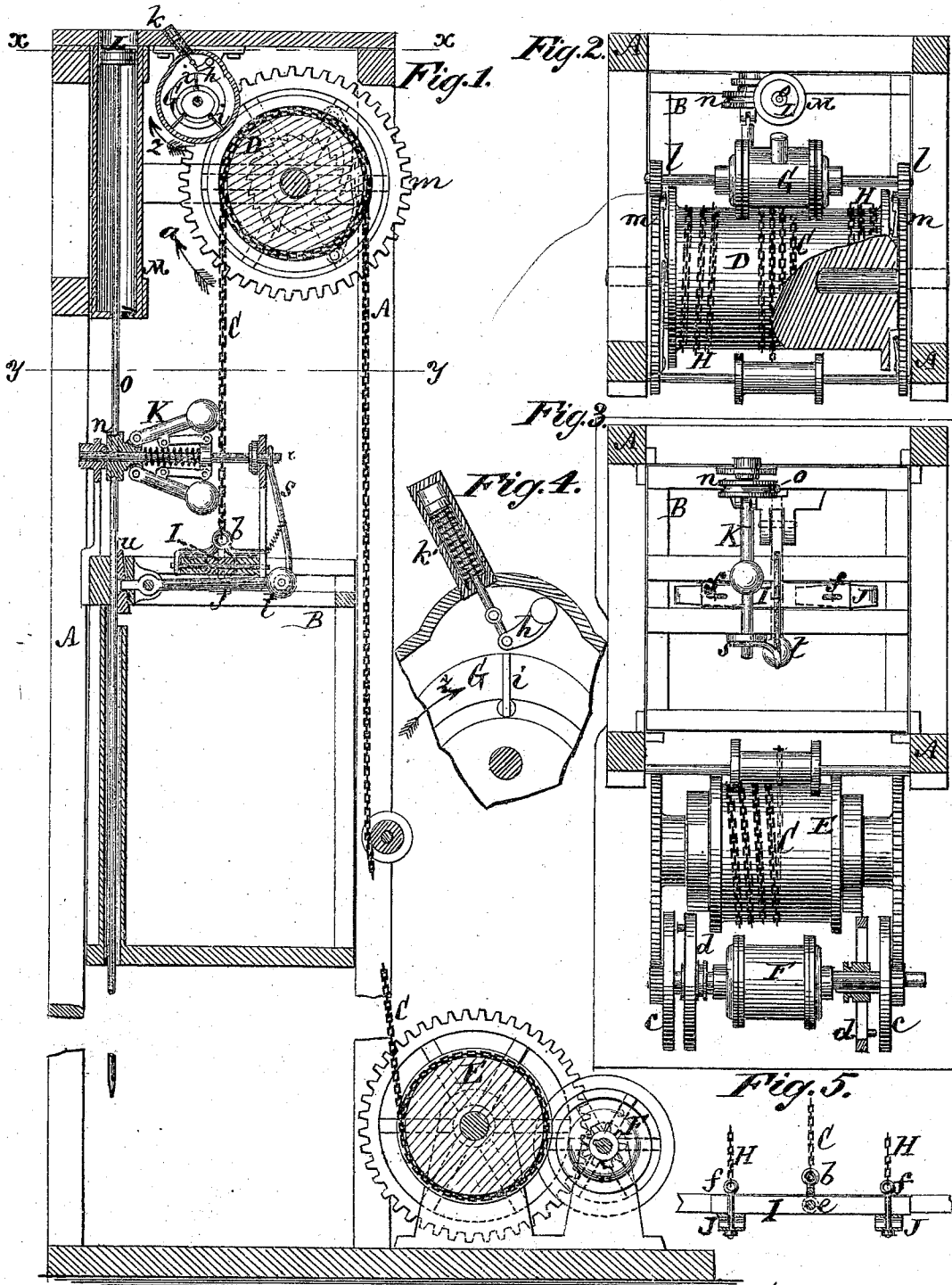


G. B. MASSEY.
Hoisting Apparatus.

No. 143,518.

Patented Oct. 7, 1873.



Witnesses
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UNITED STATES PATENT OFFICE.

GIDEON B. MASSEY, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND
ALFRED B. DARLING, OF SAME PLACE.

IMPROVEMENT IN HOISTING APPARATUS.

Specification forming part of Letters Patent No. 143,518, dated October 7, 1873; application filed
July 19, 1873.

To all whom it may concern:

Be it known that I, GIDEON B. MASSEY, of the city, county, and State of New York, have invented certain Improvements in Hoisting Apparatus, of which the following is a specification:

This invention consists, generally, in a novel application of a rotary fluid retarder to a hoisting apparatus, for controlling the descent of the car or platform by gravity, without interfering with its ascent, by a lifting chain or rope worked by the engine, which latter, although it might be a special one for the purpose, may be an engine also used for other purposes, and not requiring to be reversed when it is necessary to lower the hoisting car or platform. By using a rotary retarder, that irregularity of motion which is incidental to a reciprocating retarder throughout its stroke is avoided, and a more prompt and certain action obtained. The invention also consists in a combination of a piston and cylinder, operating as an air or fluid stop, and a governor moving up and down with the car or platform, and actuated by contact or gear with a rod, rack, or bar attached to the piston, for arresting the motion of the car or platform in case of its too sudden descent from any cause or accident whatever. The invention also comprises various other combinations and arrangements for insuring the proper operation of said parts and safety of the apparatus as a whole.

In the accompanying drawing, Figure 1 represents a vertical section of a hoisting apparatus having my invention applied; Fig. 2, a sectional plan on the line *x x*; Fig. 3, a horizontal section on the line *y y*; Fig. 4, a sectional view, in part, of a rotary retarder, arranged to operate in concert with the upper or safety drum of the apparatus; and Fig. 5, a view, in detail, showing the attachment of the safety and lifting ropes or chains with the car or platform.

Similar letters of reference indicate corresponding parts.

A A are the uprights of the hoistway, and B the traveling car or platform, to which the lifting rope or chain C has a positive attachment at *b*, and from which it passes up to and has several bights around an upper or safety

drum, D, from whence it passes to the hoisting-drum E below. F is a Massey rotary or any other suitable engine, which, when specially used to drive the hoisting-drum, may be constructed to draw in air when the car B is being lowered, for the purpose of making it act as a retarder to check the too rapid descent of the car; but it is proposed to use a special retarder, G, for such purpose, as hereinafter more fully described, and so that the engine F may be used for other purposes besides operating the hoisting-drum to effect lift of the car B, such engine not requiring to be reversed when the car B, which descends by gravity under control of the retarder, is to be reversed, but simply being disconnected from driving attachment with the hoisting-drum by fast and loose clutches *c d* on the engine-shaft, or by any other suitable means. In this way, the same engine may be used for various purposes without stopping or reversing it to operate the hoisting apparatus. Fastened to the same drum, D, as the lifting-chain C passes with bight around, are safety-chains H H. These chains, unlike the hoisting rope or chain C, which is rigidly or positively attached to the car B, are connected with the car by or through the intervention of a rocking beam or lever, I, which is hung on an intermediate pivot, *e*, to the top of the car, and the safety-chains H attached at *f f* to opposite ends of the beam. Said chains H, although moving up and down in common with and at the same velocity as the lifting-chain C, and kept sufficiently taut to prevent entanglement and be ready for action when required, exert no lifting action, and are subjected to no strain in the ordinary working of the apparatus; but, in case of any accident to or irregularity in the lifting-chain, then the safety-chains H H sustain the car; but the strain on them is only produced gradually, and any irregularity in strain on them is prevented by means of springs J J interposed between the ends of the beam I and top of the car, thus giving an elastic connection to the safety-chains H, while the hoisting-chain C has a rigid or positive one. As before observed, the car or platform B descends by gravity, subject to control by a retarder, G. This retarder may also be constructed upon

the same general principles as a Massey rotary engine, but with its pivoted abutment *h* arranged to occupy a tangential or oblique relation to the circular travel of the pistons *i*, and controlled by a rod and spring, *k*, the tension of which latter should be adjustable to suit different resistances or velocities required.

I do not, however, restrict myself to this particular construction of rotary retarder, the object of which is to yield, or offer little or no resistance, when the drum *D* is being revolved by the lifting-chain *C* to effect the hoist, but which shall have a retarding effect on said drum when the latter is revolving in a reverse direction and the car *B* is being lowered by gravity. To this end the rotary retarder *G* is geared to revolve with the drum *D* by means of pinions *l* and wheels *m*, the latter preferably being connected with the drum-shaft by pawl and ratchet, subject to the control of a spring, so that when the car *B* is ascending and the drum *D* rotating, as indicated by the arrow *a*, said drum may slip from driving the wheels *m*, and, through them, the retarder *G*, which then is not required to exert any influence. The retarder *G* is filled with oil or any other suitable fluid, and when driven by the drum *D* through the pinions *l* and wheels *m*, so that its pistons *i* travel in direction of the arrow *z*, which is when the car *B* is descending, the force of the current within the retarder is projected to more or less close (according to the velocity) the abutment *h*. In proportion to the quantity of fluid permitted to pass the abutment will the speed of the descending car be determined. On the other hand, when the retarder *G* is not revolved by reason of the slipping of the drum *D* relatively with the wheels *m* as the car is being raised, then the spring *k* will operate to open or lift the abutment *h*; or any tendency of the drum to drive the retarder will cause the current therein to similarly act upon the abutment, and thus give free scope or run for the fluid, and so prevent the retarder from offering any resistance or checking the ascent of the car. Thus the retarder may only be in operation when the car is being lowered by gravity to control the descent thereof, the speed of descent being controlled by the tension of the spring *k*. It is in affording such provision for controlling the descent that the superiority of the rotary retarder over the reciprocating retarder consists.

K is a governor carried by the car *B*, and actuated, as the latter travels up and down, by dead contact or friction of a wheel or pulley, *n*, with a rod, *o*, attached to a piston, *L*, which latter works in a cylinder, *M*, that is closed below, but open above. This cylinder *M* may be provided in its bottom with a valve for the admission of air, to form a cushion below the pis-

ton when required, to stop the descent of the car when required, as will be hereinafter described. This valve may be dispensed with by making the piston fit somewhat loosely to the cylinder, so that the air could only escape very slowly from below the piston during its descent to stop the car *B*, when required, as herein-after described.

Instead of the governor being operated by friction, as described, a pinion may be substituted for the wheel *n*, and the rod or bar *o* be constructed to form a rack for said pinion to gear with. This rod, rack, or bar is free to move up and down with the piston. In the ordinary run up and down of the car *B* the piston *L* remains stationary, the wheel *n* simply traveling over the surface of the rod *o*. In case, however, of breakage, or any suddenly-accelerated velocity of the governor due to a too rapid descent of the car *B*, the governor-spindle *r* is drawn inward or released from hold on a spring-borne catch, *s*, which, letting free a weighted lever, *t*, forces a wedge, *u*, against the rod *o*, and locks the latter with the car *B*, so that the piston *L* is drawn down with the car, and, compressing the air in the cylinder *M*, gradually arrests the car in its descent.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination of a rotary incased fluid retarder, *G*, with the car or platform *B*, arranged to descend by gravity, and hoisting mechanism operated by the engine, substantially as specified.

2. In a rotary retarder applied to a hoisting apparatus, an abutment controlled by a spring, substantially as herein described.

3. The rotary fluid retarder *G* with its swinging abutment *h* and spring *k*, arranged for operation as described, in combination with the drum *D*, the lifting rope or chain *C*, the car or platform *B*, and the hoisting-drum *E*, operated by the engine during its travel in one direction only, substantially as specified.

4. The combination, with the drum *D* and lifting rope or chain *C*, positively or inelastically connected to the platform *B*, of the safety ropes or chains *H*, the rocking beam *I*, and the springs *J J*, essentially as and for the purposes herein set forth.

5. The piston and cylinder fluid stop *L M*, in combination with a governor, *K*, carried by the car, and mechanism, substantially as described, for actuating the governor, and causing it, when moving at an undue velocity, to couple the piston *L* with the car, essentially as and for the purpose herein set forth.

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Witnesses:

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