

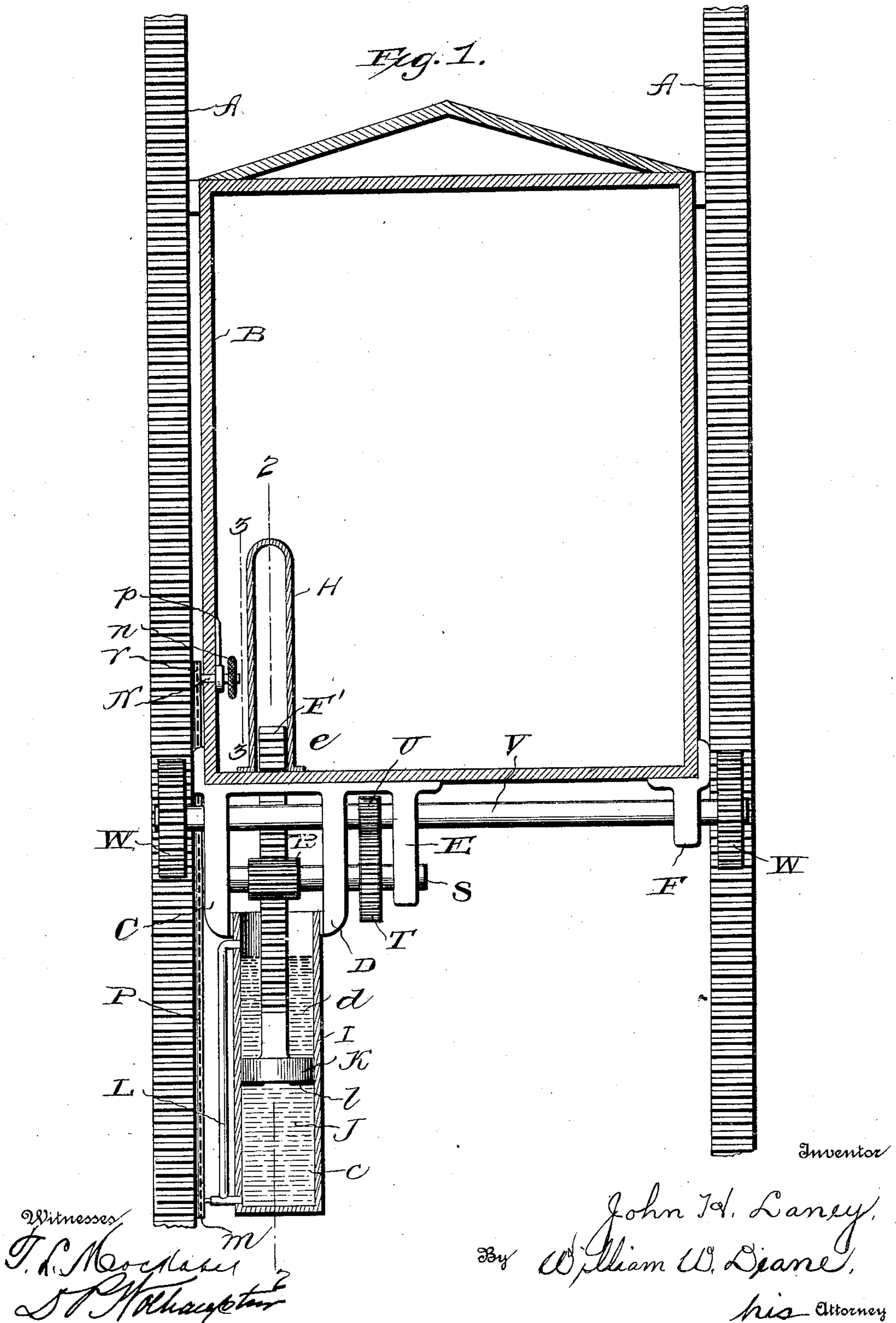
No. 828,753.

PATENTED AUG. 14, 1906.

J. H. LANEY.
SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED SEPT. 12, 1905.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

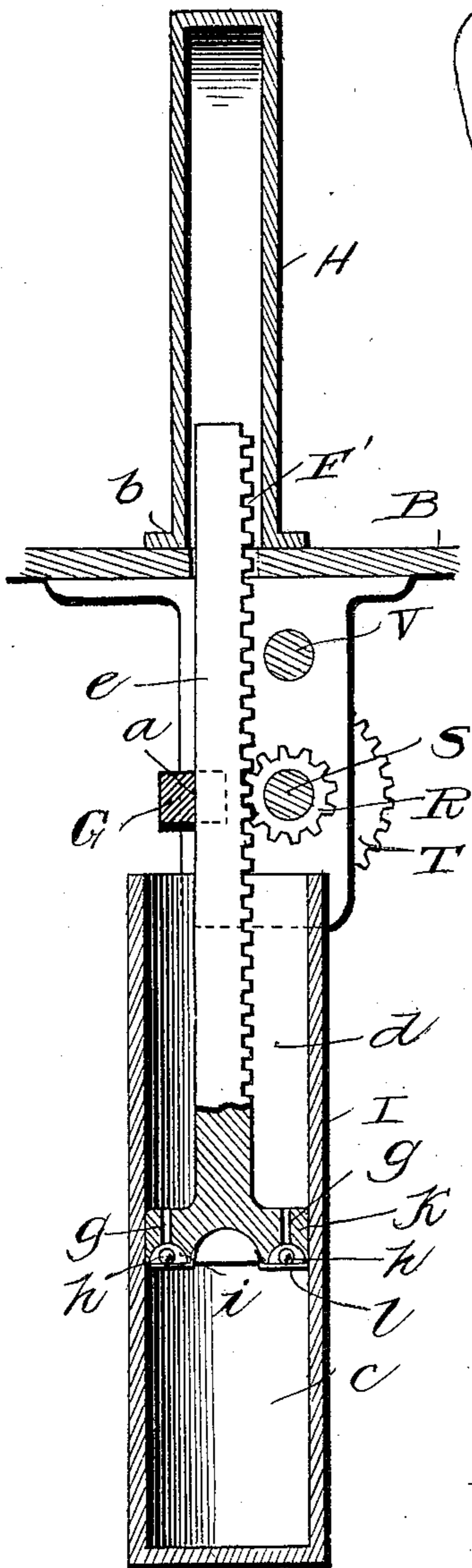


Fig. 3.

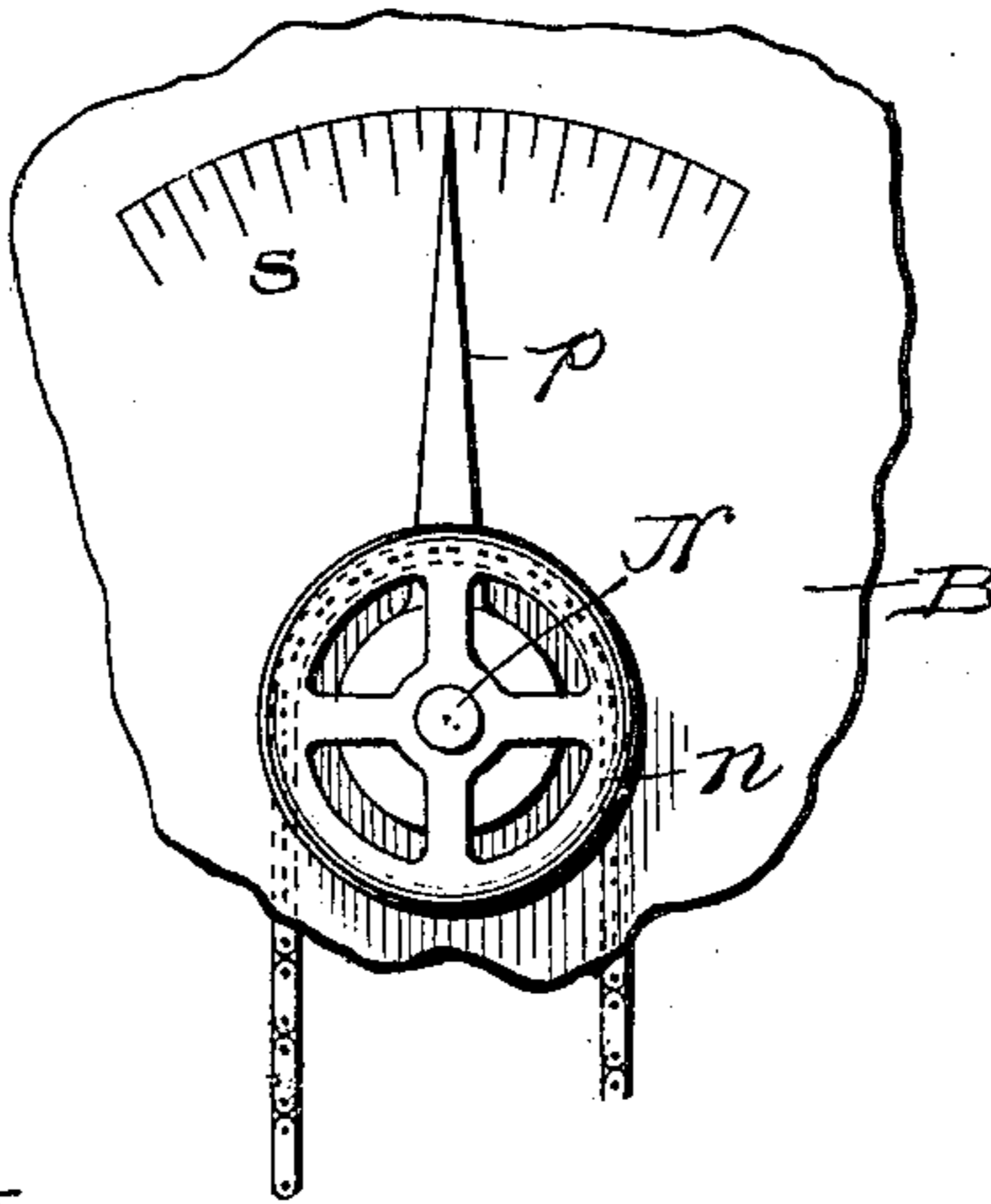


Fig. 5.

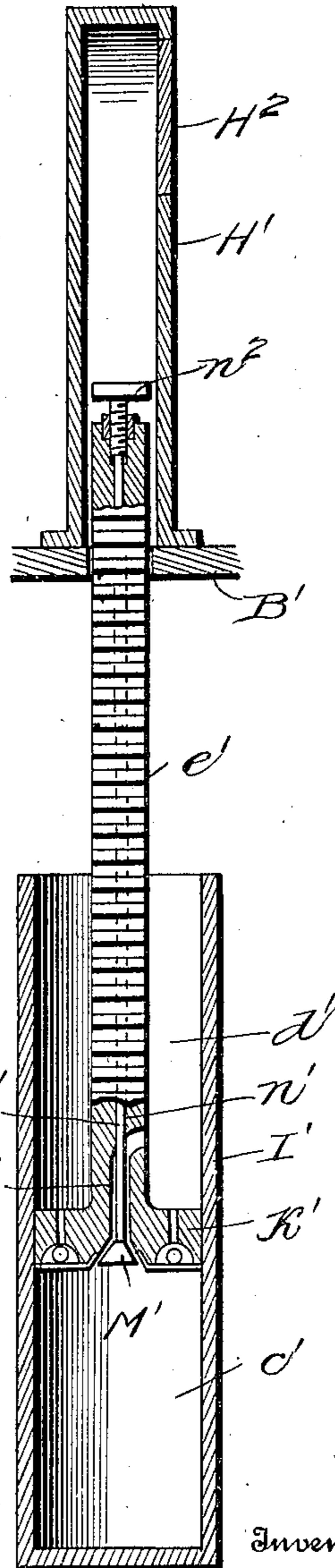


Fig. 4.

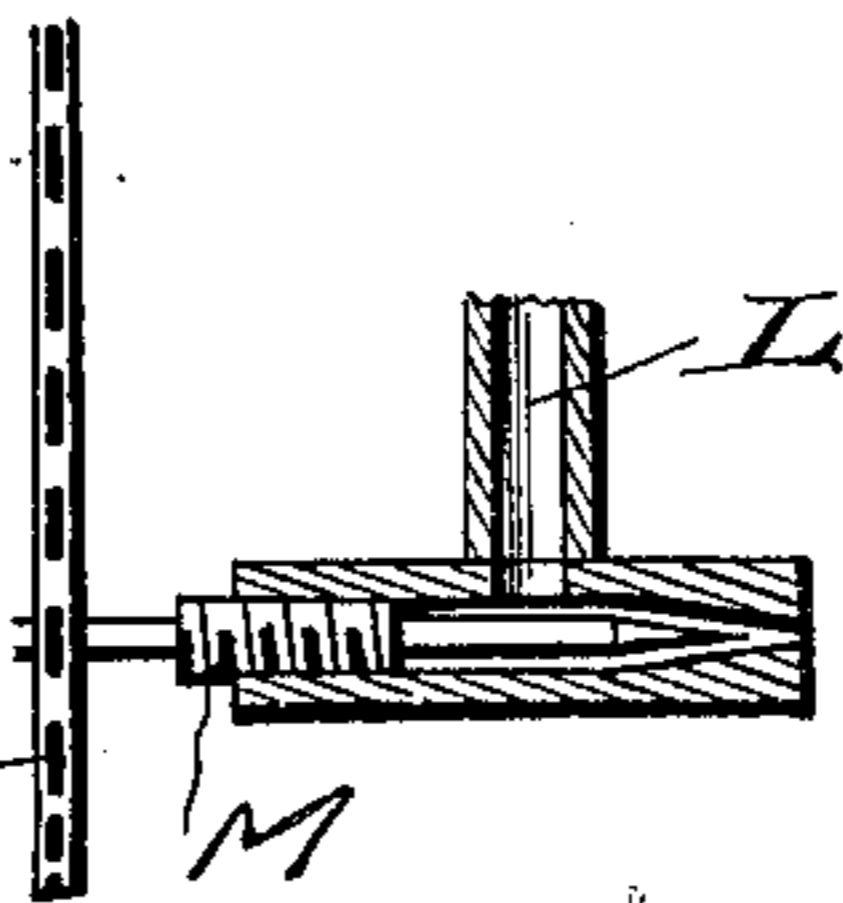
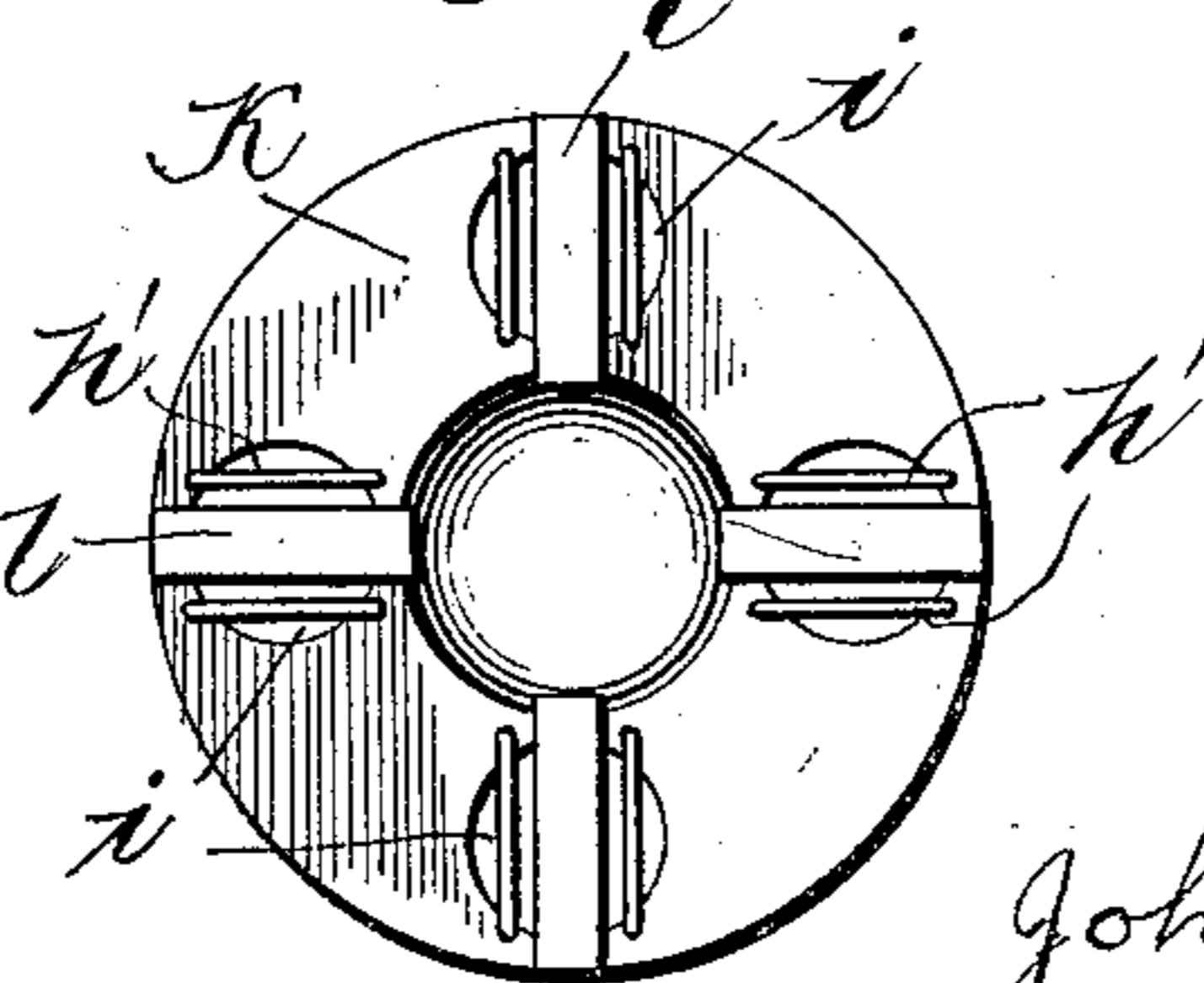


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR ELEVATORS.

No. 828,753.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed September 12, 1905. Serial No. 278,112.

To all whom it may concern:

Be it known that I, JOHN H. LANEY, a citizen of the United States, residing at Savannah, in the county of Andrew and State of Missouri, have invented certain new and useful Improvements in Safety Devices for Elevators, of which the following is a specification.

My invention pertains to safety devices for passenger and freight elevators; and it has for one of its objects to provide an automatic safety device calculated to effectually prevent an elevator-car from moving down at an unduly high rate of speed.

Another object of the invention is the provision of a device of the character stated embodying means whereby the conductor or any other person in the elevator-car is enabled to regulate—i. e., increase or diminish—the speed at which the car descends.

Other advantageous features of the invention will be fully understood from the following description when the same is considered in connection with the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view illustrating an elevator-shaft and an elevator-car equipped with the improvements constituting the present and preferred embodiment of my invention. Fig. 2 is a vertical section taken at right angles to Fig. 1 and in the plane indicated by the line 2 2 of said figure looking toward the right. Fig. 3 is a detail view taken at the line 3 3 of Fig. 1 looking toward the left. Fig. 4 is an enlarged detail view of the mechanism for controlling the passage of fluid from the lower chamber of the piston-cylinder to the upper chamber thereof. Fig. 5 is a view of a modified construction hereinafter referred to in detail, and Fig. 6 is a bottom plan view of the piston.

Referring by letter to the said drawings, and more particularly to Figs. 1 to 4 thereof, A A are upright racks fixed at opposite sides of an elevator-shaft. B is an elevator-car movable vertically between the said racks and designed to be raised and lowered by the ordinary well-known means or any other means compatible with the purposes of my invention. C, D, E, and F are hanger-bearings fixed to and arranged below the bottom of the car B. G is a cross-bar interposed between and fixed to the bearings C and D and

having a vertical groove *a* in one of its sides for a purpose hereinafter set forth. H is a hood arranged over an opening *b* in the bottom of the car B and fixed to and extending upwardly from said bottom, and I is a cylinder connected to and depending from the hanger-bearings C and D and closed at its lower end, as shown. This cylinder I is designed to contain oil or other suitable fluid (indicated by J) and is divided by a rectilinearly-movable piston K into a lower chamber *c* and an upper chamber *d*. The piston K is provided with an upwardly-extending rod *e*, which passes through an opening in the upper end of cylinder I and into the hood H and bears a rack F', and it is also provided with four (more or less) vertical passages *g*, controlled by upwardly-seating ball or other suitable valves *h*. These ball-valves rest in cages formed by recesses *i* in the lower side of the piston and rods *h'*, extending across said recesses, and they are normally held in their cages by light spring-strips *l*, as shown. L is an upright pipe arranged at the outer side of the cylinder I and connecting the lower and upper chambers thereof. M is a threaded needle-valve arranged to control the passage of oil or other fluid through said pipe and bearing a sprocket-wheel *m*. N is a shaft journaled in one side wall of the elevator-car and bearing a hand-wheel *n*, a pointer *p*, and a sprocket-wheel *r*, the latter being disposed outside of the car, and P is a sprocket-belt connecting the sprocket-wheels *m* and *r*. This mechanism is designed to enable a person in the car B to regulate the speed at which the car descends, as will hereinafter be more fully explained, the pointer *p* being movable in front of a dial *s*, Fig. 3, in order that the desired speed may be determined. The rod *e* of piston K is guided in the groove *a* of cross-bar G, and at the opposite side of the rod with reference to said cross-bar is arranged a pinion R, which is intermeshed with the rack F' on the rod. Said pinion R is fixed on a shaft S, which is journaled in the hanger-bearings C, D, and E and also carries a spur-gear T. This latter is intermeshed with a pinion U and a shaft V, which is journaled in the hanger-bearings C, D, E, and F and bears spur-gears W, intermeshed with the fixed racks A.

The practical operation of my improved safety device is as follows: On the downward

movement of the car B the spur-gears W are rotated, with the result that the piston K is slowly forced downward in the cylinder I against the resistance offered by the oil in the lower chamber thereof. Incident to the downward movement of the piston the oil is forced from the lower chamber *c* of cylinder I up through the pipe L to the upper chamber *d* of the cylinder. The escape of oil from the lower chamber *c* of cylinder I controls the descent of the car, and hence it will be observed that the car is effectually prevented from moving downwardly at an unduly high rate of speed. It will also be observed that the speed at which the car descends may be increased by moving the valve M outwardly and may be diminished by moving said valve inwardly. In this connection it will be noticed that the valve M is adjusted by a person within the car B through the medium of the hand-wheel *n*, shaft N, sprocket-wheel *r*, sprocket-belt P, and sprocket-wheel *m*, and that such person is enabled by referring to the pointer *p* and dial *s* to fix the rate of speed at which the car descends. On the up movement of the car B the piston K is moved upwardly, and during such upward movement of the car and piston the oil passes through the pipe L into the lower chamber *c* and also passes through the passages *g* and past the valves *h* of the piston into said lower chamber *c*. The arrangement of the rod *e* of the piston K in the groove *a* of cross-bar G enables the said bar to properly guide the piston-rod and at the same time hold it in engagement with the pinion R.

It will be appreciated from the foregoing that in proportion to the purpose which it serves my novel device is simple and inexpensive in construction, also that the device is adapted to be readily applied to elevators at present in use, and that it embodies no delicate parts such as are likely to get out of order after a short period of use.

In the modified construction shown in Fig. 5 I have provided for the passage of oil from the lower chamber *c'* of a cylinder I' to the upper chamber *d'* thereof without resorting to the use of a pipe disposed outside of the said cylinder. The piston K', employed in the said modified construction, differs from the piston K, before described, in that it has a central passage L' extending from its lower side to its upper side. This passage L' is controlled by an upwardly-seating valve M', the stem *m'* of which extends up through a bore *n'* in the piston-rod *e'* and is provided at its upper end with a head *n²* and at a point adjacent to said end with a thread which bears in a correspondingly-threaded bore in the piston-rod. The piston-rod *e'* is disposed and movable in a hood H' on the bottom of the car B', and the said hood is provided with a door H², so that access may be readily gained to the head *n²* for the purpose of ad-

justing the valve M', and thereby varying the speed at which the car descends.

Having thus described my invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In an elevator safety device, the combination of an elevator-car having an opening in its bottom, a hood arranged over said opening and extending upwardly within the car, a cylinder hung from the car and containing fluid, a piston dividing said cylinder into two chambers and having a rod extending up into the said hood and bearing a rack, a conduit connecting the chambers of the cylinder, an upright rack fixed in the shaft in which the car is arranged to move, and connected gears intermeshed with the rack on the piston-rod and the fixed rack, respectively.

2. In an elevator safety device, the combination of an elevator-car having an opening in its bottom, a hood arranged over said opening and extending upwardly within the car, a cylinder hung from the car and containing fluid, a piston dividing said cylinder into two chambers and having a rod extending up into the said hood and bearing a rack, a conduit connecting the chambers of the cylinder, a valve controlling said conduit, means disposed in the car for adjusting said valve, an upright rack fixed in the shaft in which the car is arranged to move, and gearing carried by the car and connecting the fixed rack and the rack on the piston-rod.

3. In an elevator safety device, the combination of an elevator-car, a cylinder carried by the car and containing fluid, a piston dividing the said cylinder into two chambers, and having a rod bearing a rack, a conduit connecting the said chambers of the cylinder, an upright rack fixed in the shaft in which the car is arranged to move, a shaft journaled on the car and having a gear intermeshed with the fixed rack and also having a pinion, and a second shaft journaled on the car and having a gear intermeshed with the pinion of the first-mentioned shaft and also having a pinion intermeshed with the rack on the piston-rod.

4. In an elevator safety device, the combination of an elevator-car having an opening in its bottom, a hood arranged over said opening and extending upwardly within the car, a cylinder hung from the car and containing fluid, a piston dividing said cylinder into two chambers and having a rod extending up into the said hood, a conduit connecting the chambers of the cylinder, a fixed device disposed in the shaft in which the car is arranged to move, and means on the car and connected with the piston-rod for coöperating with the said fixed device and moving the piston synchronously with the car.

5. In an elevator safety device, the combination of an elevator-car, an upright cylinder

carried by the car and containing fluid, a piston dividing the said cylinder into two chambers and having an upright rod bearing a rack, an upright rack fixed in the shaft in which the car is arranged to move, and gearing carried by the car and connecting the rack on the piston-rod and the fixed rack.

6. In an elevator safety device, the combination of an elevator-car, a cylinder carried by the car and containing fluid, a piston dividing the said cylinder into two chambers, a fixed device disposed in the shaft in which the car is arranged to move, means on the car and coöperating with the said fixed device for moving the piston synchronously

with movement of the car, a conduit connecting the chambers of the cylinder, a valve controlling said conduit, a hand device disposed in the car and provided with a pointer, a dial arranged to coöperate with the pointer, and a driving connection intermediate the hand device and the valve for adjusting the latter by the former.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. LANEY.

Witnesses:

H. B. PYLE,

JAS. H. HUFFMAN.