

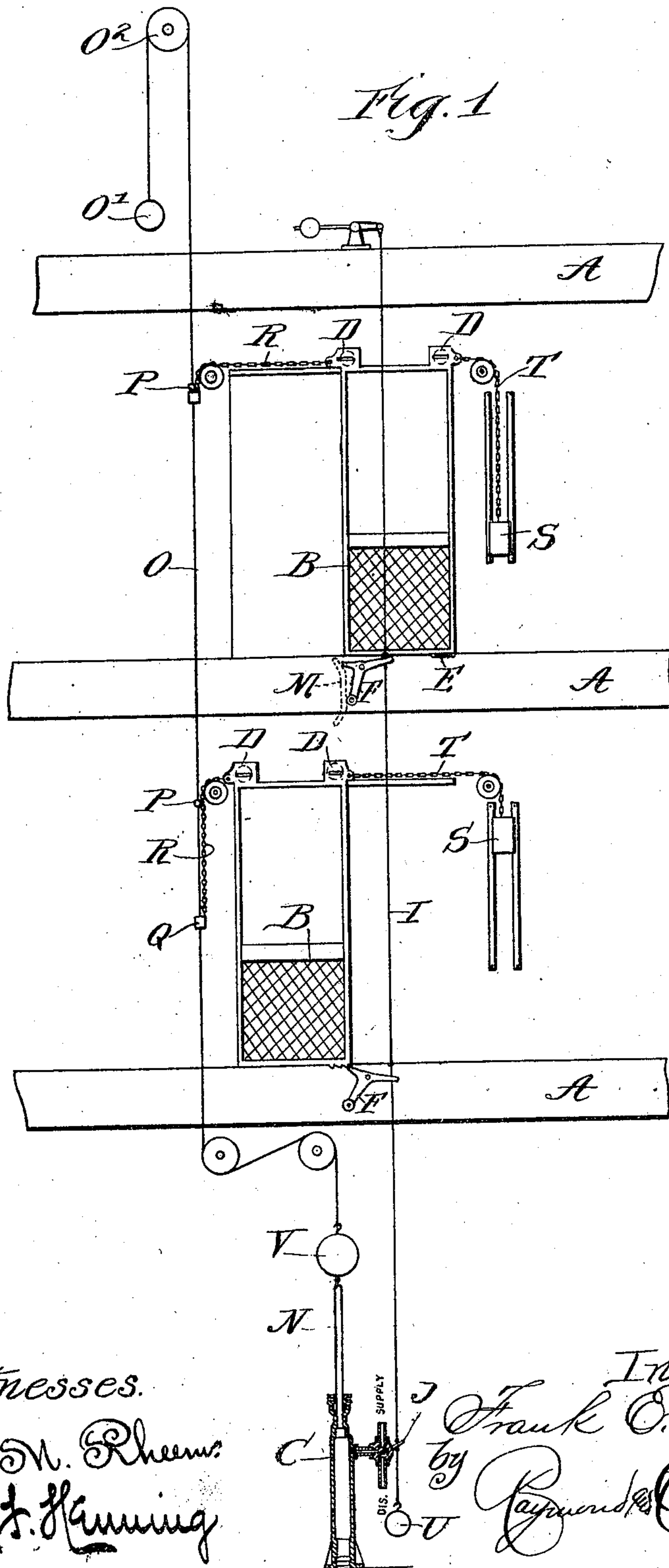
(No Model.)

2 Sheets—Sheet 1

F. E. HERDMAN.  
ELEVATOR DOOR ATTACHMENT.

No. 557,204.

Patented Mar. 31, 1896.



Witnesses.

Wm. F. Hanning

Inventor.

Frank O. Herdman  
by Raymond & Quinlan  
Atty's.

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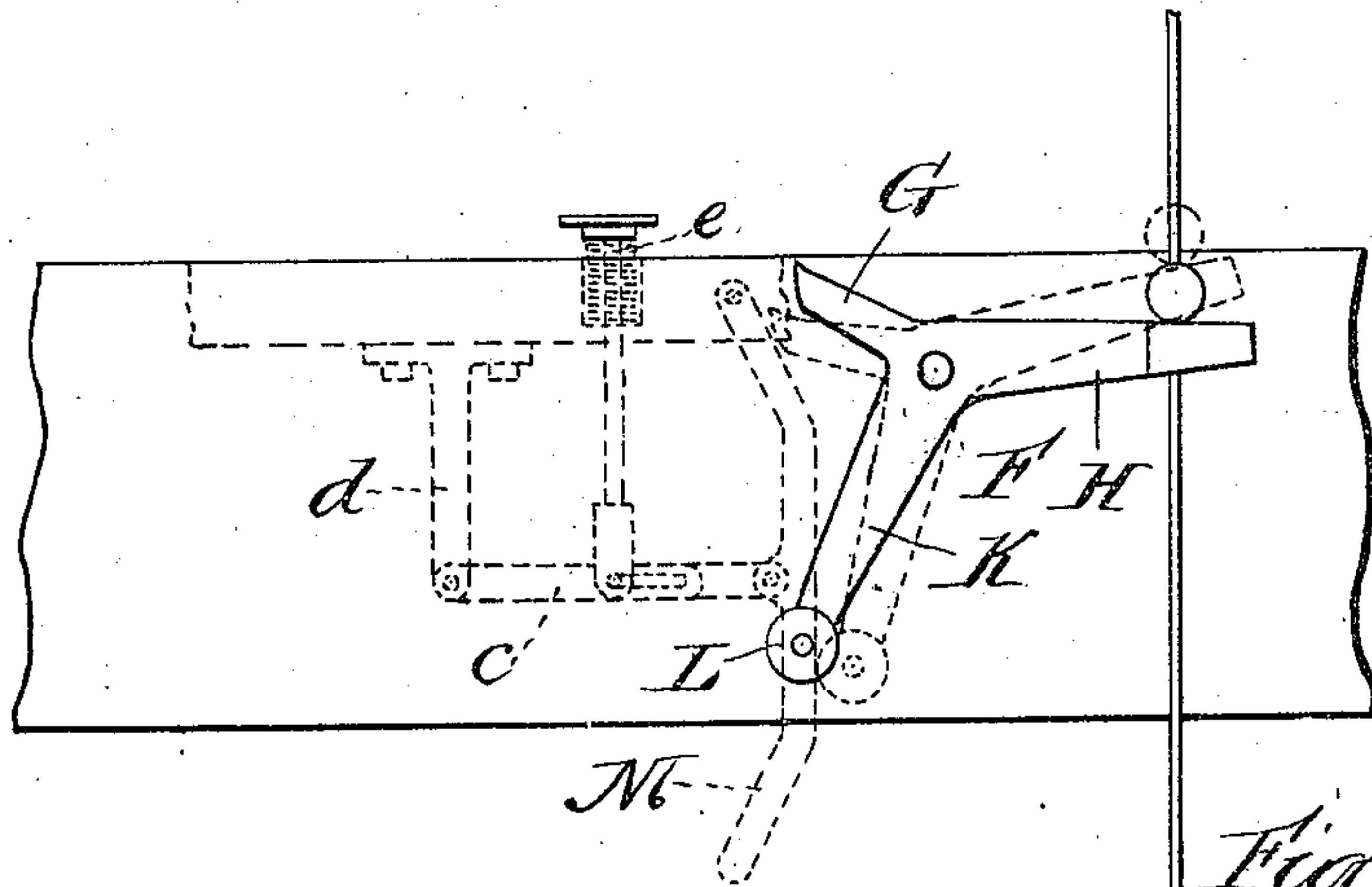
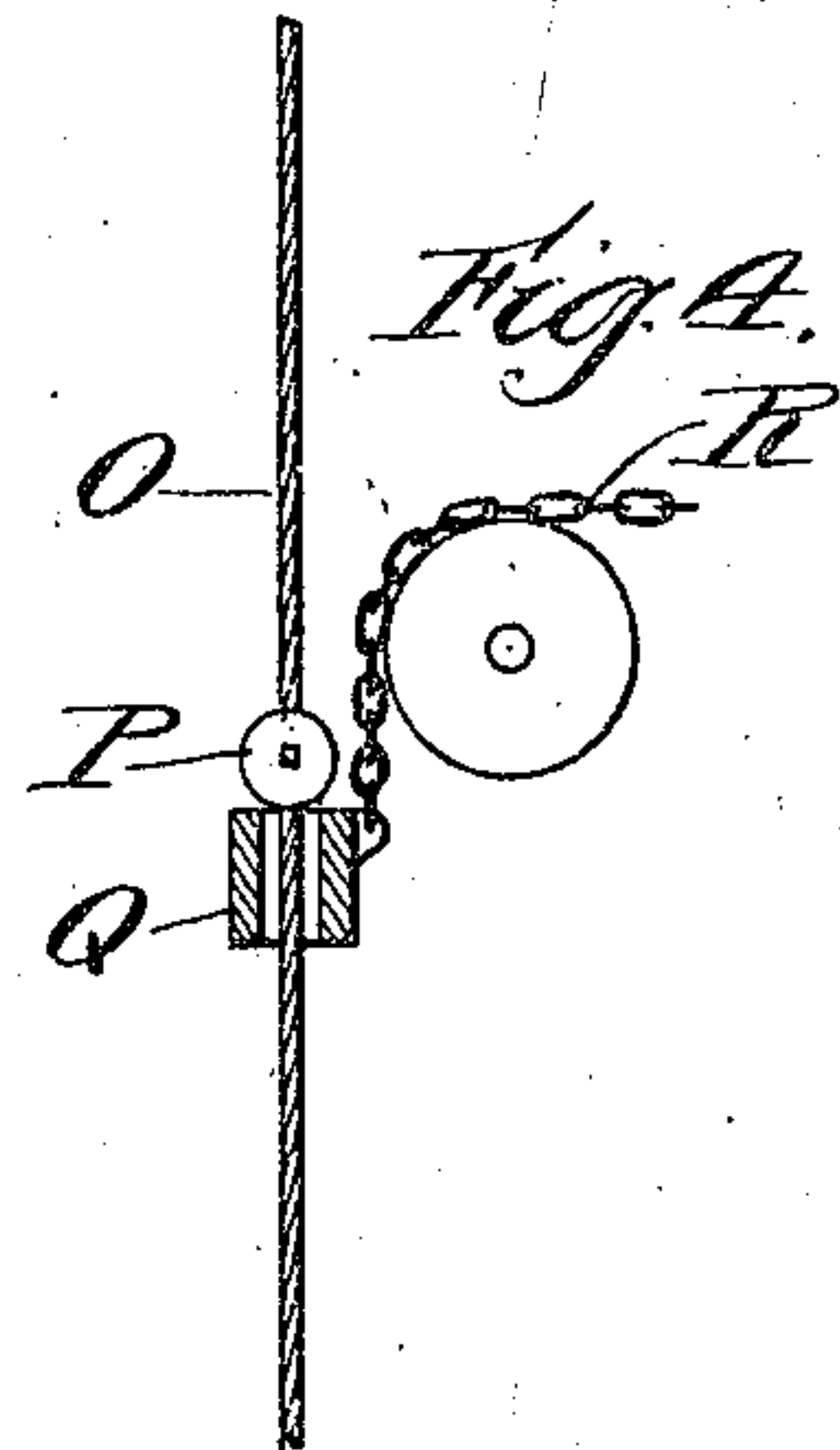
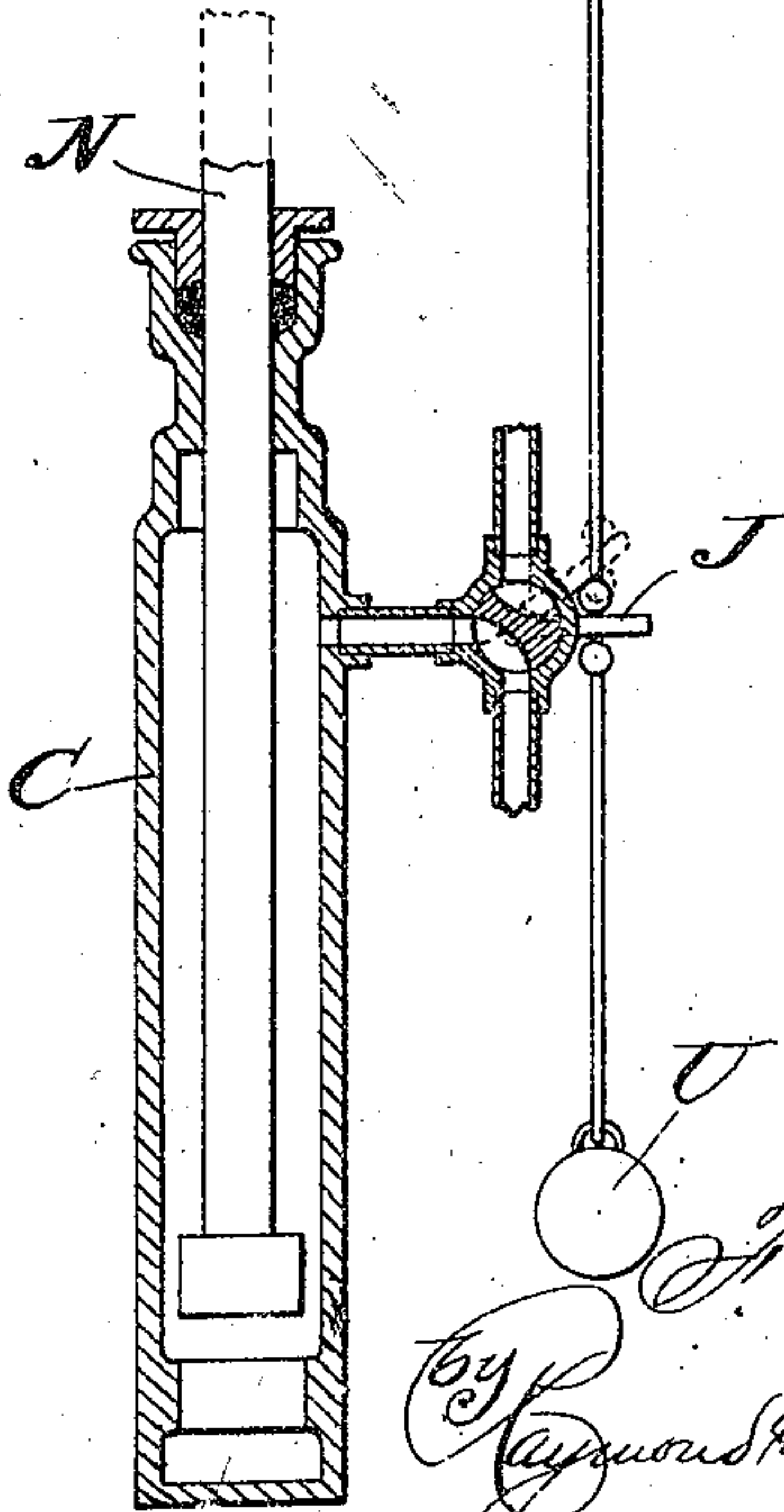
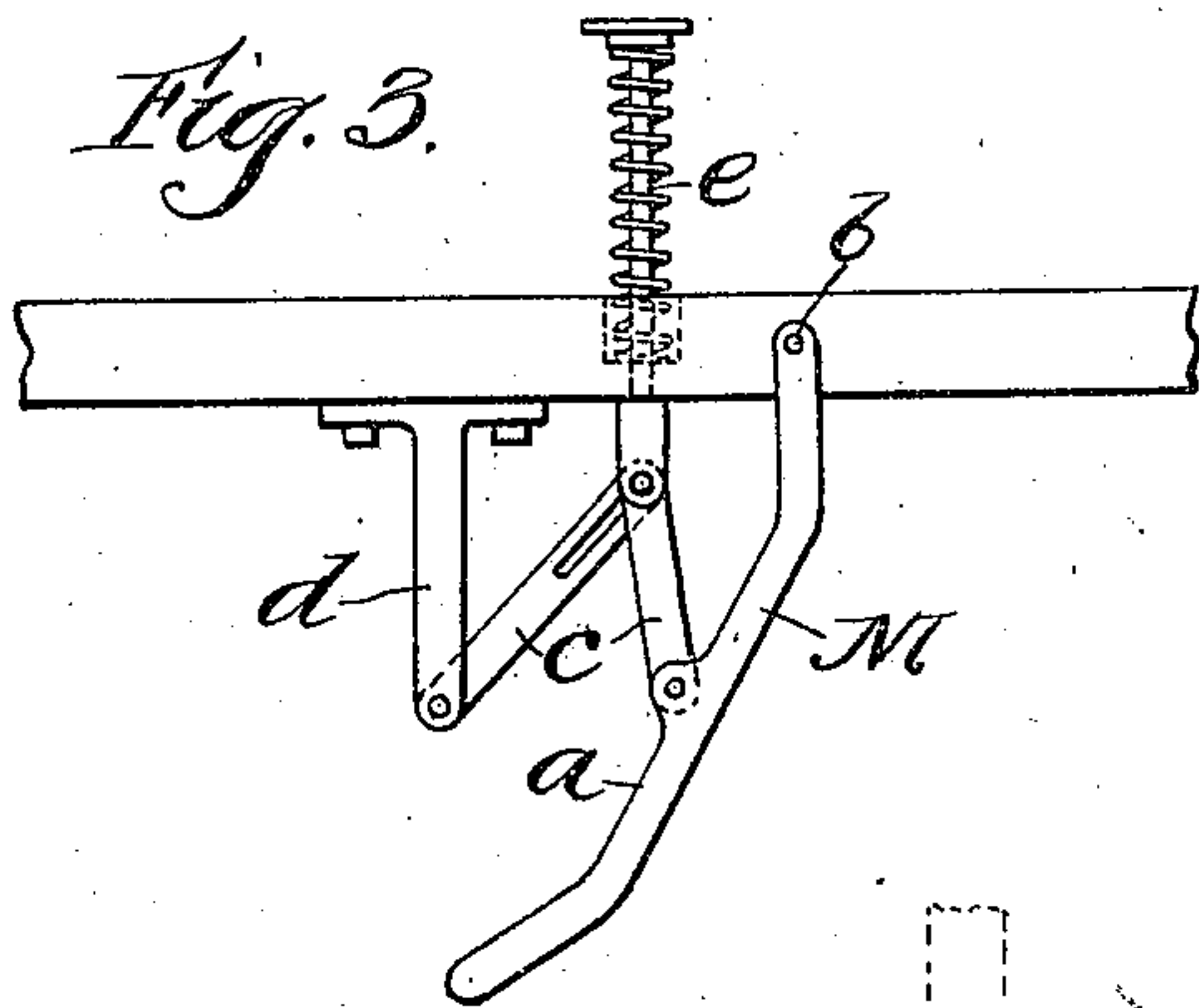


Fig. 3.



Witnesses.

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Inventor  
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# UNITED STATES PATENT OFFICE.

FRANK E. HERDMAN, OF WINNETKA, ILLINOIS.

## ELEVATOR-DOOR ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 557,204, dated March 31, 1896.

Application filed July 22, 1895. Serial No. 556,867. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK E. HERDMAN, a citizen of the United States, and a resident of Winnetka, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elevator-Door Attachments, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in attachments for elevator-doors, and more particularly to that class of devices known as "door opening and closing" devices, by means of which elevator-doors may be opened and closed by power other than the manual effort of the operator.

This invention has for its prime object to enable the elevator-doors at any floor in a building to be opened and closed independent of the other doors under the control of the operator, and practically without manual effort on the part of the operator, and which attachment is of such character that the door cannot be opened until the car reaches a floor, nor can it be left open after the car leaves the floor, although the door may be closed before the car leaves the floor. These and such other objects as may hereinafter appear are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 shows a diagrammatic elevation of the floors of a building, showing a door-closing apparatus embodying my invention. Fig. 2 represents an enlarged detail view of the actuating mechanism. Fig. 3 represents a detail view of the control device, and Fig. 4 represents a similar view of the operating-cable and its connections.

Similar letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings, let A indicate the floors of a building, B the doors of the elevator-shaft, and C a motor of any suitable kind, that shown in the drawings being a hydraulic motor. In Fig. 1 the upper door is shown in an open position and the lower door is closed.

The door is hung at its upper edge upon antifriction-rollers D in any well-known and usual manner, and at its lower rear edge is

provided with a toothed rack E, adapted to be engaged by a pivoted catch F when the door is in the closed position. This catch, as shown more clearly in Fig. 2, has three arms or branches and is preferably pivoted at the point of junction of the arms. The arm G is in the form of a dog adapted and arranged to engage the rack E. The arm H is adapted and arranged to engage a control-cable I, connected with the valve J of the motor C. The third arm K preferably carries an antifriction-roller L and is adapted and arranged to engage a control-plate M, which latter is attached to and carried by the car and is so adapted and arranged that when the operator desires it may be thrown into such position that its path will be crossed by the arm K, which latter will thereupon cause the catch F to swing upon its pivot and disengage the arm G from the door, and at the same time lift the arm H, so as to open the valve J and admit pressure to the motor C. When pressure is admitted to the motor C, the weighted plunger N thereof is raised, thereby permitting the operating-cable O, which is attached at its lower end thereto, to be raised by a weight O' attached to its opposite end, the cable being trained over a pulley O'' at the top of the elevator-shaft and always held taut by said weight.

The cable O is provided with a series of buttons P and works through sleeves Q, attached to short chains or cables R, which latter are in turn attached to the upper forward corners of the doors. The normal position of the buttons is such that when the doors are closed the buttons occupy their lowest position and are in, or nearly in, engagement with the sleeves Q. After a door is released, as the button rises the door is free to be moved back to an open position under the influence of a weight S, attached by a chain or cable T to the upper rear corner of the door.

As soon as the control device M is moved out of engagement with the catch F the control-cable I is moved downward under the influence of the weight U and the valve J is reversed and the water or other motor fluid is discharged from the motor-cylinder. When this takes place, the weight of the motor-plunger being greater than that of the weight O' causes the plunger to return to its normal lower position, moving the operating-cable O.



back to its original position, through which operation the button P at the open door will engage the sleeve Q of such door and cause the door to move forward to its closed position. In high buildings the weight of the motor-plunger may be increased to any desired extent by the addition of a weight V. Of course as long as the control device M remains in the normal position (shown in Fig. 3) it will pass by each door without causing any operation thereof; but whenever the operator desires to open a door it is only necessary to project the control device M, so that as the car moves to the floor it will engage the pivoted catch, when the operations just described will take place automatically.

Obviously many different forms of control devices may be employed for accomplishing this object, that shown in the drawings being an embodiment of such a device, consisting of a plate *a*, pivoted at *b* to the floor of the car and connected by a pair of toggle-levers *c* with a bracket *d* or any other stationary part of the car. Extending up into the car is a spring-actuated push-rod *e* connected with the toggle-levers *c*, which when depressed by pressure from the foot of the operator causes the toggle-levers to straighten out, as illustrated by dotted lines in Fig. 2, and thereby swing the plate *a* upon its pivot into position to engage the pivoted catch.

Obviously the door cannot be opened at any floor until the elevator arrives at the door of such floor, and while the door may be again closed before the elevator starts to leave the floor the elevator obviously cannot leave the floor without the door being automatically closed.

This device is exceedingly simple, durable, and economical, has few parts to get out of order, is automatic in closing the doors, and relieves the operator of practically all manual effort in both opening and closing the doors. By the disposition of the parts shown and described any door may be opened and closed independently of the other doors.

It will be observed that in practice the operating-cable exerts a restraining influence upon the doors after they are released by the catches, so that the doors cannot open any more rapidly than the cable permits. In other words, as soon as a door is released by its catch the weight S thereof starts to open the door and brings the sleeve Q in contact with the button P, and as the sleeve cannot rise any more rapidly than the button the door is restrained, and the jar or shock of a sudden and rapid opening of the door is thereby avoided. On the other hand, when the door is closed by the action of the operating-cable any jar or shock is avoided by the fact that the operating-cable is restrained in its motion by the motor, which cannot operate any more rapidly than the water is discharged therefrom by the weight of the piston thereof.

Obviously various modifications of my invention may be made without departing from the spirit thereof, as other means than the weight S may be employed for actuating the door to open when unrestrained and other mechanical devices may be substituted to perform the work of the operating-cable.

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

1. An elevator-door attachment, comprising a door actuated to open when unrestrained, a catch for holding said door closed, an operating-cable for closing said door, a control-cable and motor for the operating-cable operated from the elevator-car, and means carried by said car for releasing said catch and actuating the control-cable, substantially as described.

2. An elevator-door attachment, comprising a door actuated to open when unrestrained, a catch for holding said door closed, a weighted operating-cable for closing said door, a control-cable and motor for the operating cable operated from the elevator-car, and means carried by said car for releasing said catch and actuating the control-cable, substantially as described.

3. An elevator-door attachment, comprising a door actuated to open when unrestrained, a catch for holding said door closed, a weighted operating-cable for closing said door and restraining it in its opening movement, a control-cable and motor for the operating-cable operated from the elevator-car, and a control device carried by the elevator-car and adapted to simultaneously release said catch and actuate the control-cable, substantially as described.

4. An elevator-door attachment, comprising a door opened under the influence of a weight, a weighted operating-cable for closing said door, a motor for the operating-cable and a control-cable therefor, a catch adapted to hold the door in a closed position, and a control device carried by the car and adapted to simultaneously release said catch and actuate the control-cable, substantially as described.

5. An elevator-door attachment, comprising a door opened under the influence of a weight, a weighted operating-cable for closing said door, a motor for the operating-cable and a control-cable therefor, a catch adapted to hold the door in a closed position, a control device carried by the car and adapted to simultaneously release said catch and actuate the control-cable, a series of buttons on said control-cable, and a series of sleeves connected to the doors and adapted to be engaged by said buttons, substantially as described.

FRANK E. HERDMAN.

Witnesses:

CHAS. B. BOWEN,  
M. E. SHIELDS.