

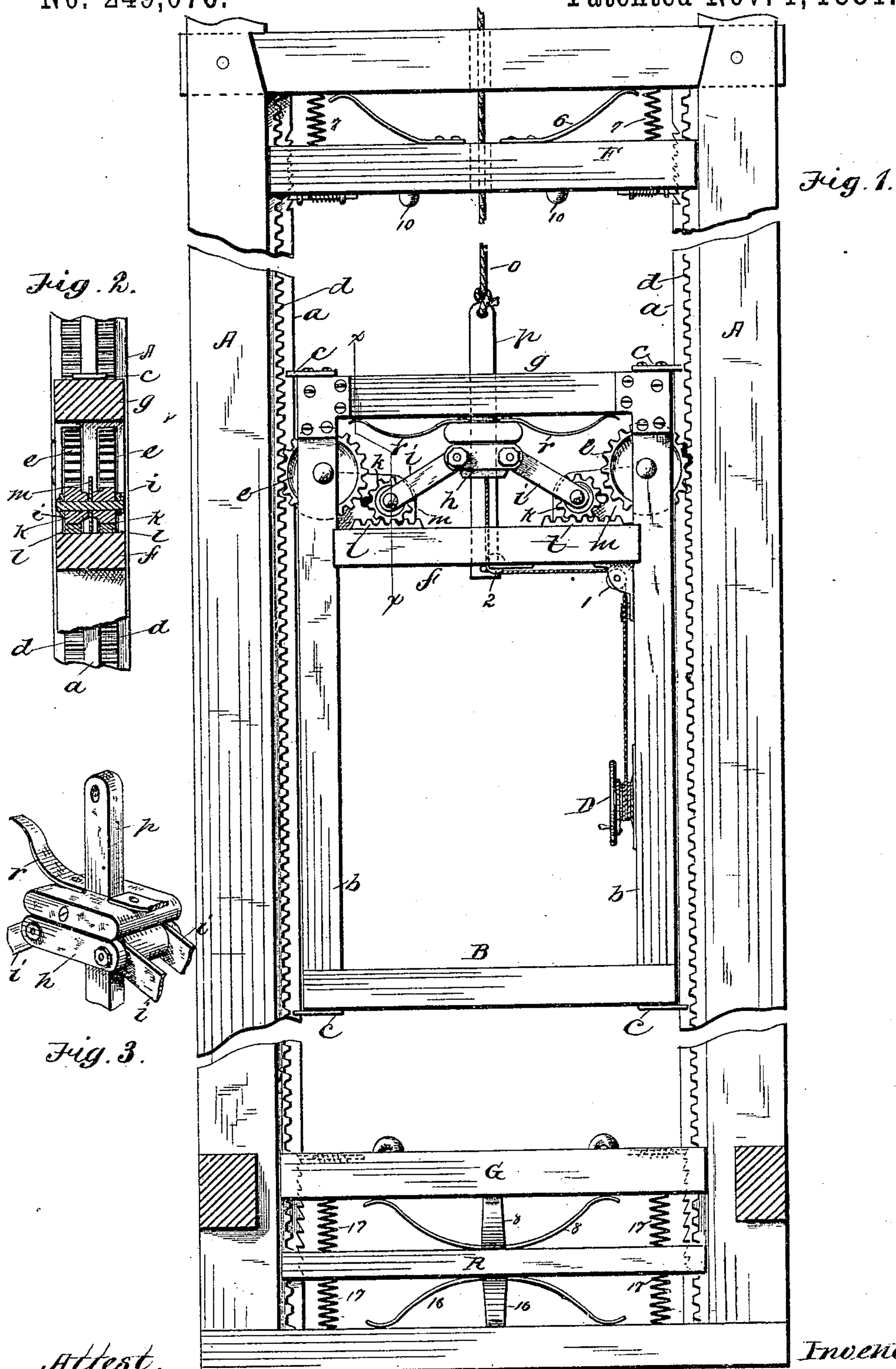
(No Model.)

2 Sheets—Sheet 1.

D. MOULTON.
ELEVATOR STOP.

No. 249,076.

Patented Nov. 1, 1881.



Attest,
W. N. H. Knight
F. L. Middleton

Inventor,
David Moulton
By Eliza Spear
Attorney

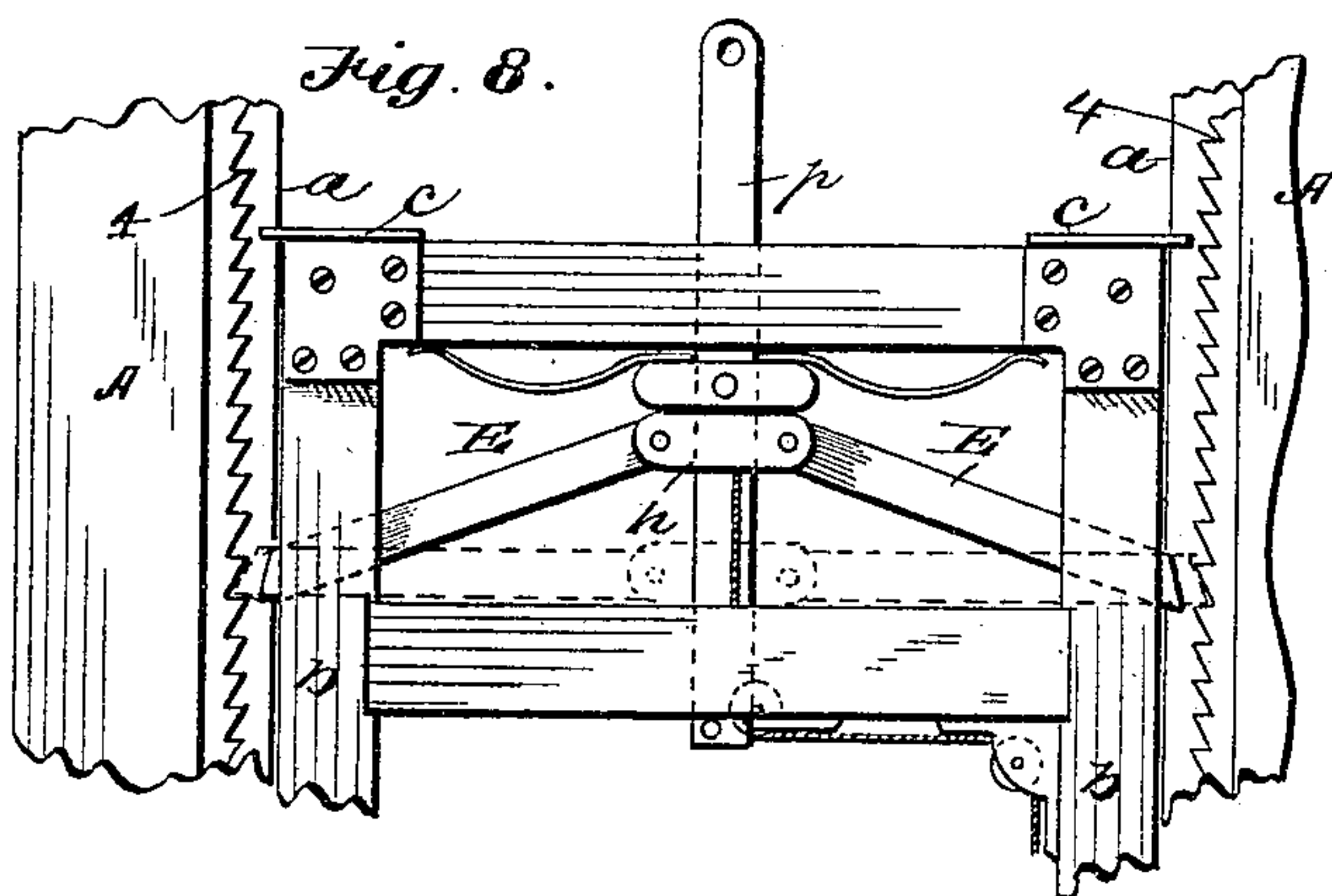
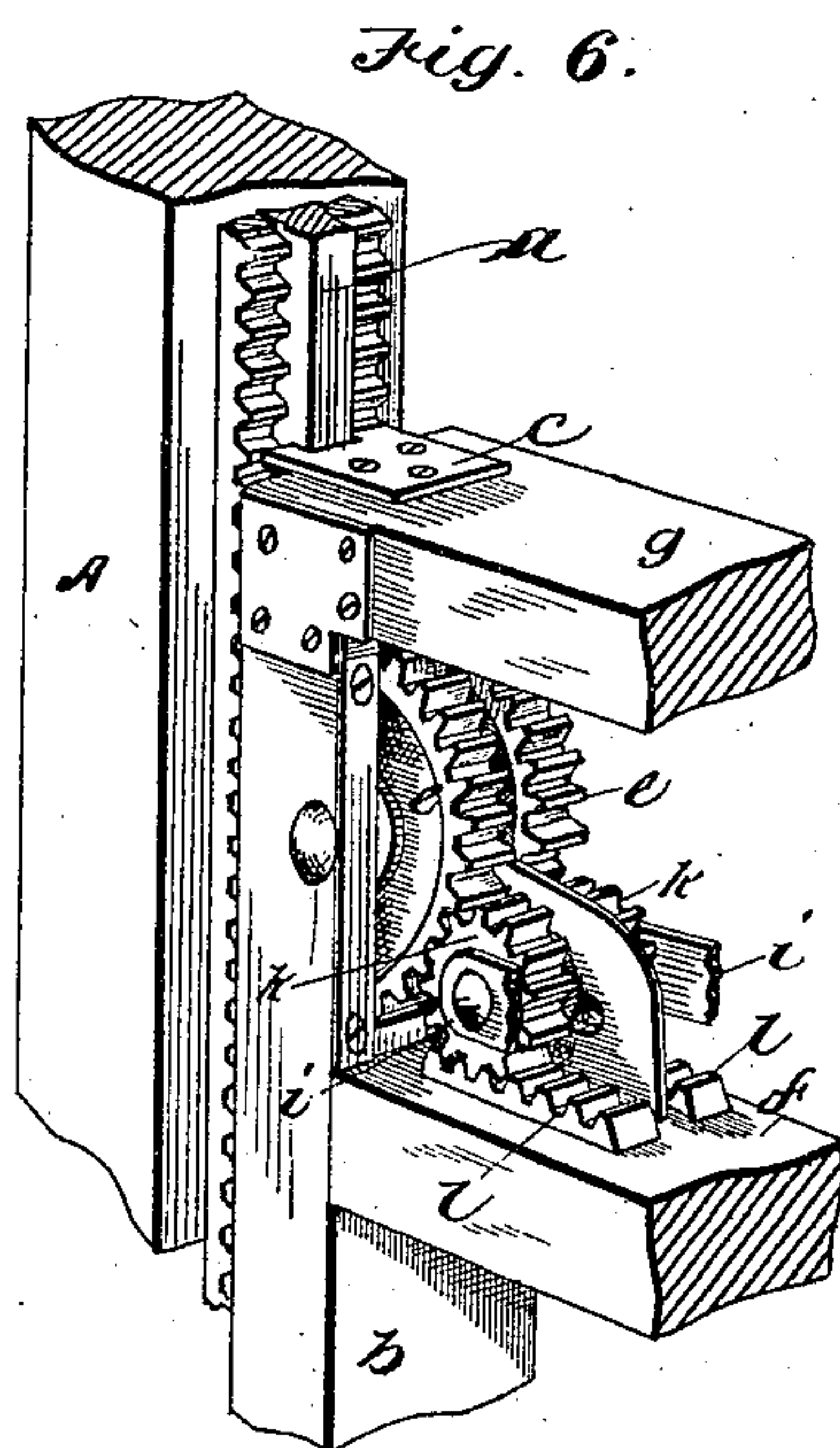
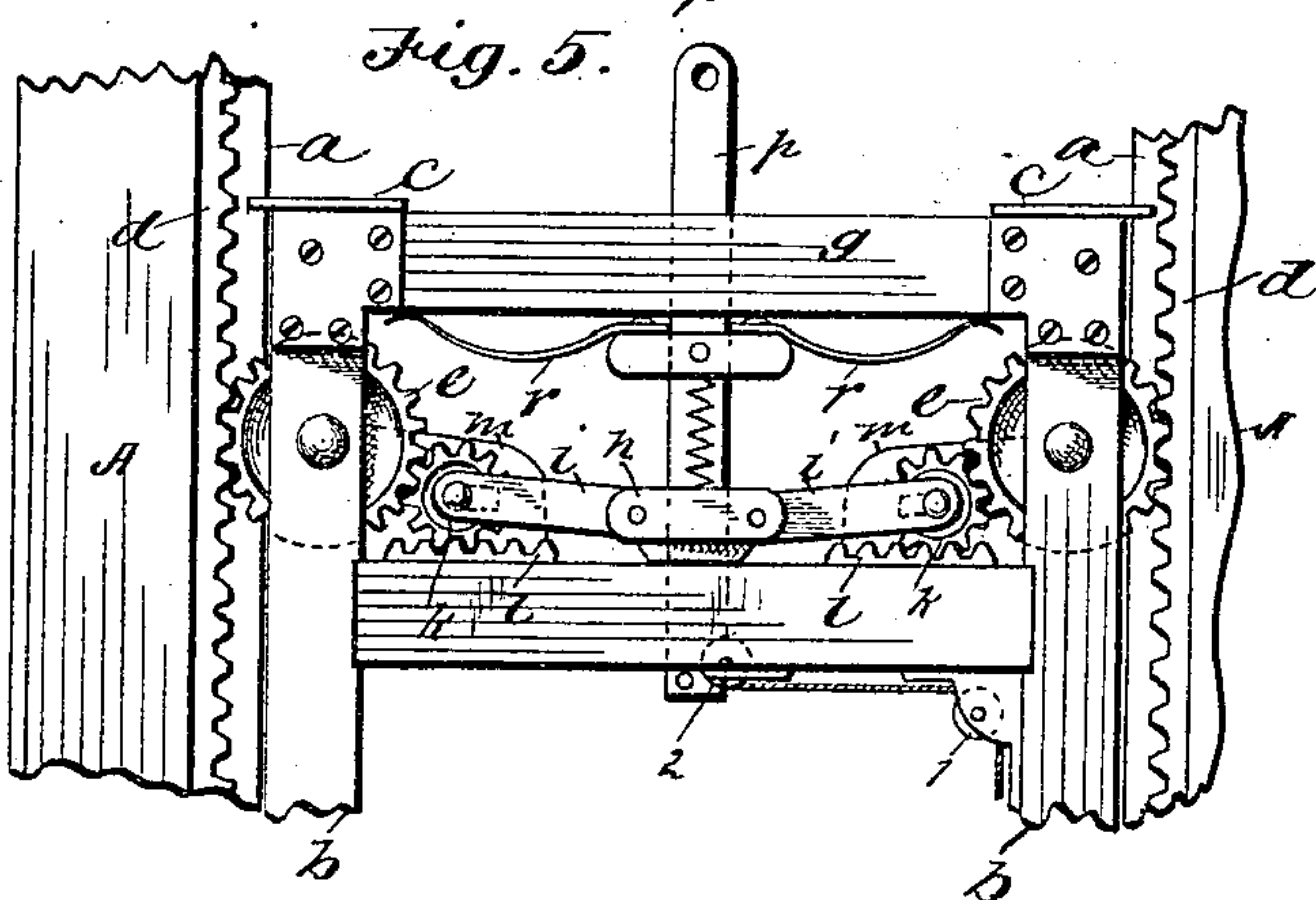
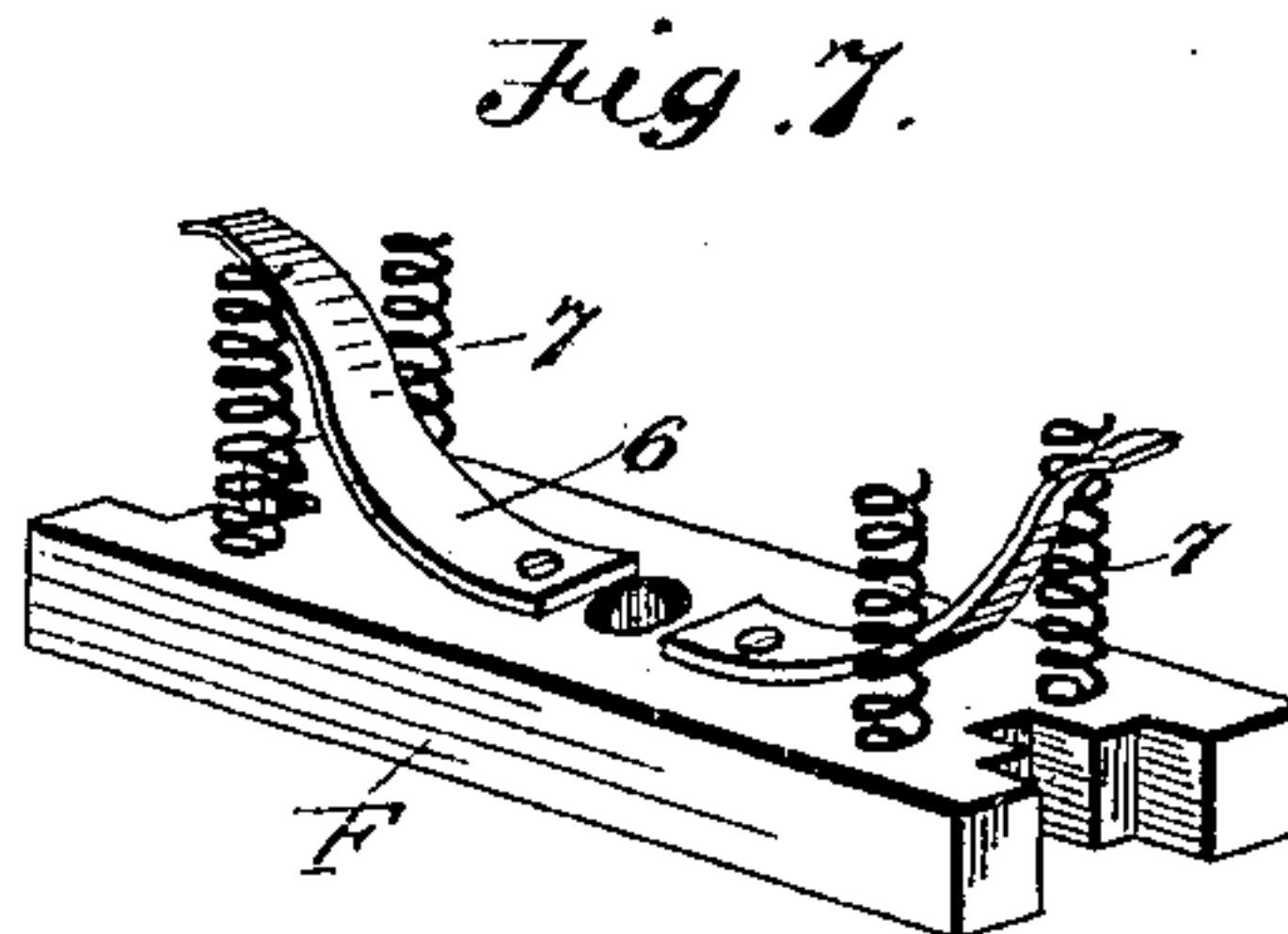
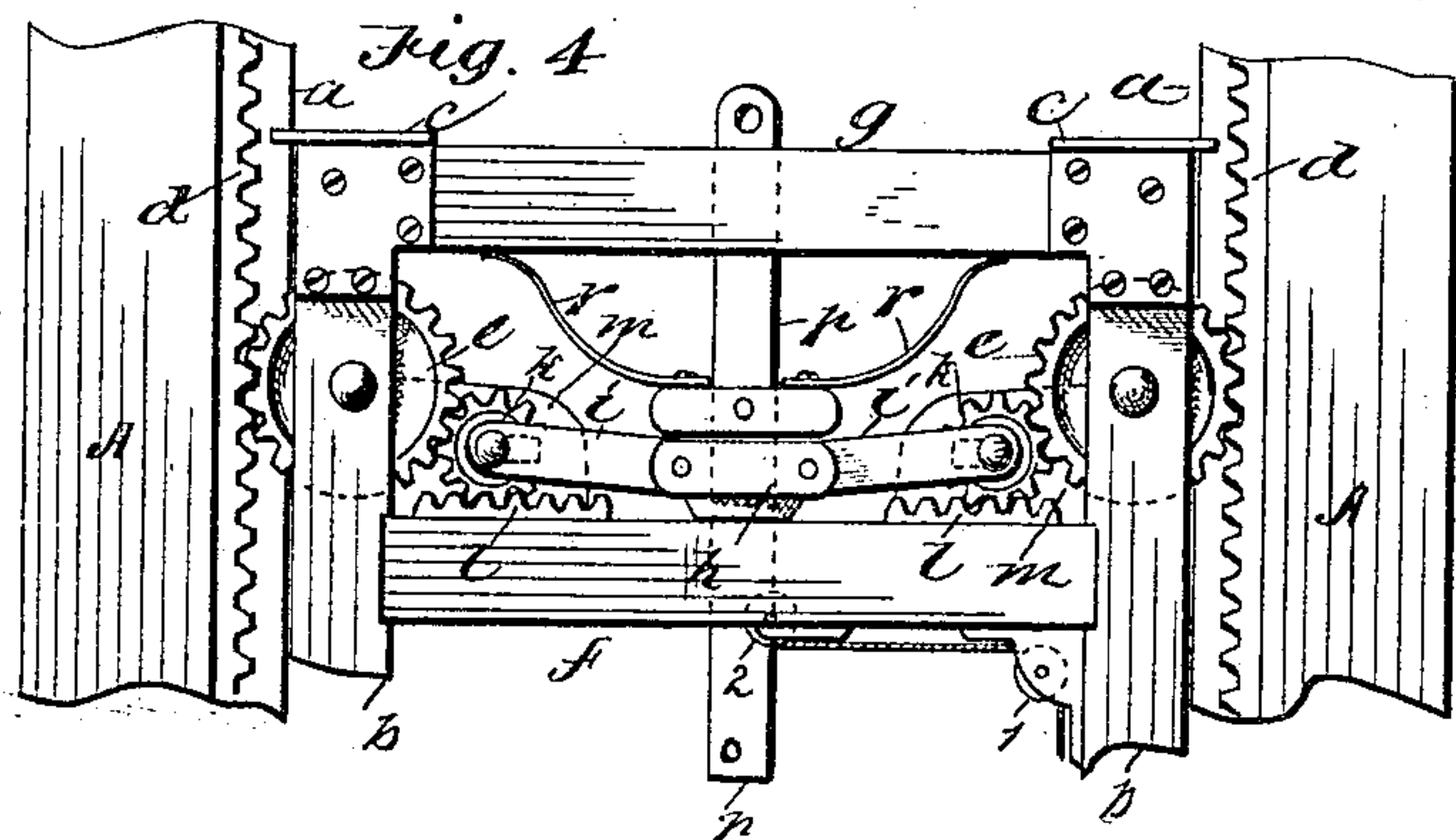
(No Model.)

2 Sheets—Sheet 2.

D. MOULTON.
ELEVATOR STOP.

No. 249,076.

Patented Nov. 1, 1881.



Attest,
W. N. H. Knight
F. L. Middleton

Inventor,
David Moulton
By Ellis Spear
Attorney

UNITED STATES PATENT OFFICE.

DAVID MOULTON, OF BOSTON, MASSACHUSETTS.

ELEVATOR-STOP.

SPECIFICATION forming part of Letters Patent No. 249,076, dated November 1, 1881.

Application filed September 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, DAVID MOULTON, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Elevator-Stops; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to passenger-elevator cars, factory and warehouse hoists, and like apparatus in which a platform, car, or cage carrying passengers or goods is raised or lowered.

It consists, principally, of an improved safety stop or arresting device for arresting the car, platform, or cage automatically and instantly upon the breaking of the hoisting-rope, or at the will of the attendant or conductor at any point upon derangement of any of the hoisting machinery, slipping of the belt, or the like. This arresting device is designed to be used independently of the ordinary arresting devices by means of which the car or platform is stopped in the common working of the apparatus.

My invention further consists of yielding platforms or buffer devices at the top and bottom of the ways, by means of which the car or platform, when by any accident it is run too far in either direction, is arrested without shock.

These improvements are hereinafter described in connection with an ordinary elevator-platform, and the whole is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation; Fig. 2, a section on line *x x* of Fig. 1; Fig. 3, a perspective view of a portion of rod *p* and plates *h* detached. Figs. 4, 5, and 6, are detached views of stop mechanisms; Fig. 7, a detail view, and Fig. 8 a modification, of stop mechanism.

In these drawings, *A A* represent the side posts of ordinary frame-work, on which are the guide-rails *a a* for the cage, platform, or box, on or within which the persons or goods are raised or lowered. As shown, this part consists of an ordinary platform, *B*, and this may suitably represent its class. It is provided with upright pieces or standards *b b*, which represent also the sides of a car, and have guide-flanges *c c* above and below embracing

the guide-rail and holding and directing the platform or car. Preferably on each side of the guide-rail of each post is a rack-bar, *d*, extending from top to bottom, and in the upper part of each standard of the platform or car are pinions *e e*, turning freely in slots in said standards and engaging with the rack-bars. I prefer to have two pinions on each side of the cage or platform—one on each side of the guide-rail. This gives an equal bearing, though one on each side of the cage or platform might serve the purpose. Ordinarily, as the platform rises or descends, these pinions move as idle-wheels, or serving no purpose, except as additional guides for the platform and frame. The principal devices of this form of my invention are used in connection with these pinions.

The great danger in the use of hoists and elevators of the class hereinbefore referred to is in the breaking of the hoisting-rope, or in the machinery of the hoist becoming unmanageable. To guard against any danger from these sources I have provided means for arresting the motion of these wheels and that of the whole cage by the breaking of the rope or by the act of the attendant on the platform. The upright pieces or top of the car are provided with two cross-beams, *f* and *g*. Between these two beams is a central block or plate, *h*, connected on each side by bars *i i*, pivoted to small pinions *k k*, which run on short rack-bars *l l*, fixed to the lower beam near the pinions *e e*. There are two sets of these bars, one on each side, and two sets of small pinions running on the short racks. Each pair of the pinions is connected by a pin or axle, which passes through a slotted vertical plate, *m*, fixed to the lower beam between the pinions. This keeps the pinions down in place. The central block and the bars pivoted thereto and to the small pinions act as toggles. When the block is down the length of the bars is so adjusted that the small pinions are forced out on the short racks, so as to engage with the large pinions *e e*, while they remain also in gear with the short racks. This arrests the motion of the pinions *e e*, and thereby the motion of the whole platform or car. When, however, the central block is raised the small pinions are drawn out of gear with the larger, and the platform is left free to

move. The motion of this central block is regulated by the rope which raises the platform, and which may be connected either directly or indirectly to this block. In the form shown, however, the rope *o* is connected to a metal bar, *p*, which extends through both upper and lower cross-beams, sliding freely in holes in said beams. This bar passes also through an upper block, *q*, and through the lower block heretofore specified. It is connected to the upper by a pin, and the upper block is attached to the lower by elastic connection for reasons hereinafter explained. The weight of the block is intended to be sufficient to force the pinions into gear, but springs *r r*, resting against the under side of the upper beam or top of car, are fixed to the upper block, so as to tend always to force the blocks down. The rope being attached to the upper end of the bar *p*, when force is applied to said rope its first effect is to raise the blocks and draw the small pinions out of gear with the larger. As the blocks then come into contact with the upper bearing or beam, further motion of the rope raises the platform or car, which has been unlocked by the first movement. On the other hand, supposing the platform to be descending and the rope to break, the springs *9*, between the block and upper bearing, are then free to act and throw down said blocks, thus forcing the small pinions into gear with the large and arresting the car or platform at whatever point the breakage occurs. The parts are so arranged that the blocks and small pinions are then in line and the whole jointed structure is on a dead-center.

It sometimes happens that the motive power becomes unmanagable, and it is desirable that the elevator car or platform should be arrested at the will of the attendant or conductor. For this purpose I provide a small hand-wheel, *D*, and drum on the inside of the car or post of the platform, with a rope or chain running over pulleys 1 and 2 to the block, by means of which hand-wheel, drum, and rope or chain the block may at any time be brought down and the car or platform arrested. In order to permit this action while the hoisting-rope is sustaining the weight of the car, I have provided the two blocks and connecting-spring heretofore referred to. As the lower block, to which the locking mechanisms are connected, is connected to the upper by a yielding connection, it may be drawn down without difficulty and without moving the upper. Any suitable spring may be used of sufficient strength to operate the locking devices. The hand-wheel is provided with suitable pawl and ratchet. The hoisting-rope is carried over pulleys and around a drum in any of the well-known ways.

In Fig. 8 I have shown a modification of the arresting devices, consisting of a pair of iron bars or pawls, hinged to each side of the central block instead of the small pinions. These bars are cut sloping on their ends, with the lower edge fitted to catch into teeth 4 of the

ratchet used, instead of the ordinary cogs of the rack-bar. These bars (marked *E*) project through mortises in the vertical posts, and when in engagement with the ratchet hold the platform securely in place. They are operated by the central block, to which they are pivoted in the same manner as the small pinions and their connecting-bars, heretofore described.

In order to relieve the shock experienced when the platform or car by any accident reaches and comes into contact with the top or bottom, I have provided spring-platforms. That at the top is shown at *F*. It consists of a simple cross-bar moving on the guide-rail, and having bow or coiled springs 6 and 7 interposed between it and the top. Buffers of rubber, 10, for further ease and security, are placed on the lower surface of the bar.

The lower buffering apparatus is shown in Fig. 1. This consists of a double platform. The upper (marked *G*) rests upon two bow-springs, 8 8, placed at right angles to each other, and bolted at their crossing to an intermediate platform, *R*, which, in turn, rests on like springs, 16 16, which rest upon the floor. Coiled springs 17 are also placed at the corners to give increased resilience. In order to prevent the rebound which this spring-platform would give the car, I have added spring-catches, one on each side, engaging with inclined teeth which may be cut in the edge of the guide-rail. The effect of these catches is to lock the platform down, when depressed, and to hold it until released by the withdrawal of the spring-catches, which may be of any convenient construction.

The special mode of applying my improvements to a car, cage, or platform may be varied without departing from the spirit of my invention. When attached to a passenger-elevator car the locking devices may be located above the ceiling and out of sight.

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

1. In combination with an elevator car or platform, the described safety-stop mechanism, consisting of a central block connected to the hoisting-rope and clutch mechanisms operating in connection with racks on the frame, said block and clutch mechanisms being adapted to arrest the car or platform upon breakage of the rope, substantially as described.

2. The combination of the central block connected to the rope by which the car or platform is raised or lowered, the pinions connected thereto by pivoted bars and moving on short racks, the pinions pivoted in the sides of the frame, and the racks in the posts in which the said platform or car slides, the parts being arranged to cause the engagement of the pinions and arrest the car or platform, as set forth.

3. The combination of the central blocks, the upper being connected to the rope and to the lower block by a spring, the clutch mech-

anisms pivoted to said lower block, and operated by the fall of the block to arrest the car or platform, and the hand-wheel, drum, and cord, whereby the lower block may be drawn
5 down and clutches engaged at will of the operator, as set forth.

4. The combination, with the car or platform, of the pinions *ee*, pivoted in the sides, and adapted to engage with racks on each side of
10 the guide-rail, and pinions *kk*, running on short racks fixed to the beam of the car or platform, and connected to each other by a pin or bolt forming the axis of both and passing through
15 the slotted plate *m*, said pinions *kk* being connected to a central block and operating substantially as described.

5. The upper buffing device consisting of a cross-beam or bar moving on the guide-rail, and provided with springs, as set forth.

6. The lower buffing apparatus consisting 20 of the platform or platforms provided with springs, as described, and with spring-catches acting in connection with teeth on the side of the frame, substantially as described.

In testimony whereof I have signed my name 25 to this specification in the presence of two subscribing witnesses.

DAVID MOULTON.

Witnesses:

F. L. MIDDLETON,
WALTER DONALDSON.