

(No Model.)

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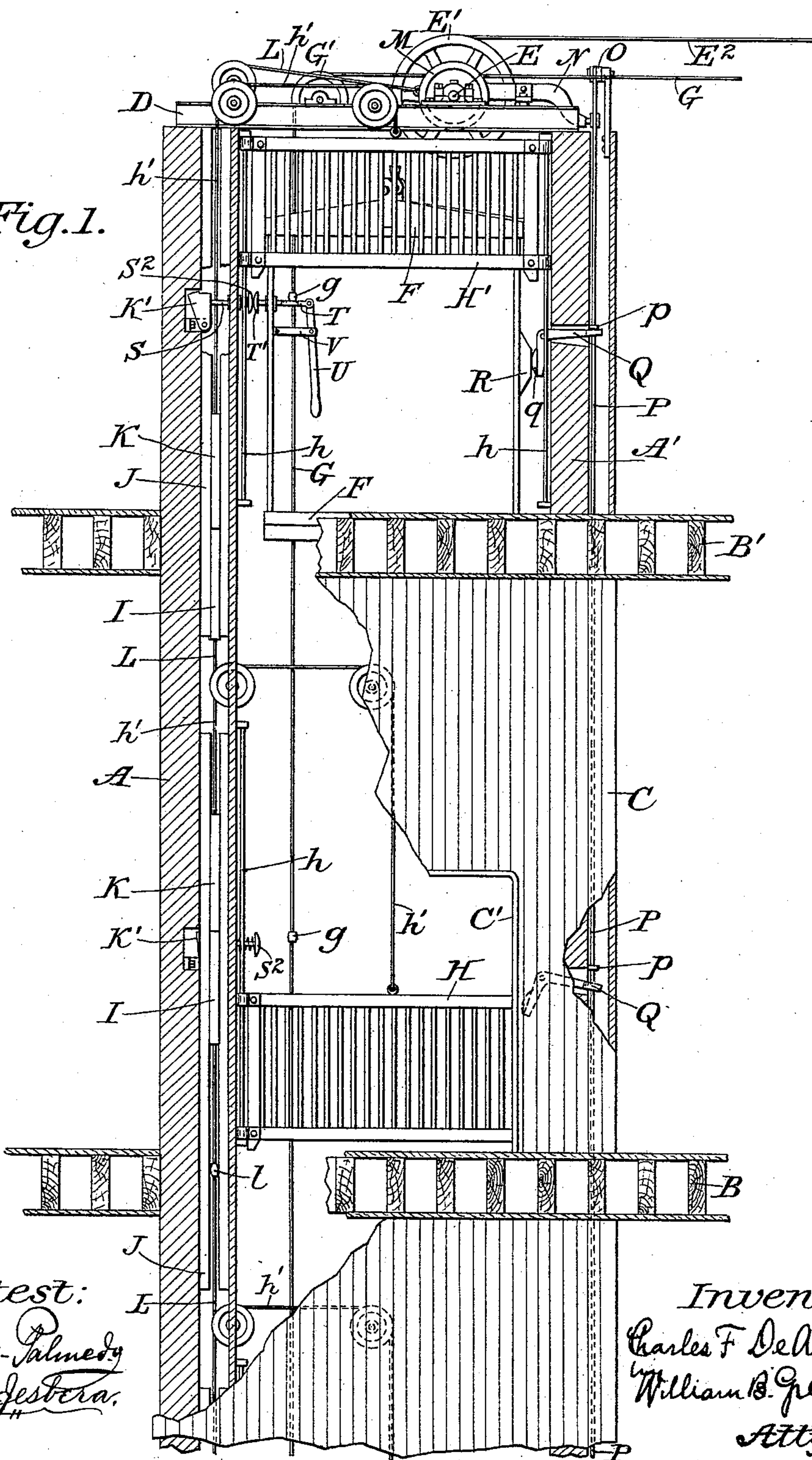
C. F. DE ARDEN.

DEVICE FOR OPERATING GATES FOR ELEVATOR WELLS.

No. 529,161.

Patented Nov. 13, 1894.

Fig. 1.



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(No Model.)

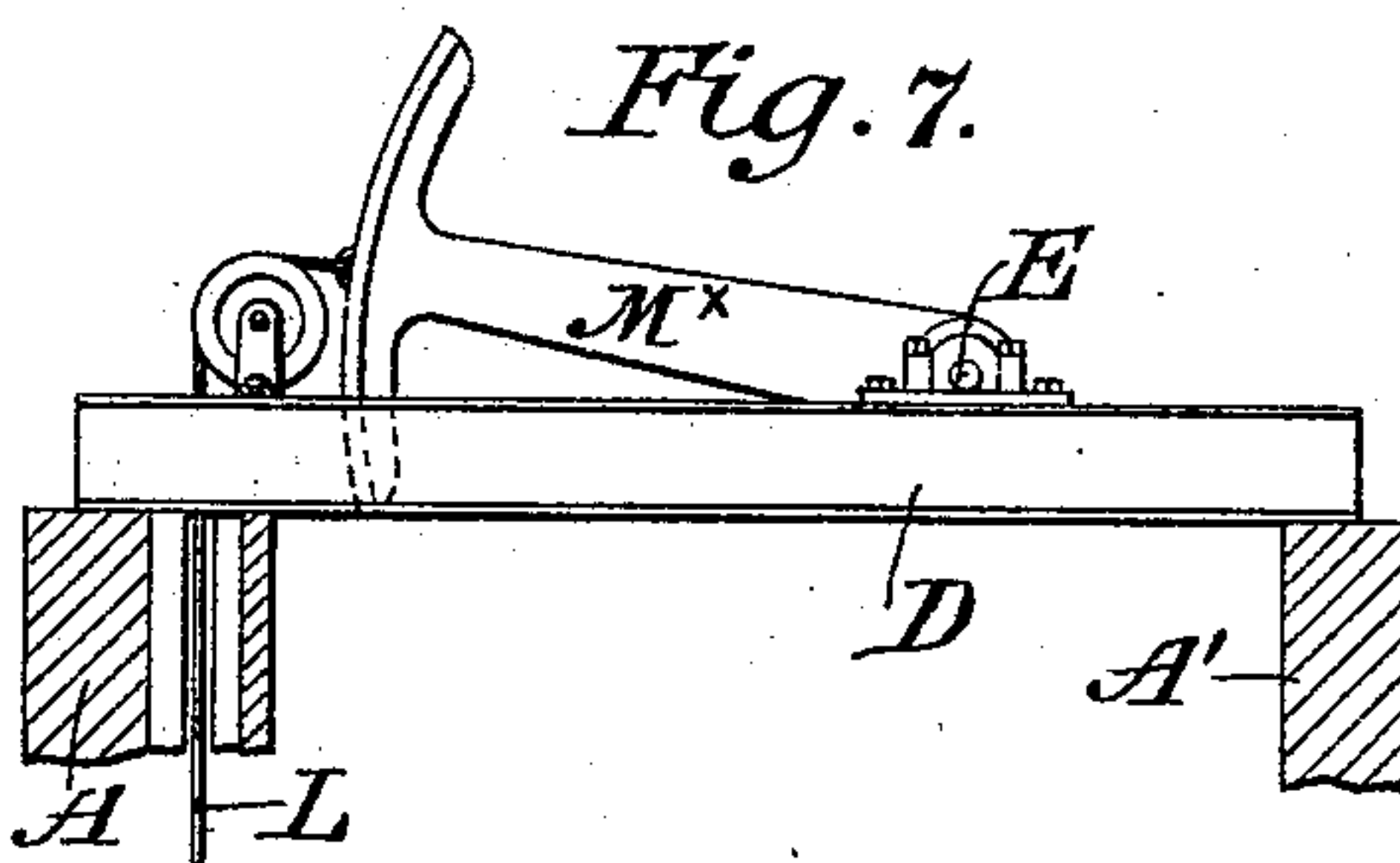
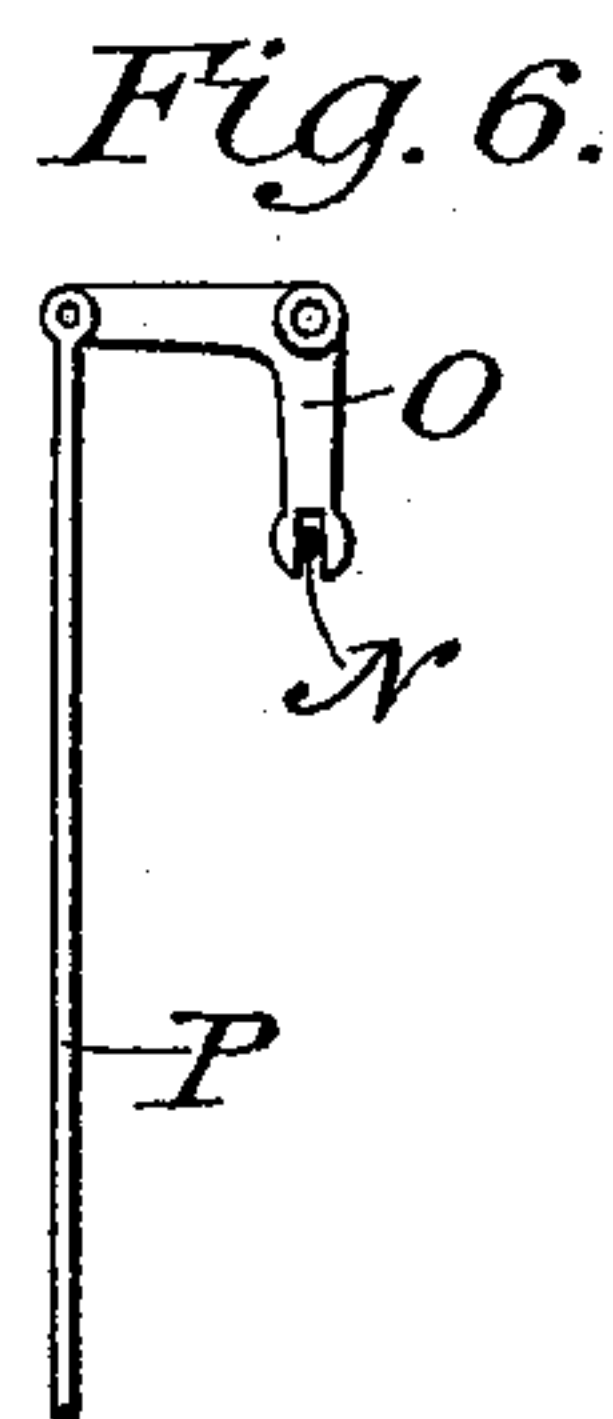
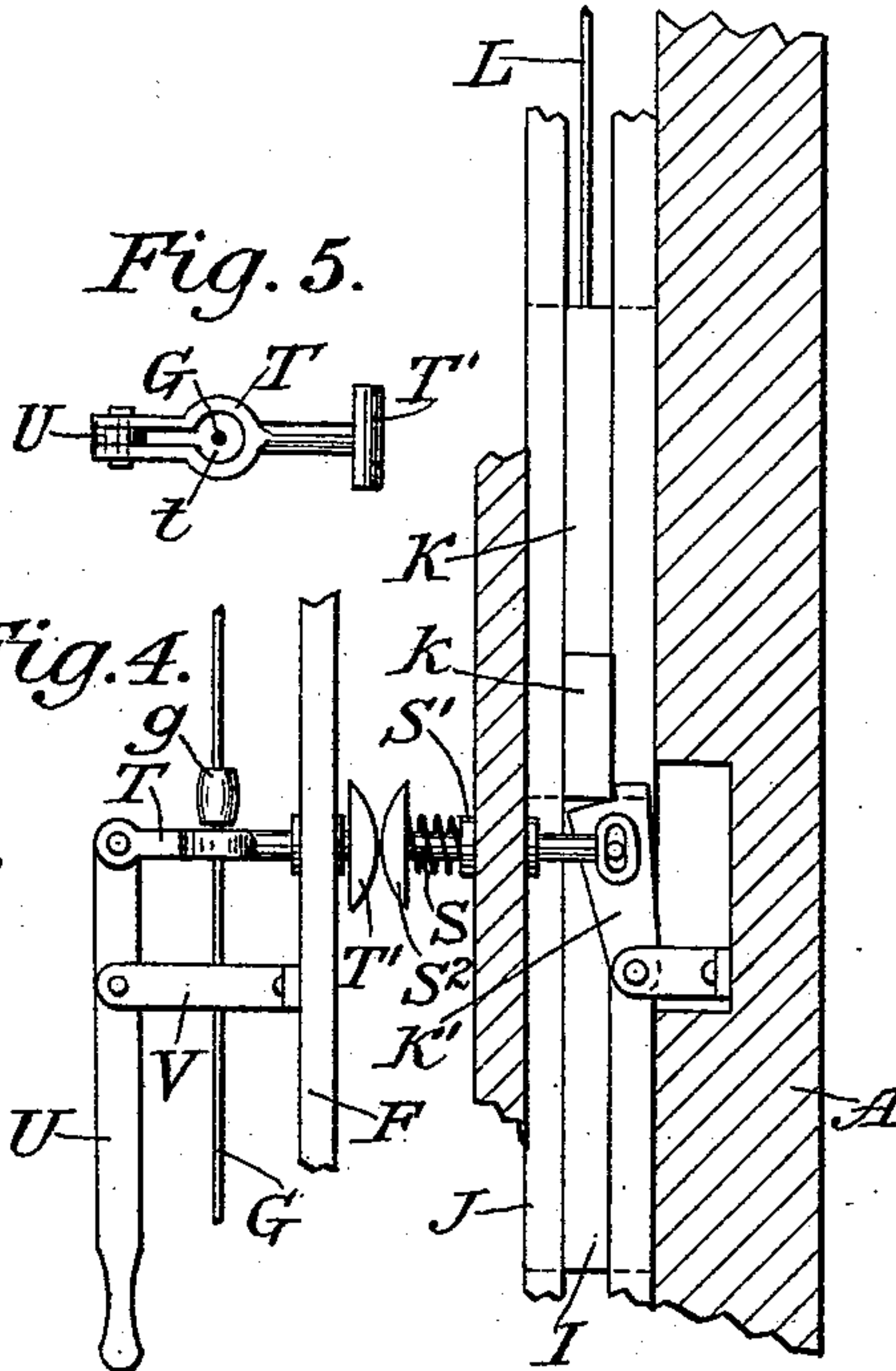
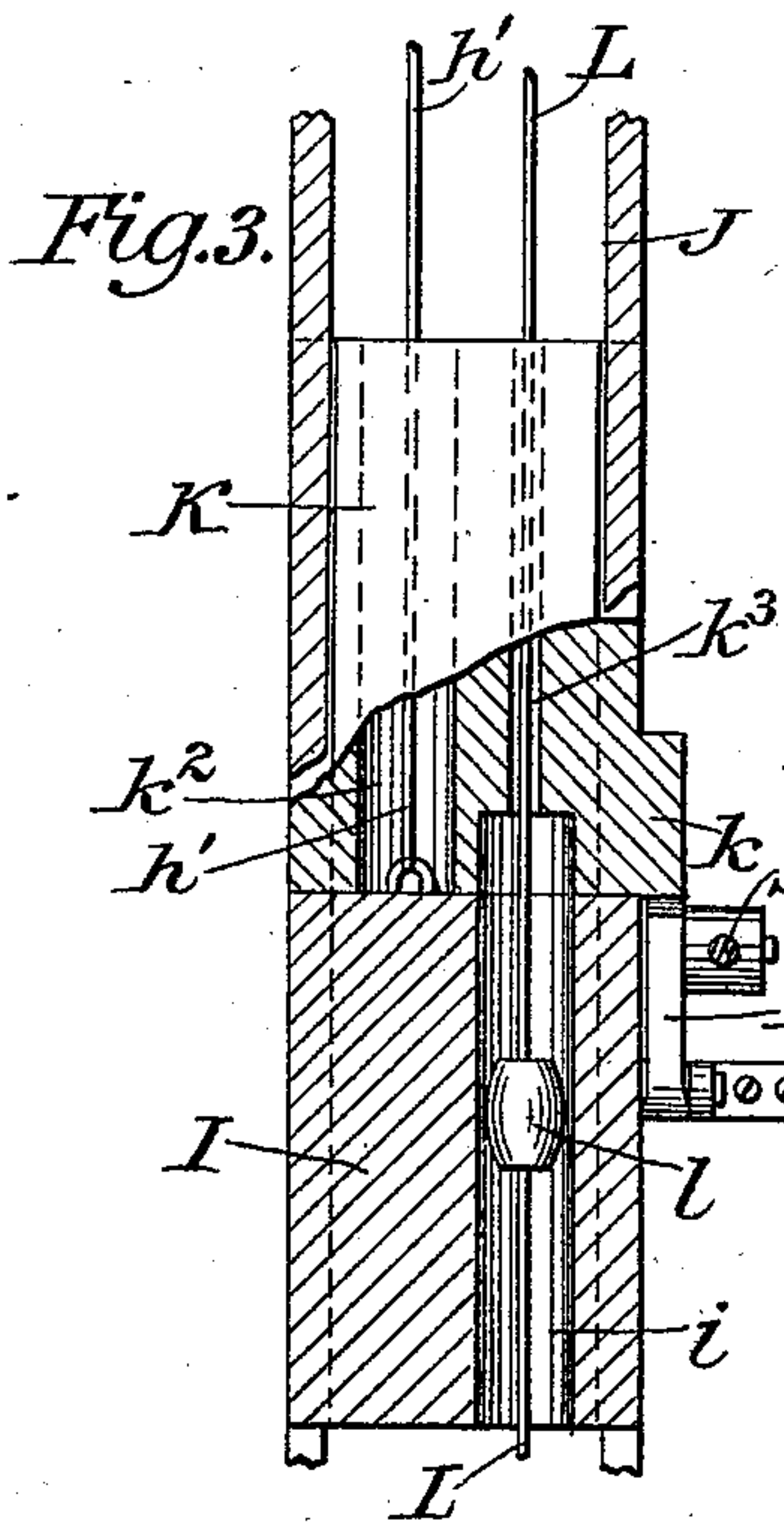
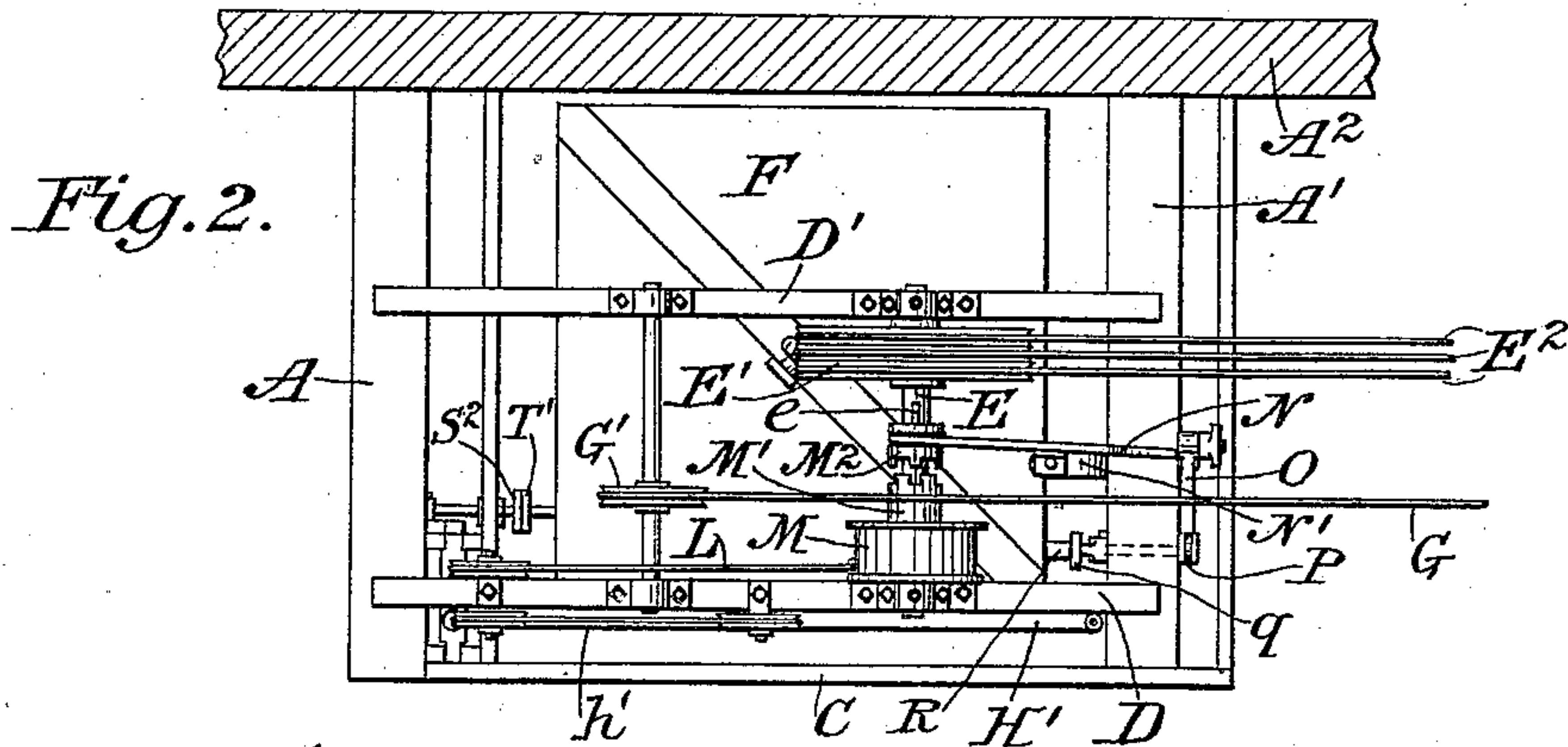
2 Sheets—Sheet 2.

C. F. DE ARDEN.

DEVICE FOR OPERATING GATES FOR ELEVATOR WELLS.

No. 529,161.

Patented Nov. 13, 1894.



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UNITED STATES PATENT OFFICE.

CHARLES F. DE ARDEN, OF NEW YORK, N. Y.

DEVICE FOR OPERATING GATES FOR ELEVATOR-WELLS.

SPECIFICATION forming part of Letters Patent No. 529,161, dated November 13, 1894.

Application filed March 1, 1894. Serial No. 501,909. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. DE ARDEN, of the city, county, and State of New York, have invented certain new and useful Improvements in Devices for Operating Gates to Elevator-Wells; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to the means for opening and closing the gates or doors across the approaches to elevator wells. Various means have been devised hitherto for operating such gates automatically, but such means for the most part have either been too complicated to be thoroughly practical or have been too slow in opening and closing the gate, whereby too much time is lost on the one hand and on the other hand the approaches are left open either wholly or in part for a greater or less length of time after the car has left the level of the floor.

It is the object of my present invention to provide improved means which shall be thoroughly practical in their application and by which the gate shall open and close quickly and while the car is still substantially on the level of the floor.

In the accompanying drawings, wherein I have illustrated the approved form of my invention, I have shown it as applied to an elevator of ordinary construction and have represented the gate as adapted to rise above the door-way, but it will be obvious that the general construction and arrangement of the elevator mechanism are immaterial and that the gate itself might be arranged to open and close in other ways than that represented.

In the drawings: Figure 1 is a front elevation of an elevator shaft, with the front sheathing partly removed, with the floors and side walls in section and with parts broken out. Fig. 2 is a top view of the operative mechanism with the rear wall shown in section. Fig. 3 is a detail view partly in section showing the weights employed in connection with the gate and a portion of their operating and controlling devices. Fig. 4 is a detail view partly in elevation and partly in section in a plane at right angles to that of Fig. 3, showing the

same parts and showing also some of the devices mounted upon the car. Fig. 5 is a top view of the devices above referred to as mounted upon the car. Fig. 6 is a detail view of a portion of the clutch operating mechanism hereinafter referred to; and Fig. 7 is a detail view, partly in section and partly in front elevation, showing a modification of a portion of the actuating mechanism.

The elevator well may be constructed in any usual or preferred manner and is represented in the drawings as having side walls A and A' and a rear wall A² which rise through the successive floors, two of which are represented at B and B'. The front of the well is closed in by any suitable grating or sheathing, as at C, through which are formed the approaches or doorways to the shaft, one of which is indicated at C' in Fig. 1. On top of the well, on suitable cross beams D and D', are supported some of the devices which are concerned with the movement of the car and with the operation of the gates. In suitable bearings on said cross beams is mounted a shaft E to which are fixed the sheaves E' over which pass the hoisting cables E² from the car F to the hoisting engine, which need not be further referred to herein. The shaft E therefore rotates in one direction or the other as the car moves up or down. The usual starting rope G, having fixed thereon a stop g for each floor, runs through the car F and over a guide pulley G' at the top of the well and thence to the hoisting engine to which its ends are connected in the usual manner.

As represented in Fig. 1 the gates H and H' are adapted to slide vertically on guide rods h and to rise above the respective door-ways. Each gate is connected by a cord h' to a counterbalance weight I which moves in a suitable guide-way J. The weight I is not sufficient of itself to raise the gate H nor to hold it in its elevated position but merely offsets a portion of the weight of the gate and makes the movements of parts correspondingly easier. It has, however, a more important function as a stop for co-operation with other devices as hereinafter referred to. Above each weight I in the guide-way J is placed an independent weight K which at times is adapted to rest upon the weight or stop I, effecting the movement of the gate by

its added weight, and at times to be lifted clear of the weight or stop I and to be held in its elevated position by a suitable latch in order to permit the gate to descend and to remain in a position to close the approach to the well. For co-operation with the latch K' which holds the weight K in its elevated position the latter is provided with a lug or projection k which extends through a slot in the side of the guide-way J. As represented in Fig. 3 the weight K may be perforated as at k^2 to permit the passage of the cord h'

All of the weights K are adapted to be raised by a single cord L which is provided with a suitable stop l for each weight K and is connected at its upper end to a drum or arm M which is loosely mounted on the shaft E. As the most convenient arrangement of the weights K and I requires the former to be superimposed directly upon the latter a hole i is formed through each weight I through which the stop l can move freely. It will be understood that the cord L is not fixed to the weights K but that it moves freely through a hole k^3 in each weight K, which hole is not of sufficient diameter to permit the passage of the stop l . As above stated the drum or arm M is mounted loosely upon the shaft E and consequently does not always rotate therewith. It is, however, adapted to be engaged with said shaft for a sufficient length of time to raise to the proper height whatever weight K may have been previously dropped and then to be disengaged therefrom. Any convenient arrangement may be employed for that purpose, and I have represented in Fig. 2 the drum M as fixed to a sleeve M' which is loose upon the shaft E and constitutes one member of a clutch, the other member M² of which is adapted to slide longitudinally on the shaft E but is made to rotate therewith by a feather e . This clutch is arranged to be opened by the movement of the car, the sliding member of the clutch being engaged by one arm of a lever N which is pivoted on a suitable support N' at the top of the well while the other end of said lever is engaged by one arm of a bell-crank O. To the horizontal arm of said bell-crank is connected a rod P. At a suitable height above each floor and at such other points as may be necessary the rod P bears a projection p which is adapted to be engaged by a horizontal arm of a corresponding bell-crank Q, the vertical arm of which bears a cam-like projection q . Upon the side of the car F is fixed a cam-like projection R which, as the car reaches the level of the floor or passes any other point where a bell-crank O is placed, strikes the projection q and lifts the rod P thereby causing the disengagement of the clutch and allowing the drum M to be free to unwind the cord L.

Any suitable arrangement of devices for effecting the release of the drum M may be employed according to the requirements of each particular case, it being only necessary

that the drum shall be free as the car comes to a stop at the level of each floor. The weight of the rod P may be relied upon to effect the re-engagement of the clutch as soon as the lever Q is released, or a spring might be employed for the purpose.

It is obvious from the foregoing that all of the weights K would be allowed to fall when the clutch is opened unless additional means are employed to retain them in their elevated positions. The latches K' constitute such means and are themselves adapted to be released as the car stops at the floors, thereby releasing the weight K for that floor alone at which the car stops and permitting it to raise the corresponding gate. The latches K' are arranged to be operated from the car itself and I prefer that the same means which are employed to stop the car shall also release the latch. For this purpose a spring-pressed bolt S is mounted to slide in a suitable bearing S' and is connected to the latch K' at one end. At its other end it bears a cam-like projection S². Upon the car is mounted a slide T which has at its outer end a cam-like projection T' which is adapted to be thrust outwardly as the car approaches the position in which it is to stop and, by contact with the cam S² to thrust back the latch K' and release the weight K. The slide T is preferably operated by a lever U which is pivoted on a bracket V and is formed with a key-hole slot t . A larger portion of said slot permits the free passage of the stops g but when the slide T is shifted the starting rope G then stands within the narrower portion of said slot and the stop g will be engaged by said slide thereby causing the necessary movement of the rope G to effect the stopping of the car.

I have hereinbefore referred to that part to which the cord L is attached as a drum but it is obvious that an arm might be used in place of a drum and such an arm I have shown at M^x in Fig. 7.

In describing the operation of my improved devices it will be assumed that all of the gates are in position to close the door-ways, as indicated at H in Fig. 1. The weights I are consequently in their highest positions and the weights K are held from the weights I by the latches K'. If the car starts from a lower floor while the gates are closed the drum M or its equivalent device will rotate and will draw up the cord L but at each floor the drum will be disengaged from its actuating mechanism and the weight of the cord L will immediately cause the drum to rotate backward. The operation of winding up and unwinding the cord will be repeated as the car passes each successive floor but the weights K will remain always in their elevated position until the car stops at a floor. Then the latch K' of that particular floor will be thrust back by the means described and will allow the weight K to fall which will then rest upon the weight I and lift the gate forthwith. As the car starts from the floor in either direction the drum M

or its equivalent will be immediately engaged with its actuating means and will wind up the cord L in one direction or the other, it making no difference whether the drum rotates in one direction or the other. As soon as the weight K is lifted from the weight or stop I the gate will immediately return to its original position, closing the door-way.

I claim as my invention—

1. In an elevator, the combination of a gate, a weight to move the same when released, hoisting mechanism for the elevator car, devices intermediate said hoisting mechanism and weight to lift the latter, and means to disengage said weight lifting devices from said hoisting mechanism, substantially as shown and described.

2. In an elevator, the combination of a gate, a weight to move the same when released, a car, hoisting mechanism for said car, devices intermediate said hoisting mechanism and weight to lift the latter, and means operated by the car in its movement to disengage said weight-lifting devices from said hoisting mechanism, substantially as shown and described.

3. In an elevator, the combination of a gate, a weight to move the same when released, a drum, means to rotate said drum, a cord connected to said drum to lift said weight and means to disengage said drum from its operating devices, substantially as shown and described.

4. In an elevator, the combination of a gate, a weight to move the same when released, a drum, means to rotate said drum, a cord connected to said drum to lift the weight, a car and hoisting mechanism therefor, and means operated by the car in its movement to disengage said drum from its operating means, substantially as shown and described.

5. In an elevator, the combination of a gate, a counterbalance weight therefor, a second

weight adapted to rest upon said first named weight to raise the gate, means independent of the first weight to lift the second weight from the first to allow the gate to close, a latch to retain said second weight in its elevated position and means to release said second weight, substantially as shown and described.

6. In an elevator, the combination of a gate, a weight to remove the same when released, hoisting mechanism for the elevator car, a drum loosely mounted upon a shaft of said hoisting mechanism, a cord connected to said drum and adapted to lift the weight, a clutch to which said drum may be connected to its shaft and means to disengage said clutch, substantially as shown and described.

7. In an elevator, the combination of hoisting mechanism, a car, a starting rope for said hoisting mechanism, said rope having a stop fixed thereon, a slide supported on said car and having a key-hole slot through which said starting rope is passed, whereby said slide may pass through said stop weight actuating the starting rope or may be moved to engage said stop, substantially as shown and described.

8. In an elevator, the combination of a gate normally held closed, a weight adapted to open said gate when released, a detent to hold said gate from action, an elevator car, hoisting mechanism therefor, a starting rope for said hoisting mechanism, and means carried by said car and adapted by a single movement to engage said starting rope and to release said latch as the car comes to rest, substantially as shown and described.

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

CHARLES F. DE ARDEN.

Witnesses:

A. N. JESBERA,
A. WIDDER.