(No Model.) 2 Sheets—Sheet 1.

T. W. GRAHAM.

ELEVATOR GATE OPERATING DEVICE.

No. 499,357. Patented June 13, 1893.

Fig. 1.

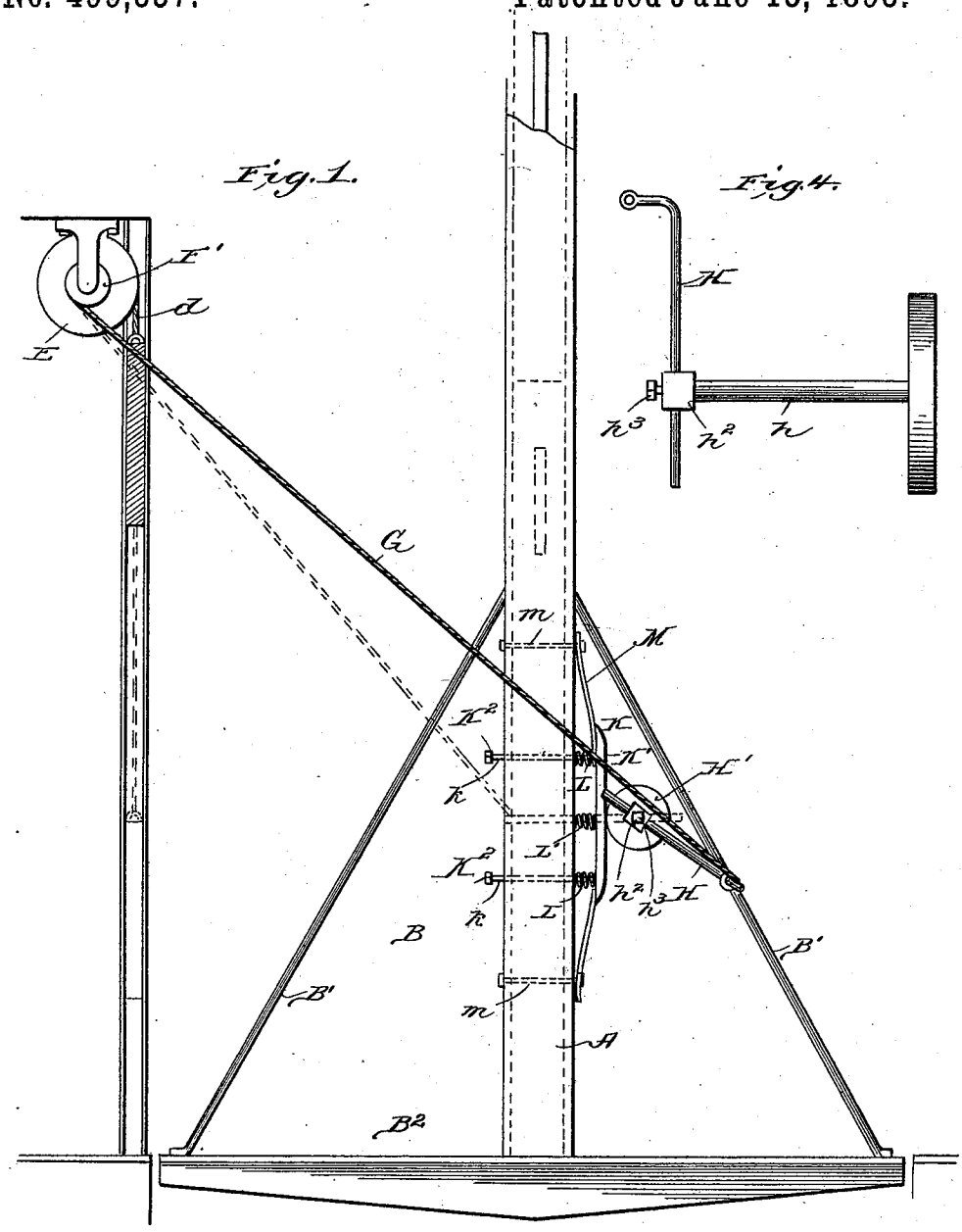

Fig. 4.

Witnesses:
Harry S. Rohrer
Wm. DuVal Brown

Inventor:
Thomas W. Graham
By. R. S. Bacon
Attorney.

(No Model.) 2 Sheets—Sheet 2.

T. W. GRAHAM.

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Fig. 2.

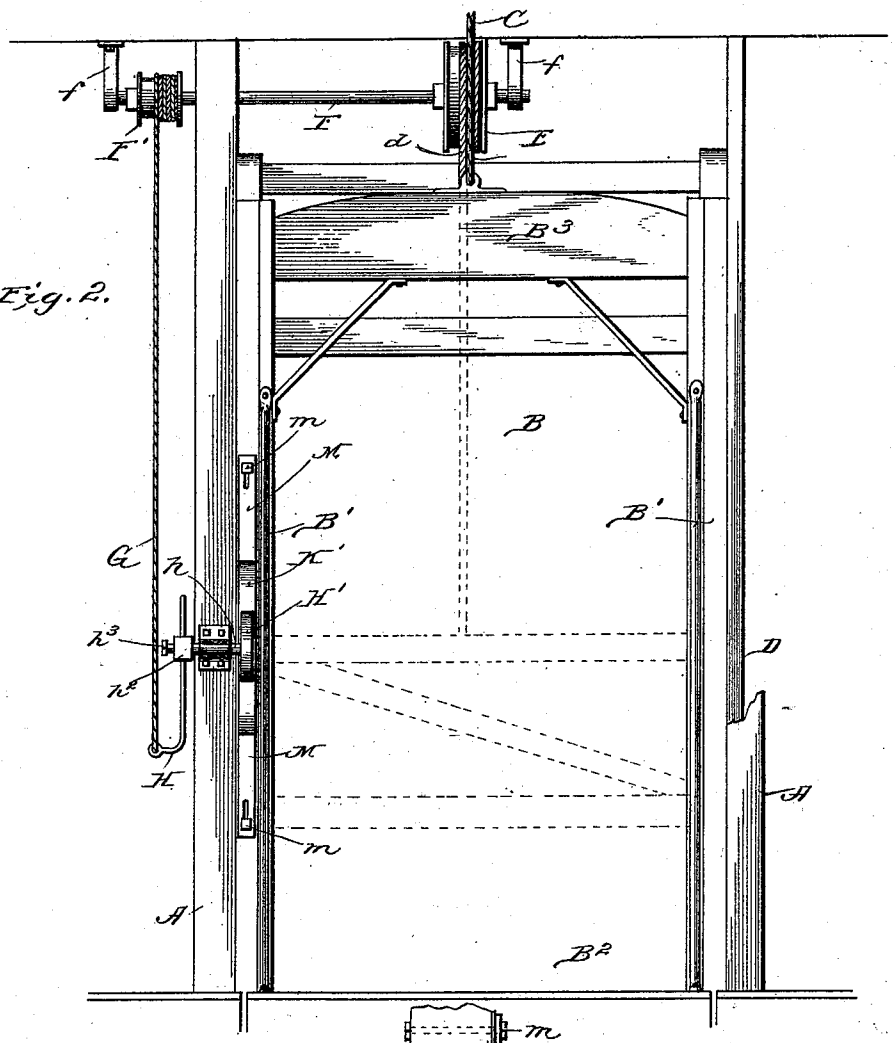
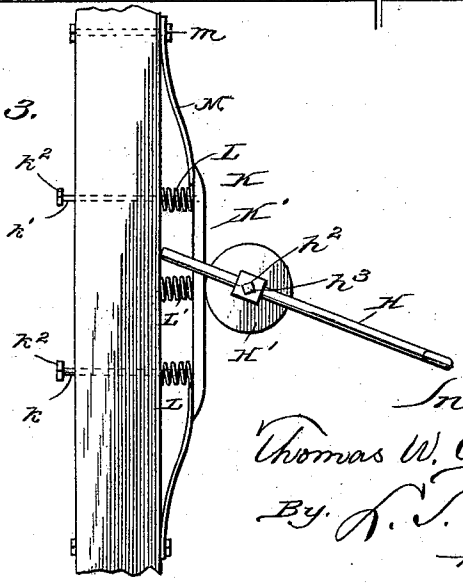


Fig. 3.



Witnesses:
Harry B. Arthur.
Wm. DuVal Brown

Inventor
Thomas W. Graham
By. L. S. Bacon
Attorney

UNITED STATES PATENT OFFICE.

THOMAS WILLIAM GRAHAM, OF DUBUQUE, IOWA.

ELEVATOR-GATE-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 499,357, dated June 13, 1893.

Application filed September 21, 1892. Serial No. 446,462. (No model.)

To all whom it may concern:

Be it known that I, THOMAS WILLIAM GRAHAM, a citizen of the United States, residing at Dubuque, in the county of Dubuque and State of Iowa, have invented certain new and useful Improvements in Elevator-Gate-Operating Devices; 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.

This invention relates to an improvement in means for opening elevator hatch ways and it consists in the construction and arrangement of parts hereinafter described and definitely pointed out in the claims.

The aim and purpose of this invention is to provide improved and simplified means for raising or opening the gates of elevator shafts, by the movement of the carriage, which means will be accurate and positive in its working. This object is attained by the construction illustrated in the accompanying drawings wherein like letters of reference indicate corresponding parts in the several views and in which—

Figure 1 is a sectional elevation of a section of elevator shaft, the car and the means for actuating the gate. Fig. 2 is an elevation looking from the rear. Fig. 3 is a detail view of the friction track, and Fig. 4 is a detail view of the friction wheel and crank.

In the drawings A represents guides or side posts of the elevator well, B the elevator having the side supporting standards B′, the platform B^2 and the cross-beam B^3 to which the cable C is attached. The standards have suitable tongues engaging in the guides of the shaft, as is usual in elevator constructions.

The gate for which this invention is preferably adapted is of, although not necessarily limited to, the vertically sliding pattern, moving in grooves at the sides of the well, and is represented at D. A suitable elevating cord *d* is attached to the upper edge of the gate, its upper end extending up and being attached to a winding drum E, mounted on a shaft F, above the gate way. The shaft F, is journaled in hangers *f* one located near the drum E and the other a short distance beyond the side of the plane of the guides of the elevator shaft. On the outer end of the shaft F is a pulley F′, of a diameter less than the diameter of the drum, and from the pulley a cord G, extends at an incline down on the outside of the elevator shaft, its end being connected to the free end of a crank H, which is attached to a horizontal shaft *h* journaled in a suitable bearing in the adjacent guide post of the elevator well, to one side of the guide way.

The crank H, is fitted in a socket h^2 in the end of the shaft *h* and adjustably held therein, by a set screw h^3 passing through the end of the shaft, and engaging the crank. By means of this adjustable feature the extent of the movement of the gate may readily be varied. On the inner end of the shaft *h* is keyed a friction disk H′ its periphery extending to a point adjacent to the path of the car-standard at that side.

In the employment of a rack and pinion in this class of gate actuating devices, great irregularities and damages are frequently met with, owing to the tilting or oscillating movement of the car, which not unfrequently throws the gear out of mesh with the teeth of the rack, and also causes an irregular engagement of the teeth which binds or breaks the device. To overcome these apparent defects, and to render the contact, necessary for the operation of the gate actuating means, perfect at all times as well as noiseless, I secure on the edge of the car standard on the side next to the friction disk or disks a suitable track K, which is of the following construction: The track proper consists of a bar K′ preferably of wood, held parallel with the standard by suitable bolts *k k′* preferably, which are fixed in the track and loosely fitted in apertures in the standard, through which they freely pass, they being prevented from sliding out by suitable nuts k^2 on their ends. Sleeved on the bolts *k k′* are spiral springs L their ends abutting against the outer face of the standard and the inner face of the track, and intermediate these springs is another coiled spring L′ secured to the track and standard in any desirable manner. These springs act as cushions and normally hold the track out to a point which carries the nuts on the bolts into contact with the standard, and the track beyond the plane, of the periphery of the disk. The ends of the track are bev-

eled on their outer faces and have attached to their under sides, curved springs M, which curve downward, their outer ends being perforated with elongated slots through which suitable bolts *m* pass, holding the same in perfect alignment with the standard. These springs M act as inclined extensions of the track as well as assisting the springs L to force the track out and increase the frictional contact between the same and the disks. They may be made of sufficient strength to entirely supplant the necessity of the coil springs if found desirable.

As the gate descends by gravity the cord G is wound on the pulley F, and the cord *d* unwound from the drum, the crank assumes a position directly opposite that shown in full lines Fig. 1 inclining toward the gate. When the car passes down the friction disk engages the inclined springs forcing the same with the end of the track down, when the further continued movement of the car carries the track into contact with the friction disk, turning the same to the left as shown in dotted lines Fig. 1, carrying the crank over to its extreme position, unwinding the cord on the pulley and winding the gate cord on the drum. The relative difference in the size of the pulley and drum will cause the necessary elevation of the gate with a comparatively limited movement of the crank. When the car passes up the crank is turned to the right, the result being the same as when the car is descending.

It is obvious that slight changes in the construction and arrangement of the parts of the device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. In an elevator, the combination with the guides of the elevator well, of a car, a gate for the well, a shaft located above the gate carrying at opposite ends a drum and pulley respectively, a cord connected with the drum and gate, a crank mounted on a guide, a friction disk connected with the crank, a cord connected between the crank and pulley, and a yieldingly supported track on the car, arranged to engage the friction disk, substantially as described.

2. In a gate operating means for elevators, the combination with a support, a gate and car, of an adjustable crank arm mounted on the support, a friction disk connected with the arm, a laterally movable track on the car arranged in the plane of the disk, and to engage said disk springs for forcing the track out and a connection between the crank and gate, substantially as described.

3. In an elevator gate operating means, the combination with a car of a yielding track thereon consisting of a track proper inclined springs at the end of the track and springs in the rear of the track and between the same and the car, a friction disk arranged to engage the track, a crank connected with the disk, a gate and a connection between the gate and crank, substantially as described.

4. In an elevator gate actuating device, the combination with a car, of a yielding track on the car, a friction disk arranged with its periphery in the path of the track and mounted on a shaft journaled in a stationary bearing, an adjustable crank arm connected with the disk, a gate and a connection between the gate and crank, substantially as described.

5. In an elevator gate operating device, the combination with the guides of the elevator well, and a vertically movable gate, of a shaft journaled above the gate, a drum on the shaft a connection between the drum and gate, a pulley of a diameter less than the diameter of the drum, a crank arm having connections with the pulley, a shaft to the guide on which shaft the arm is secured, a friction disk on the opposite end of the crank shaft, and a car having a yielding track on a part thereof projecting out into the plane of the periphery of the disk, substantially as described.

6. In a gate operating means for elevators, the combination with a support, a gate and car, of a crank arm mounted on the support, a friction disk stationarily supported and connected with the arm, a laterally movable track on the car arranged in the plane of the disk, and to engage said disk springs for forcing the track out and a connection between the crank and gate, substantially as described.

7. In a gate operating means for elevators, the combination with a fixed support, gate and car, of a track on the side of the car, a shaft carried by the support, a crank on one end of the shaft, a friction disk on the opposite end of the shaft, yielding means for forcing the disk and track into close contact and connections between the crank and gate, substantially as described.

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

THOMAS WILLIAM GRAHAM.

Witnesses:
T. H. McCARTHY,
H. C. KOEHNLEIN.