

J. H. PAINE.

Stop Mechanisms for Elevators:

No. 157,722.

Patented Dec. 15, 1874.

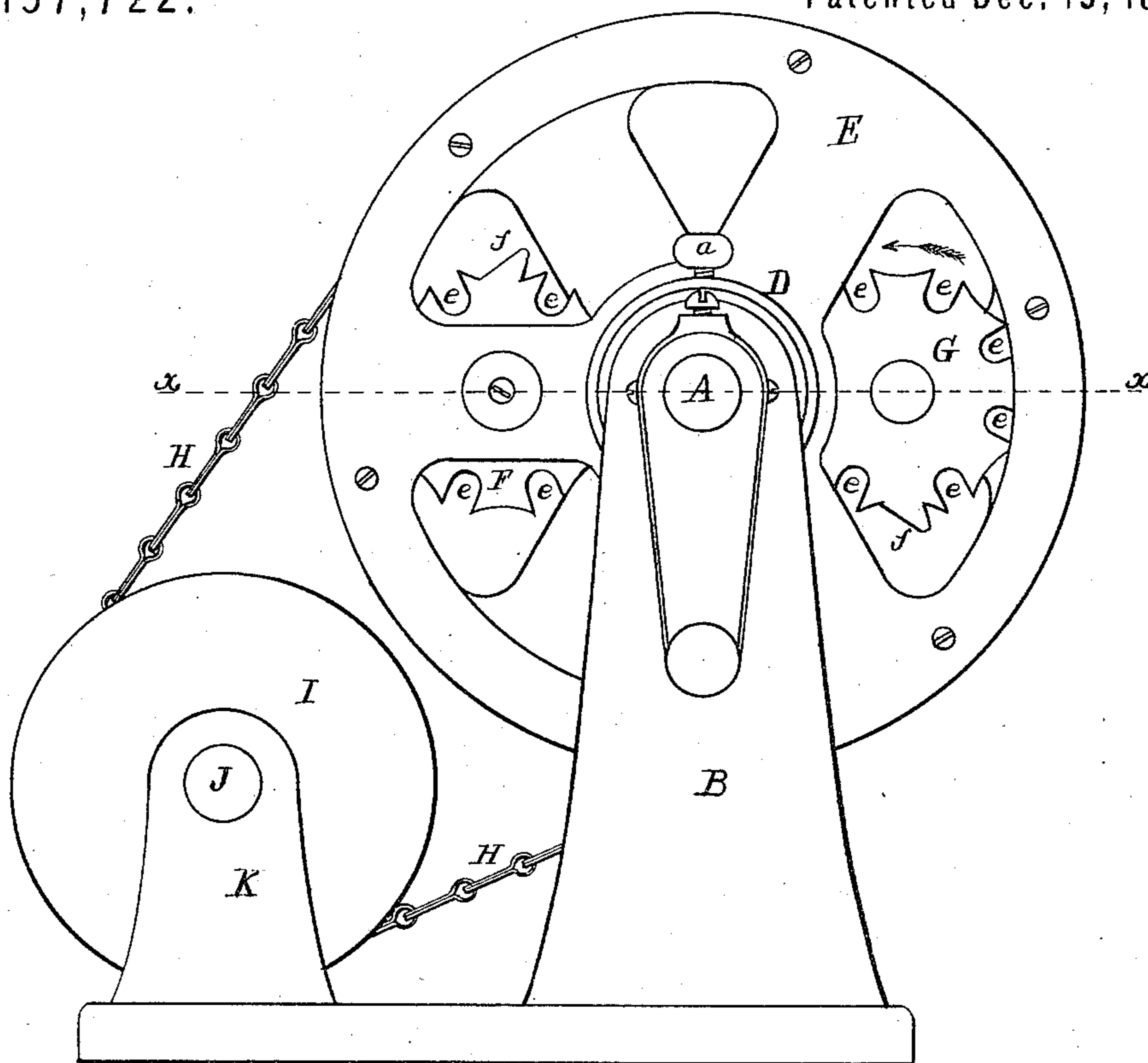


Fig. 1.

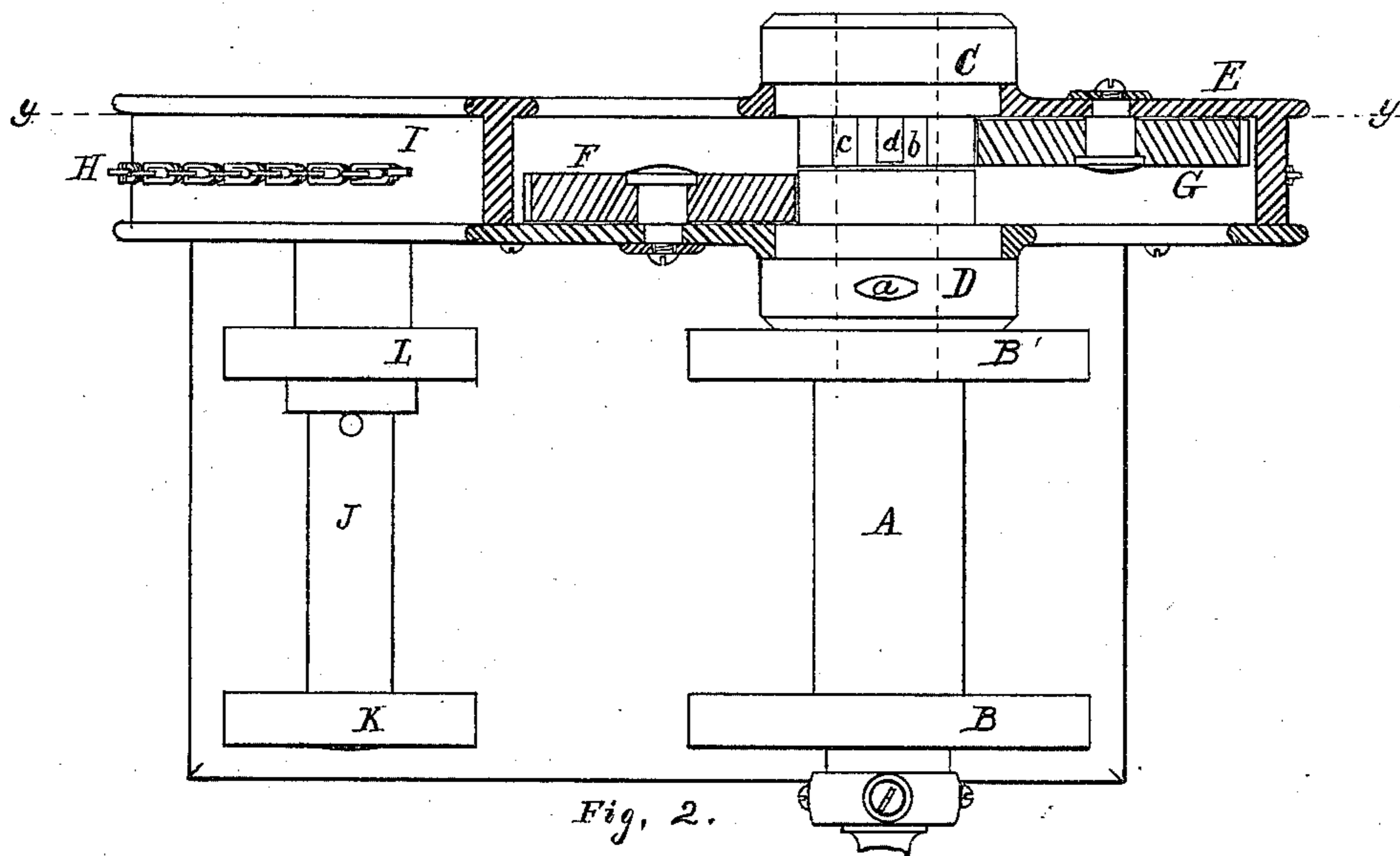


Fig. 2.

Witnesses,
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L. A. True.

Inventor.
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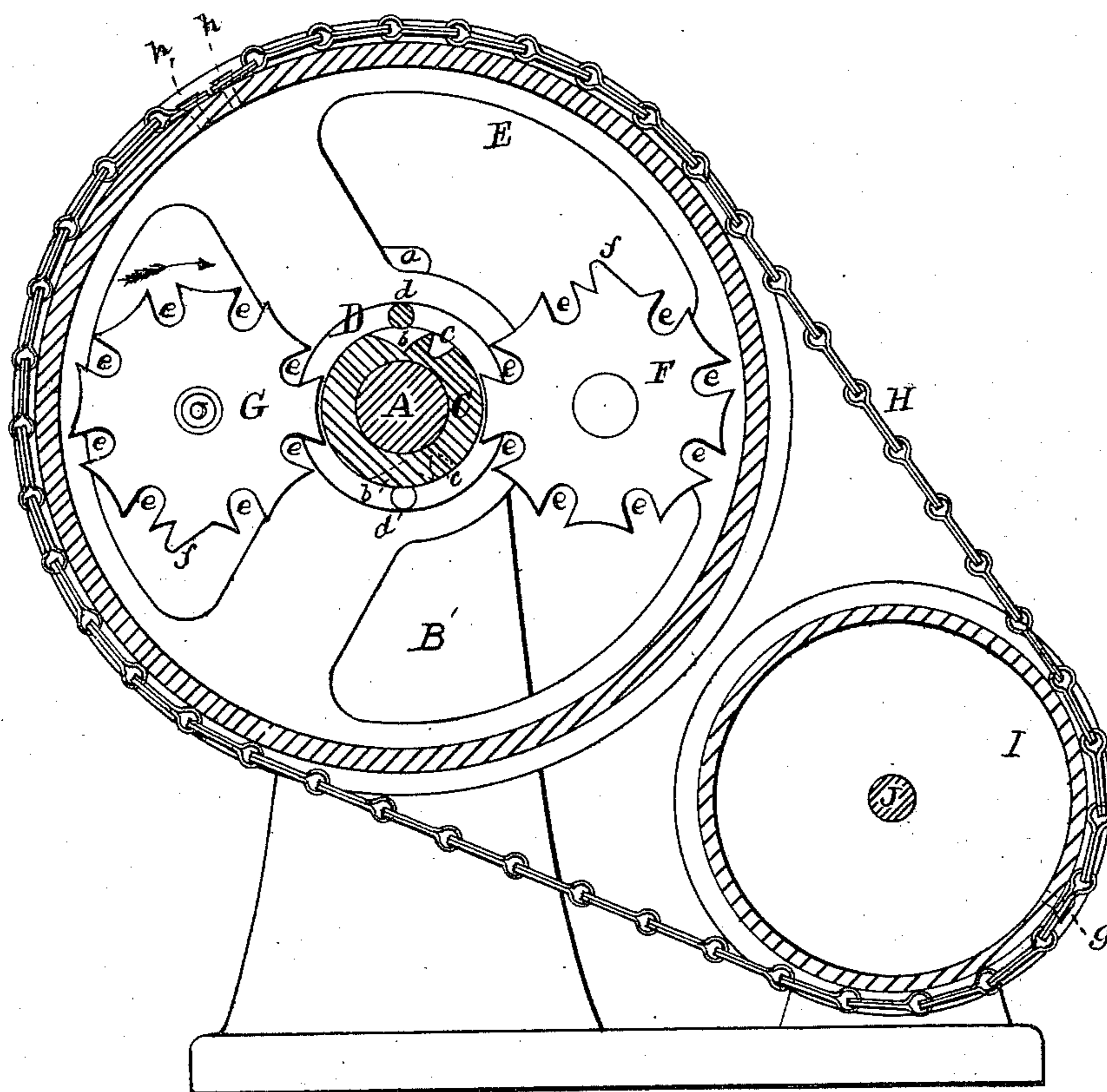


FIG. 3.

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UNITED STATES PATENT OFFICE.

JAMES H. PAINE, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF
HIS RIGHT TO WILLIAM C. CROSS, OF SAME PLACE.

IMPROVEMENT IN STOP MECHANISMS FOR ELEVATORS.

Specification forming part of Letters Patent No. **157,722**, dated December 15, 1874; application filed
May 23, 1874.

To all whom it may concern:

Be it known that I, JAMES H. PAINE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Stop Mechanism for Elevators or Hoisting Apparatus, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to an apparatus for automatically checking the movement of an elevator car or platform, and bringing it to a stand-still at the extreme of its upward and downward movement; and it consists in the employment, in combination with the winding-drum of an elevator or hoisting apparatus, of a drum, pulley, or chain-wheel, mounted loosely upon the shaft of the winding-drum, or some other shaft arranged to revolve in unison therewith, said chain-wheel or pulley having mounted thereon, at a point at one side of its axis, two escapement-wheels, so arranged upon a shaft or studs set in the spokes or arms of said wheel that they may revolve thereon while the chain-wheel is stationary, or be carried around the axis of said chain-wheel when it moves, without being moved upon their studs, each of said escapement-wheels being provided with a series of recesses or notches in its periphery, into which works a pin set in and projecting from a collar secured to the shaft on which said chain-wheel is mounted, said pin moving said escapement-wheel one tooth, or a distance equal to the distance from the center of one recess to the center of the next, to each revolution of said shaft. Said escapement-wheels are also each provided with a tooth of extra length and peculiar form, arranged to engage at the proper time with a notch or recess formed for the purpose in the hub of the collar which carries the pin for moving the escapement-wheel, said tooth and notch serving the purpose of connecting the chain-wheel to the operating-shaft, and compelling it to revolve therewith through a limited space, by which movement the driving-belt is shipped from the tight to a loose pulley by means of a chain or other suitable band or connection from said pulley or chain-wheel to another pulley or wheel mounted upon another shaft connected in any

suitable manner to the shipper, whereby a partial revolution of said secondary shaft shall cause the necessary movement of the shipper-fork. My invention further consists in so mounting the collars which carry the pins for operating the escapement-wheels that they may be adjusted so as to adapt the stop mechanism to the height of the building or the lift of the elevator, as will be described.

In the drawings, Figure 1 is an end elevation of the drum-shaft, shipper-shaft, and the automatic device for operating the latter as arranged to be applied to an elevator. Fig. 2 is a sectional plan, the cutting-plane being on line *x x* on Fig. 1; and Fig. 3 is a vertical section of the same on line *y y* on 2.

A represents a shaft, upon which may be mounted the winding-drum of an elevator, mounted in suitable bearings in the standards B and B'. C and D are two collars and hubs, fitted to one end of the shaft A, and secured thereto by the set-screws *a*, each of said collars being formed with portions of three different diameters, and arranged on the shaft with their smaller ends toward each other, as shown in Fig. 2. The smaller sections of said collars or hubs have formed in their peripheries the notches *b* and *c*, extending across said section parallel to the axis of the shaft; and just above the notch *b* is the pin *d*, projecting from the end of the middle section of each of said hubs, the axis or center line of said pins being parallel to the axis of the shaft A, and of a length equal to the breadth of the smaller section. E is a drum or pulley, provided with two sets of arms and two separate hubs, which are fitted to bear and revolve upon the middle section of the hubs C and D, as shown in Fig. 2. F and G are two escapement-wheels, mounted upon suitable bearings, upon which they may revolve in different planes—that is, one of said wheels being in the same plane with the smaller end of each of the hubs C and D, and in such position that the pin *d* in the hub C will strike into the notches *e* in the wheel F, and the corresponding pin *d* in the hub D will strike into the notches *e* in the wheel G at each revolution of the shaft A, said escapement-wheels being located between the two sets of arms of the wheel or drum E, and

mounted upon studs or other suitable bearings secured to said wheel, as shown. Each of said escapement-wheels is provided with a series of notches or detents, *e*, around its periphery, at equal distances from each other, and also with a tooth, *f*, which, at the proper time, engages with the notch *e*, formed in the periphery of the inner and smaller section of the hub C or D, and, acting as a ratchet and pawl, prevents the revolution of the escapement-wheel about its axis, and thereby causes the wheel or drum E to revolve with the shaft A, and by the action of the chain H, or other suitable connecting-band leading therefrom to the drum I, mounted on the outer end of the shaft J, which is mounted in bearings in the standards K and L, cause said shaft to partially rotate about its axis, which partial rotary motion may be made available to impart the necessary motion to a shipper-fork, and thus transfer the driving-belt from the driving-pulley to the loose pulley, and stop the motion of the car. The number of detents *e* which each escapement-wheel F and G should contain will be determined by the height of the building and the diameter of the winding-drum, or, in other words, by the number of revolutions the winding-drum has to make to raise the car from the bottom to the top of the highest building.

If the travel of the car from its lowest to its highest position, or vice versa, does not require that the winding-drum should make a certain number of complete revolutions, the necessary adjustment of the stop mechanism to adapt it to a fraction of a revolution of the winding-drum may be obtained by loosening the set-screw *a*, that secures one of the hubs C or D to the shaft A, and moving said hub around its shaft and securing it again in the desired position.

If the escapement-wheels are arranged to allow seven revolutions of the winding-drum, and the height of the building only requires five revolutions to raise the car from the bot-

tom to the top, the adjustment may be made by loosening the set-screw *a*, that secures the hub D, and revolving the shaft A till the wheel G has moved two teeth toward the wheel F, in the direction of the arrow, and then tightening said set-screw again, to firmly secure the hub D to the shaft A. The chain H is secured to the drum I by the screws *g*, and to the wheel E by the screws *h h*, or other suitable fastenings, to prevent it from slipping thereon, as shown in Fig. 3.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination with the drum-shaft A, the wheel E, loosely mounted thereon, and having the escapement-wheels F and G, arranged to revolve in different planes upon studs attached to said wheel, each of said escapements being provided with a tooth, *f*, to engage with corresponding notches upon the drum-shaft, and having an intermittent rotary motion imparted to them by pins *d*, attached to the shaft A', all as and for the purpose set forth.

2. The escapement-wheels F and G, each provided with a tooth, *f*, and detents *e*, in combination with the shaft A, provided with the pins *d* and notches *b* and *c*, as and for the purpose specified.

3. The collars C and D, adjustable upon and rigidly secured to the drum-shaft A by the set-screw *a*, and having the pins *d* and notches *b* and *c*, in combination with the escapement-wheels F and G, as and for the purpose set forth.

4. The combination of the shaft A, hubs C D, having pins *d* and notches *b c*, the wheel-escapements F and G, chain H, pulley I, and shaft J, as and for the purpose specified.

Executed at Boston this 20th day of May, 1874.

JAMES H. PAINE.

Witnesses:

N. C. LOMBARD,
S. A. WOOD.