends with the toothed wheels 10, which toothed wheels are so located and arranged that their
75 teeth will interlace or mesh with the teeth of the toothed wheels 7.

The shafts 6 and 8 are held in proper position with reference to each other by means of the socket connections 11, and the pins 12, 80 said parts being located and arranged substantially as shown in Fig. 2. To the outer ends of the shafts 8, are securely attached in any convenient and well known manner, the worm-disks 13, which worm-disks are pro-
85 vided upon their faces with the worms or screw-threads 14, which screw-threads may be of any desired pitch, reference being had to the use to which the elevator proper is to be put. In the drawings the worms or screw-
90 threads 14 are shown single, but it will be understood that they may be doubled if so desired, inasmuch as the same arrangement of the different parts can be employed in either
95 event. For the purpose of causing the screw-threads 14 to engage the teeth of the toothed bars 1 only upon one side of their horizontal centers, said disks are set at an angle, as illustrated in Figs. 1 and 2, thereby allowing the
100 reverse part of the disks to be disengaged from the teeth upon the bars 1.

For the purpose of providing a means for

inclining the worm-disks 13, the shafts 8 are also inclined to correspond with the inclination of the worm-disks, and in order to connect the inclined shafts 8 with the horizontal shafts 6, the toothed wheels 7 and 10 are provided, and the teeth so arranged that said wheels can stand or set at an angle to each other, and at the same time a sufficient number of the teeth interlace to communicate rotary motion to the inclined shafts 8, and their worm disks 13.

To the shafts 6 are securely attached the cog wheels 15 and 16, which wheels are so located and arranged that they will mesh with each other, and thereby communicate rotary motion to all of the worm-disks 13, and for the purpose of causing the worm-disks to rotate in unison the cog wheels 15 and 16 are of the same size and provided with an equal number of teeth.

It will be understood that the cog wheels 15 and 16, will rotate in opposite directions, thereby causing the respective worm-disks to rotate in opposite directions, and for the purpose of causing all of the screw-threads 14 to act alike, each set of the worm-disks must be provided with right and left hand screw-threads; that is to say if the upper disks 13 are provided with right hand screw-threads the lower disks must be provided with left hand screw-threads or vice versa.

To the bar 2 or its equivalent is attached the notched segment 17, which notched segment is provided with the notches 18, 19 and 20, which notches are for the purpose hereinafter described.

For the purpose of providing a means for pivotally attaching the lever 21, and at the same time connecting the outer end of the segment 17, the arm 22 is provided, which arm is securely attached to the bar 2 or its equivalent, said arm having journaled thereto the shaft 23, to which shaft is securely attached the arm 24, and to the outer of said arms is attached the connecting rod 25, which connecting rod is extended downward and connected to the collar 26, said collar being loosely mounted upon the shaft 27, which shaft is held in proper position by means of the arms 28, which arms are pivotally connected to the cross bar 29, said cross-bar being securely attached in any convenient and well known manner to the bars 5 or their equivalents.

To the shaft 27, is securely attached the cog wheel 30, which cog wheel is located in true alignment with the cog wheels 15 and 16, and is so located for the purpose hereinafter described. To the outer end of the shaft 27 is attached a pulley 31, which pulley is for the purpose of communicating rotary motion to the shaft 27, by means of the cable 32 or its equivalent.

In use the power shaft 33 is preferably located at the bottom of the elevator shaft proper, and is properly connected by belt or otherwise to a motor of any desired kind or style. Upon the shaft 33 is located and se-

curely fixed the wheel 34, and directly over the wheel 34 is located the pulley 35, which pulley is located at the top or upper portion of the elevator shaft.

The cable 32 is extended from the wheel 34 upward and over the wheel 35, and thence downward and under the wheel 31, thence upward and over the idler 36, and thence downward under the wheel 34. The object and purpose of locating the cable 32, as illustrated in Fig. 5, are to provide a means for covering a sufficient amount of the periphery of the wheel 31 to prevent the cable from slipping upon the periphery of the wheel 31.

When it is desired to stop the car at any desired point in the elevator shaft, the sliding bar 37 is set in the notch 19, which disengages the cog wheel 30, from the wheels 15 and 16, at which time the motor is free to run without communicating rotary motion to any of the parts, except the wheels 31, the cog wheel 30, and the different pulleys over and around which the cable passes.

When it is desired to impart motion to the elevator car or carriage, the sliding bar 37 is disengaged from the notch 19 after which the lever 21 is moved so as to engage the sliding bar 37 with one of the notches 18 or 20, reference being had to the direction the carriage is to be moved, which movement engages the cog wheel 30 with one of the wheels 15 or 16, thereby communicating rotary motion to said wheel 15 or 16 and at the same time rotary motion is communicated to the worm disks 13, which rotary motion of the disks 13 elevates or lowers the carriage, reference being had to the direction of motion given to the disks. It will be understood that by shifting the wheel 30 from one wheel to the other of the wheels 15 or 16 the direction of motion of the disks 13 will be changed.

It will be understood that reversing the position of the lever 21 will reverse the motion of the worm-disks 13, thereby reversing the motion of the elevator carriage.

It will be understood that as the lever 21 is moved the shaft 27 will follow the movements of said lever by means of the arm 24, and the connecting rod 25, said shaft 27 describing the arc of a circle, the center of which is the center of the cross-bar 29.

It will also be understood that the cog wheel 30 and the wheel 31 will follow the movements of the shaft 27. For the purpose of regulating the tension of the cable 32, the pulley 38 is provided, which pulley is journaled to the bottom or lower end of the arm 39; the opposite end of said arm being provided with the counter-weight 40.

The toothed bars 1, are each provided with the grooves 41, which grooves are located substantially as shown in Figs. 3 and 4, and are for the purpose of receiving the notched plates 42 and the traveling wheels 43. The object and purpose of providing the grooves is to prevent any accidental displacement of the worm disks 13, and at the same time caus-

ing the frame carrying the gearing to communicate rotary motion to the worm disks to move up and down in true alignment with the toothed bars 1.

5 For the purpose of preventing the worm disks 13 from springing so as to disengage their screw-threads from the teeth of the bars 1, the backing wheels 44 are provided, which backing wheels are located substantially as shown in Figs. 1 and 2.

For the purpose of providing a means for properly lubricating the screw-threads 14, the worm disks 13 are provided with the wooden or porous disks 45, which disks may be provided with a screw-thread corresponding in size and pitch with the screw-threads formed upon the worm disks 13, but this is not absolutely necessary as the only object in providing the wood disks 45, is to provide a means 15 for allowing oil to percolate through said disks and find its way onto the screw-threads 14.

The cable 32 is simply for the purpose of communicating rotary motion to the worm disks 13 by means of the gearing described, and hence a belt may take the place of the cable, inasmuch as the elevator car or carriage is not supported by the cable, and if in the event the cable or belt should break from any cause the elevator car or carriage will not drop or fall, said car being held by means of the toothed bars 1, and the worm disks 13, thereby providing an elevator that will be absolutely safe.

The inclined shafts 8, are formed in pairs or sets, and one set located above the other, thereby providing two sets of worm disks, located one above the other.

In use it will be understood that the frame carrying the gearing may be properly inclosed for the purpose of preventing accidents.

40 Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of an elevator shaft, 45 provided with the toothed bars 1, a frame provided with the shafts 6 the wheels 15 and 16 mounted upon the shafts 6, the toothed wheels 7, the inclined shafts 8, the toothed wheels 10 mounted upon the inclined shafts 8, the worm disks 13 secured to the shafts 8, the shaft 27, the wheel 30 mounted upon the shaft 27, the pivoted arms 28, the cross-bar 29, and means for swinging the shaft 27, substantially as and for the purpose set forth.

55 2. The combination of an elevator shaft, provided with the toothed bars 1, provided with the grooves 41, a frame carrying worm disks, said worm disks having right, and left hand screw-threads, the shafts 6, provided

with the cog-wheels 15 and 16, the cog-wheel 60 30 located between the wheels 15 and 16, and mounted upon the swinging shaft 27, and means for swinging said shaft 27, substantially as and for the purpose set forth.

3. The combination of an elevator shaft, 65 provided with the toothed bars 1, a frame carrying the shafts 6, 8, and 27, the toothed wheels 7, and 10, the worm disks 13, located at an angle to the toothed bars 1, the cog-wheels 15 and 16, the swinging shaft 27, the cog wheel 70 30 mounted upon the shaft 27, and means for swinging the shaft, substantially as set forth.

4. The combination of an elevator shaft, provided with the toothed bars 1, a frame carrying the shafts 6, the inclined shafts 8, provided with the worm disks 13, the wooden or porous disks 45 attached to the worm disks and means for rotating the worm disks, substantially as and for the purpose set forth.

5. The combination of an elevator shaft, 80 provided with the parallel toothed bars 1, a frame provided with the inclined shafts 8, the worm disks 13 mounted upon the inclined shafts 8, the shafts 6 located between the inclined shafts 8, the socket connections 11, 85 and the toothed wheels 7 and 10, substantially as and for the purpose set forth.

6. The combination of an elevator shaft provided with the toothed bars 1, the worm disks located at an angle to the toothed bars, 90 and provided with screw-threads meshing with the toothed bars, the swinging shaft 27 provided with the pulley 31, a belt or cable located at one side of the elevator shaft and extended from the lower portion of the shaft 95 to the upper portion thereof, the idler 36, the arm 39 provided with the wheel 38, and the counter-weight 40, substantially as and for the purpose specified.

7. The combination of an elevator shaft 100 provided with toothed bars 1, a frame provided with the shafts 8, formed in sets or pairs, the worm disks 13, secured to said shafts 8, the shafts 6 located between the inner ends of the inclined shafts 8, the cog wheels 15 and 16, mounted upon the shafts 6, the cog wheel 30, mounted upon the swinging shaft 27, the toothed wheels 7 and 10, and the backing wheels 44, substantially as and for the purpose specified. 110

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JOHN C. KAILEY.

Witnesses:

F. W. BOND,

E. A. C. SMITH.