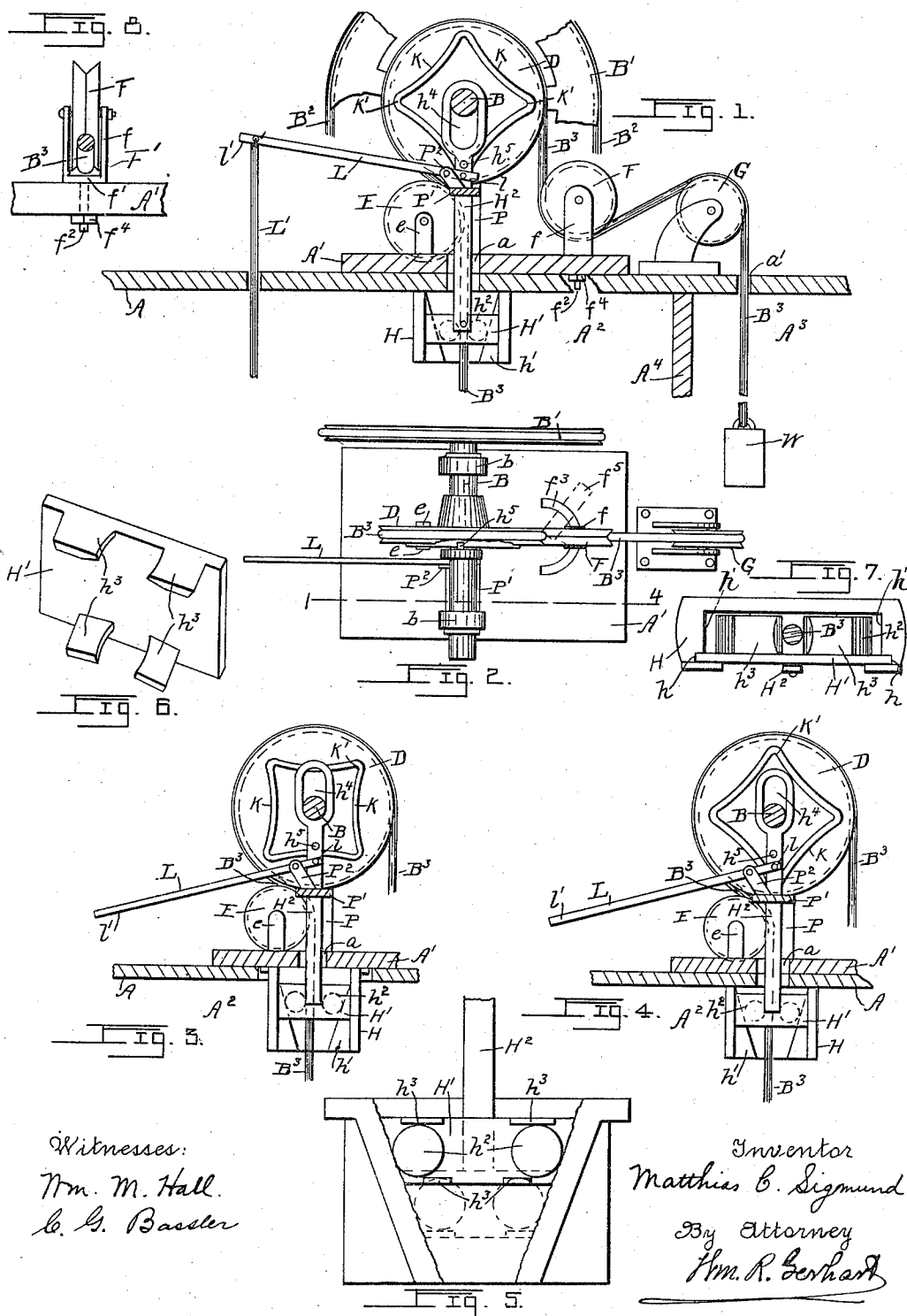


M. C. SIGMUND.
ELEVATOR.

Patented Mar. 23, 1897.



UNITED STATES PATENT OFFICE.

MATHIAS C. SIGMUND, OF READING, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOEL P. SCHELLY, OF PHILADELPHIA, PENNSYLVANIA.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 579,410, dated March 23, 1897.

Application filed March 24, 1896. Serial No. 584,588. (No model.)

To all whom it may concern:

Be it known that I, MATHIAS C. SIGMUND, a citizen of the United States, residing at Reading, in the county of Berks, State of Pennsylvania, have invented certain Improvements in Elevators, of which the following is a specification.

This invention relates more particularly to improvements in dumb-waiters, though it is also applicable to other classes of elevators; and the objects of the improvements are, first, to arrest the descent of the cage or platform independently of any of the wheels or pulleys of the elevating mechanism connected therewith; second, to automatically arrest the descent of the cage or platform by cutting off or detaching the power that lowers the same; third, to set the brake so that the cage or platform may descend by gravity, and, fourth, to regulate the position of the pulley carrying the rope to the counterweight, that the same may be adjusted relative to the position of the weight-pocket.

The invention consists in mechanism adapted to arrest the descent of the cage or platform independently of any of the wheels or pulleys of the elevating mechanism.

The invention consists, also, in the construction and combination of the various parts, as hereinafter fully described, and then pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of the operating mechanism, showing the brake applied to the hoisting-rope; Fig. 2, a top plan view, a portion of the cam-pulley being cut away; Fig. 3, a side elevation of the cam-pulley and brake, the latter being shown disengaged from the hoisting-rope by the cam; Fig. 4, a similar view, but showing the brake disengaged from the hoisting-rope by the brake-lever; Fig. 5, a rear view of the brake-case, the back being broken away to show the interior mechanism; Fig. 6, a perspective view of the inner face of the keeper-plate; Fig. 7, a top view of the brake mechanism, and Fig. 8 a front elevation of the standard supporting the deflection-pulley.

Similar letters indicate like parts throughout the several views.

Referring to the details of the drawings, A

indicates a support for the operating mechanism; A', a base uniting the parts of said operating mechanism; A², the cage-well; A³, the weight-pocket, and A⁴ a wall separating said well and pocket.

B indicates a shaft journaled in bearings b, supported by posts P on opposite sides of base A'. On an end of the shaft extended beyond one of the bearings b is keyed a driving-pulley B', around which passes the endless hand-rope B²; and on said shaft between the posts is keyed a pulley D, preferably of less diameter than the driving-pulley and having a cam, to be described, on one face thereof. Cam-pulley D is located over an opening a, leading through the support A and the base into the cage-well, and beneath one side of said cam-pulley is a smaller well-pulley E, journaled in posts e and the inner side of the periphery of which is in line with the center of opening a. A deflection-pulley F, journaled in posts f of a standard F', is located on the opposite side of the cam-pulley and has the inner side of its periphery in line with a vertical tangent to said cam-pulley. All these pulleys are grooved, the driving-pulley to receive the hand-rope B² and the pulleys D, E, and F to receive the hoisting-rope B³, which passes up through opening a to and over well-pulley E, thence to and around cam-pulley D, then to and beneath deflection-pulley F, and thence to and over pocket-pulley G, whence it extends down through opening a' into weight-pocket A³, a weight W in said pocket being attached to the hoisting-rope.

The weight-pocket may be located behind, by the side of, or in any other position relative to the cage-well; and the pocket-pulley G is always set in such position as to have the outer edge of its periphery over the opening a' into said pocket. It is therefore necessary that deflection-pulley F be adjustable to conform with the position of said pocket-pulley. With this end in view standard F' is constructed of the posts f, in which the deflection-pulley is journaled, a plate f', connecting the lower ends of said posts, and a threaded stem f², depending from the bottom of plate f'. This stem passes through a slot f³, formed in support A and base A' concen-

tric with a vertical tangent to the adjacent edge of the periphery of cam-pulley D, wherein it is adjustably secured by a nut f^4 .

Connected with the bottom of base A' , beneath the center of cam-pulley D, is a brake mechanism through which the hoisting-rope passes. This brake mechanism comprises a case H, having oppositely-located vertical grooves h in the inner faces of the end walls thereof, said end walls h' , adjacent to and on the inner side of grooves h , converging from the top toward the bottom of the case, friction-rollers h^2 between walls h' , a keeper-plate H' , engaging grooves h and having on the inner face thereof short horizontal ribs h^3 , that maintain friction-rollers h^2 in their proper relative positions, and an upright arm H^2 , secured to keeper-plate H' and through which the action of said keeper-plate and friction-rollers is regulated, as will be described. Rollers h^2 are retained opposite each other and moved vertically in the channel between said walls by ribs h^3 , as shown in Fig. 5, and hoisting-rope B^3 passes down through case H, between rollers h^2 , and is secured to the cage (not shown) below said case. In operating hoisting-rope B^3 passes freely down through the case so long as the keeper-plate is raised high enough to prevent friction-rollers h^2 from binding on said rope; but when the keeper-plate is allowed to drop the friction-rollers close upon the hoisting-rope and hold the same immovable, and by reason of the construction the greater the downward strain on the hoisting-rope the more securely is it held.

Upright arm H^2 has its upper end enlarged and a vertical slot h^4 formed therein that embraces shaft B, adjacent to cam-pulley D, the cam on the side of which is engaged by a stud h^5 , projecting from said arm below slot h^4 . This cam is formed by a polygonal rib, the sides K of which curve inward, whereby the angles K' of the same are formed into pockets or recesses, as illustrated in Figs. 1, 3, and 4.

As cam-pulley D is revolved the parts of the cam-rib pass, successively, beneath stud h^5 , and when said stud is in engagement with either of the sides K of the cam-rib and there is no tension on the hand-rope the load in the cage tends to revolve cam-pulley D until said stud slides into one of the pockets K' , thus lowering keeper-plate H' until friction-rollers h^2 grasp the hoisting-rope B^3 and arrest the descent of the cage; but when hand-rope B^2 is used to lower the cage the cam-pulley D revolves with such rapidity that stud h^5 leaves the curved approach to each pocket K' and is caught by the reverse slope succeeding such approach before it (stud h^5) has descended deep enough into the pocket to drop keeper-plate H' so low as to permit friction-rollers h^2 to bind on the hoisting-rope. In this movement each of said reverse slopes of pockets K' succeeds said curved approach of its pocket so rapidly that the drop of stud h^5 is but slight, resembling somewhat the drop of a pawl be-

tween the teeth of a ratchet-wheel. When stud h^5 is allowed to settle into one of the pockets K' , so that the friction-rollers may bind upon the hoisting-rope and prevent downward movement of the same, said hoisting-rope is again released from the friction-rollers by pulling on the hand-rope, whereby the cam-pulley is revolved and stud h^5 travels up the reverse slope of the pocket in which it rests and releases the grasp of the friction-rollers on the hoisting-rope. In practice the friction-rollers arrest the downward movement of the hoisting-rope before stud h^5 reaches the bottoms of the pockets, for it must be understood that said pockets have sufficient depth to permit the friction-rollers to firmly grasp the hoisting-rope before said stud has reached the limit of its downward movement.

Extending inward from the post P, adjoining arm H^2 of the keeper-plate, is a horizontal member P' , from which a post P^2 projects diagonally upward; and to post P^2 is fulcrumed a lever L, having one end, l , pivoted to said arm H^2 below stud h^5 , while to the other end, l' , is attached a rope L' , that passes down into the cage-well. When it is desired to run the cage down freely, arm H^2 of the keeper-plate is raised through rope L' and lever L.

I do not restrict myself to the details of construction herein shown and described, as it is obvious that many changes may be made therein without departing from the principle and scope of my invention.

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

1. The combination, in an elevator, of a brake comprising converging walls, friction-rollers movable between said walls, a device adapted to control the positions of the friction-rollers with reference to the converging walls, and means for actuating said device, and a rope passing between the friction-rollers and having its movement controlled by said brake, for the purpose specified.

2. The combination, in an elevator, of a case having oppositely-located grooves therein, converging walls in the case, friction-rollers between the walls, an adjustable keeper-plate engaging said grooves, ribs on the keeper-plate and embracing the friction-rollers, and a rope controlled by said friction-rollers and passing between the same, substantially as and for the purpose specified.

3. The combination, in an elevator, of a case, converging walls in the case, friction-rollers between the walls, a keeper-plate adjustable longitudinally of the channel between the walls and adapted to control the positions of said rollers with reference to the converging walls, an arm on the keeper-plate, a pulley, a connection between said arm and the pulley, whereby the keeper-plate is actuated, and a rope controlled by said friction-rollers and passing between the same.

4. The combination, in an elevator, of a

case having oppositely-located grooves therein, converging walls in the case, friction-rollers between the walls, an adjustable keeper-plate engaging said grooves, ribs on the
5 keeper-plate and embracing the friction-rollers, a shaft, a pulley on the shaft having a cam thereon, an arm on the keeper-plate, a connection between the arm and the cam, whereby the keeper-plate is actuated, and a
10 rope controlled by said friction-rollers and passing between the same.

5. The combination, in an elevator, of a case having oppositely-located grooves therein, converging walls back of the grooves, friction-rollers between the walls, an adjustable
15 keeper-plate engaging said grooves, ribs on the keeper-plate and embracing said friction-rollers, an arm on the keeper-plate and having a slot in the upper end thereof, a shaft passing through said slot, a pulley on the
20 shaft, a cam on the pulley and surrounding the shaft, a stud on said arm and adapted to engage said cam, and a rope controlled by said friction-rollers and passing between the
25 same, substantially as and for the purpose specified.

6. The combination, in an elevator, with a brake comprising converging walls, and fric-

tion-rollers movable between said walls, substantially as described, of a keeper-plate for
30 supporting said rollers, an arm secured to the keeper-plate and having a slot in the upper end thereof, a shaft passing through the slot, a pulley on the shaft, a cam on the pulley, a
35 stud on said arm and engaging said cam, and means for disengaging the stud from the cam, for the purpose specified.

7. The combination, in an elevator, with a brake comprising converging walls, and friction-rollers movable between said walls, substantially as described, of a keeper-plate for
40 supporting said rollers, an arm secured to the keeper-plate and having a slot in the upper end thereof, a shaft passing through the slot, a pulley on the shaft, a cam on the pulley, a
45 stud on said arm and engaging said cam, a post, and a lever fulcrumed on said post and pivotally connected with said arm, whereby said arm is raised to disengage the stud from
50 the cam, substantially as and for the purpose specified.

MATHIAS C. SIGMUND.

Witnesses:

JOHN H. BOWERS,
WM. F. SCHLEMM.