

(No Model.)

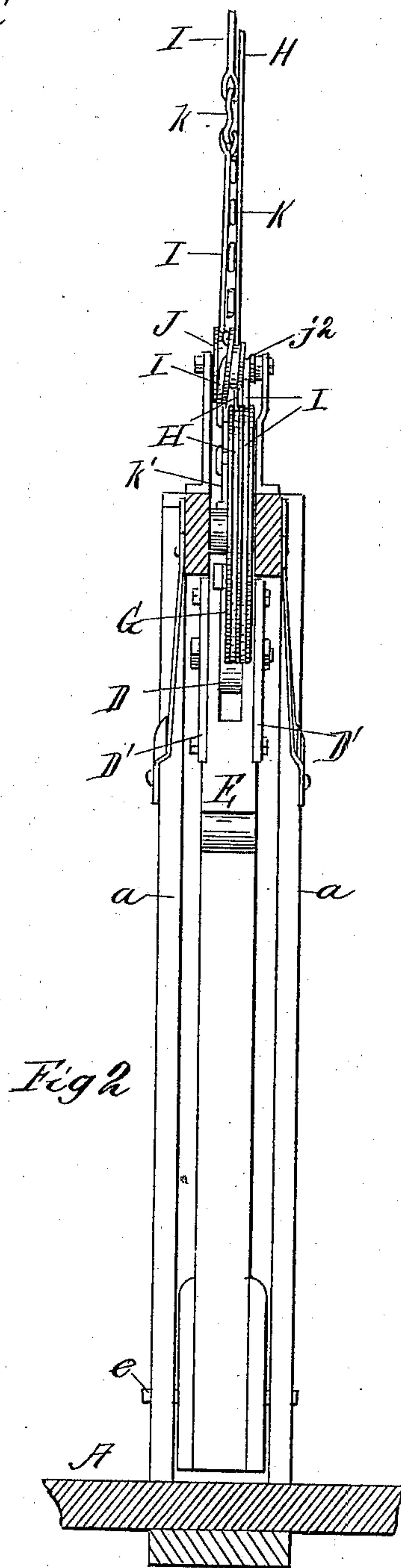
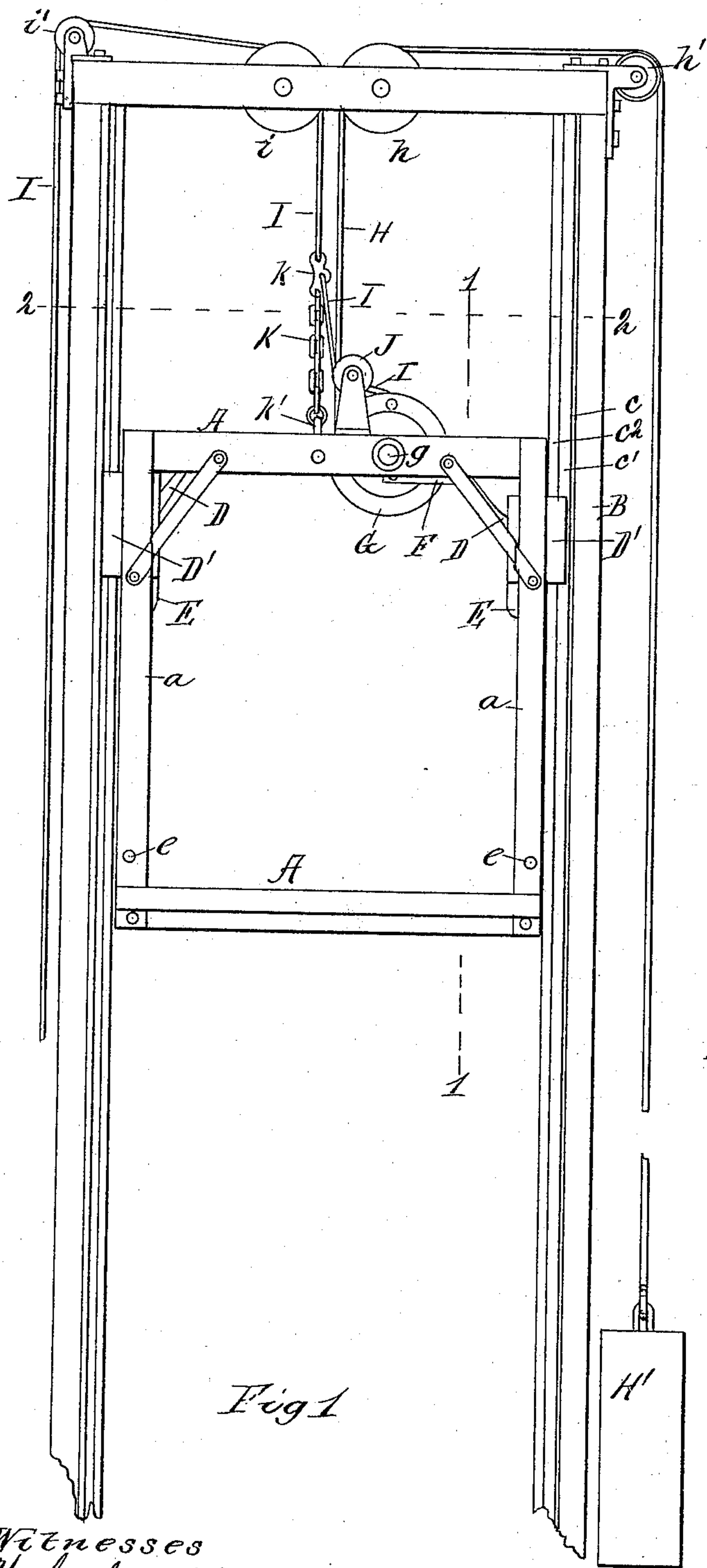
2 Sheets—Sheet 1.

H. OLSEN.

SAFETY DEVICE FOR ELEVATORS.

No. 368,848.

Patented Aug. 23, 1887.



Witnesses  
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Ernie Miller.

Inventor  
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By Edmund Thacher  
Attorneys

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2 Sheets—Sheet 2.

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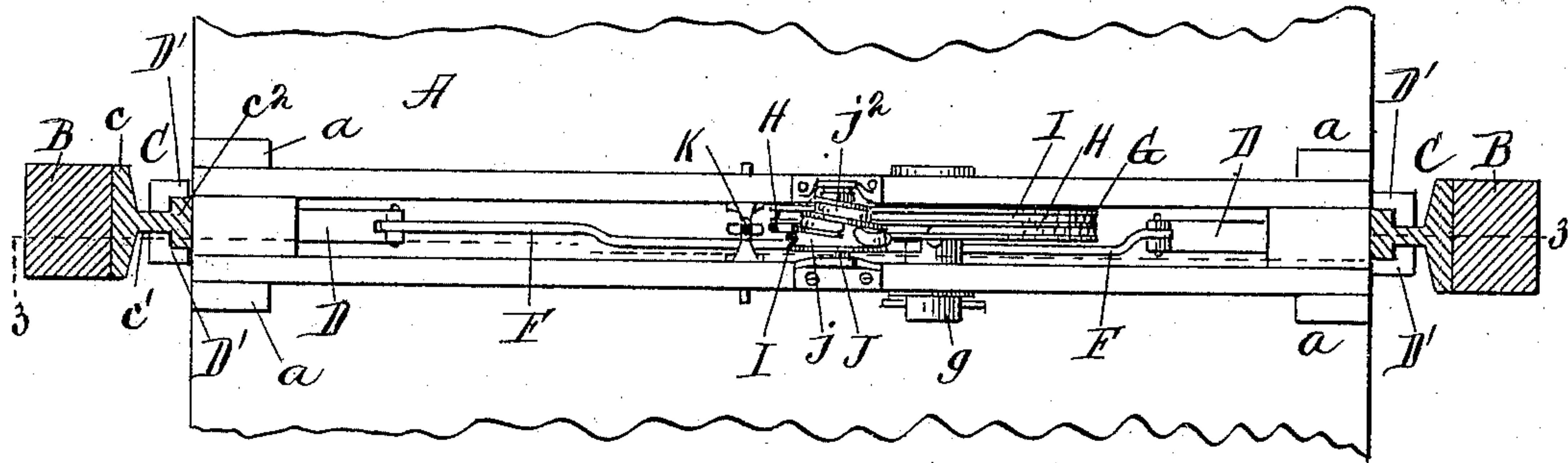


Fig 3

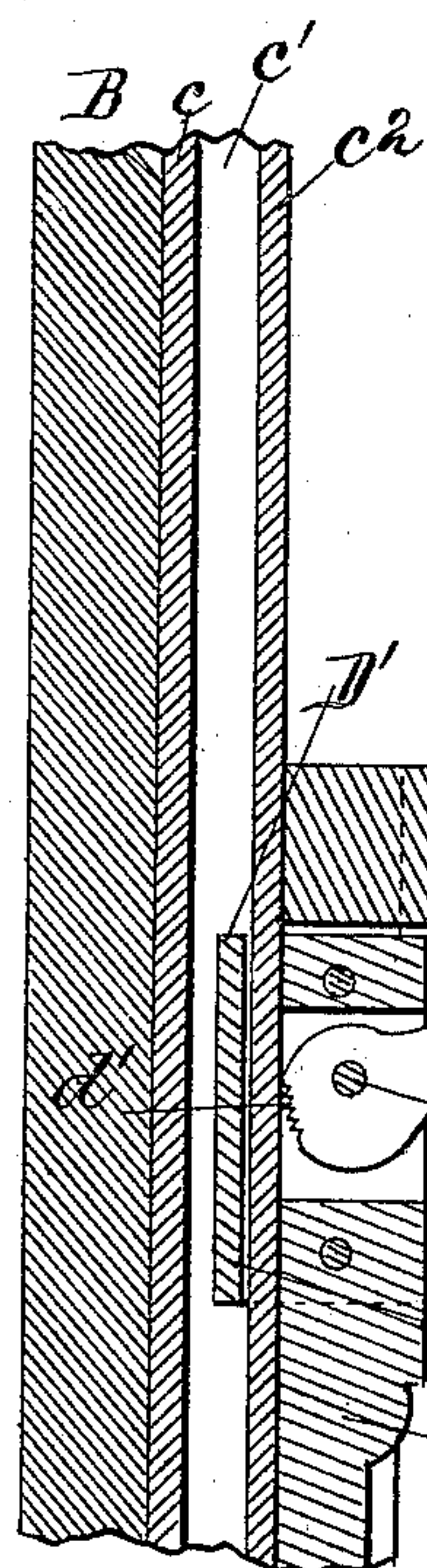


Fig 4

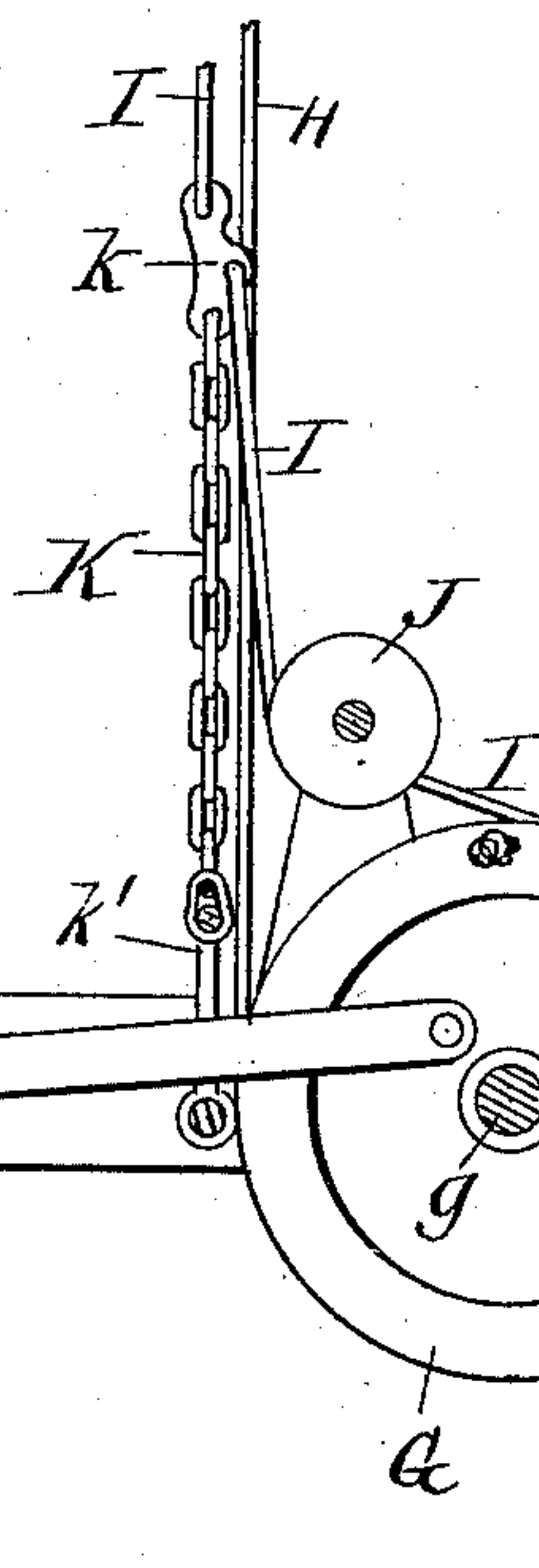


Fig 5

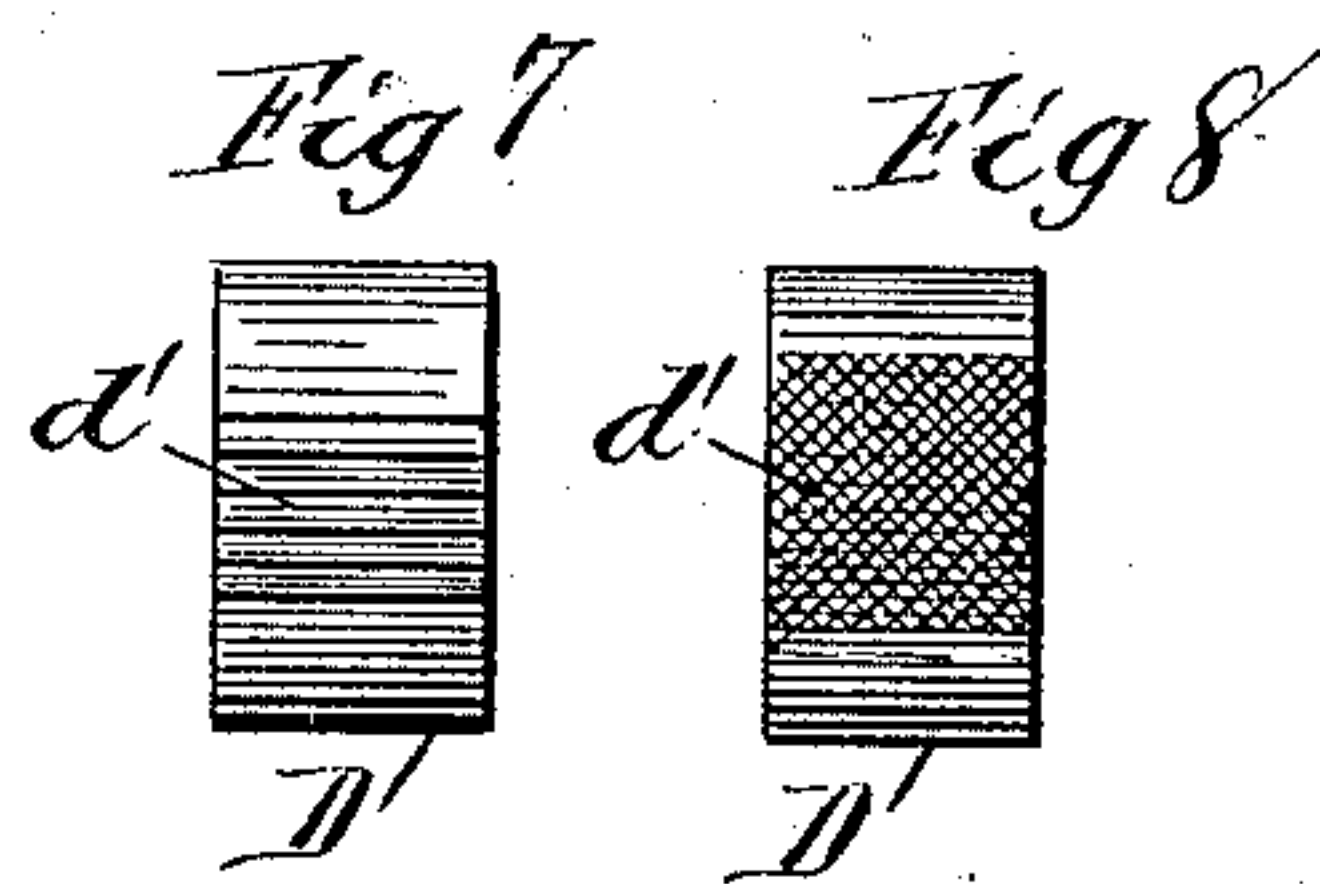


Fig 7

Fig 8

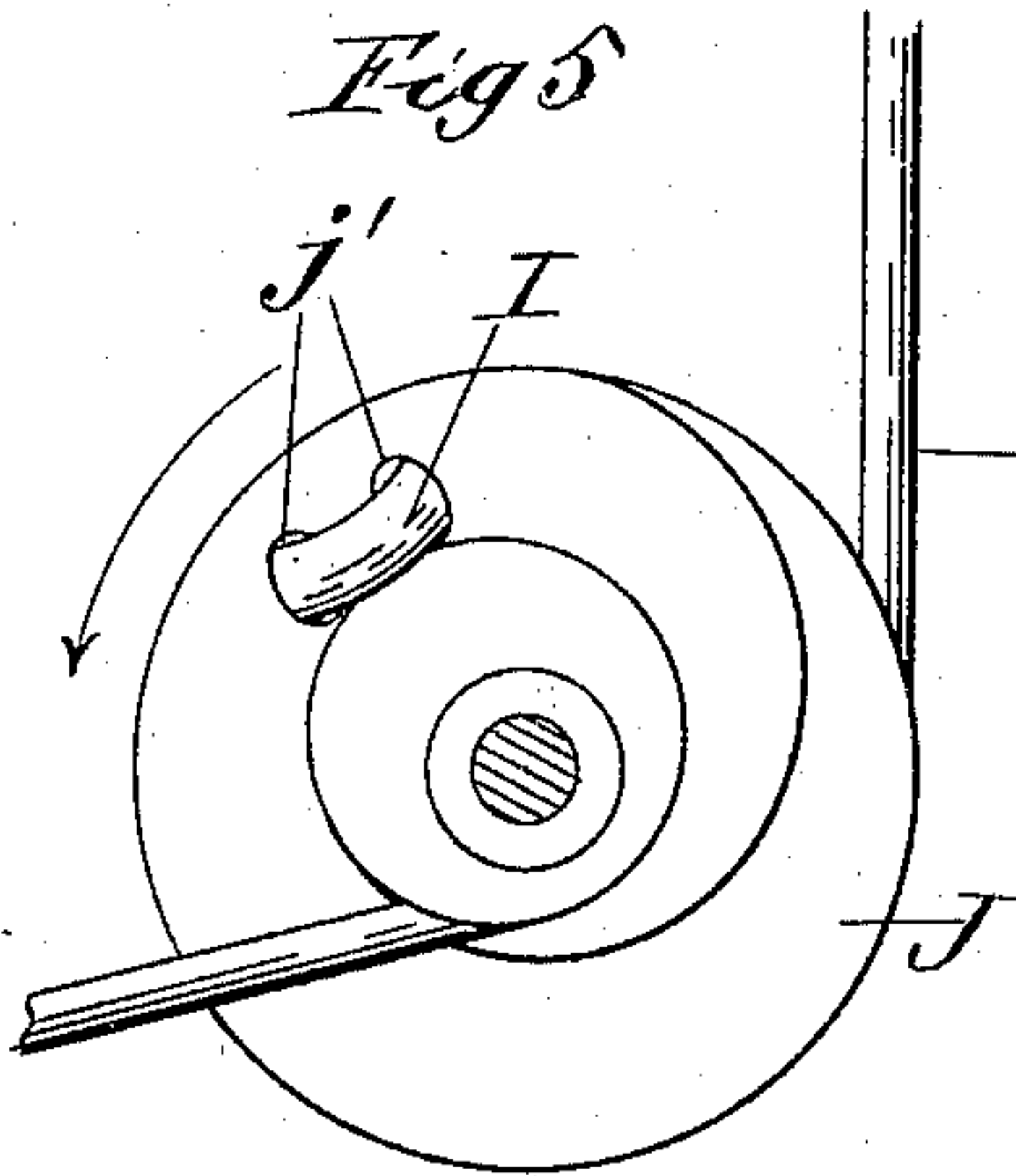
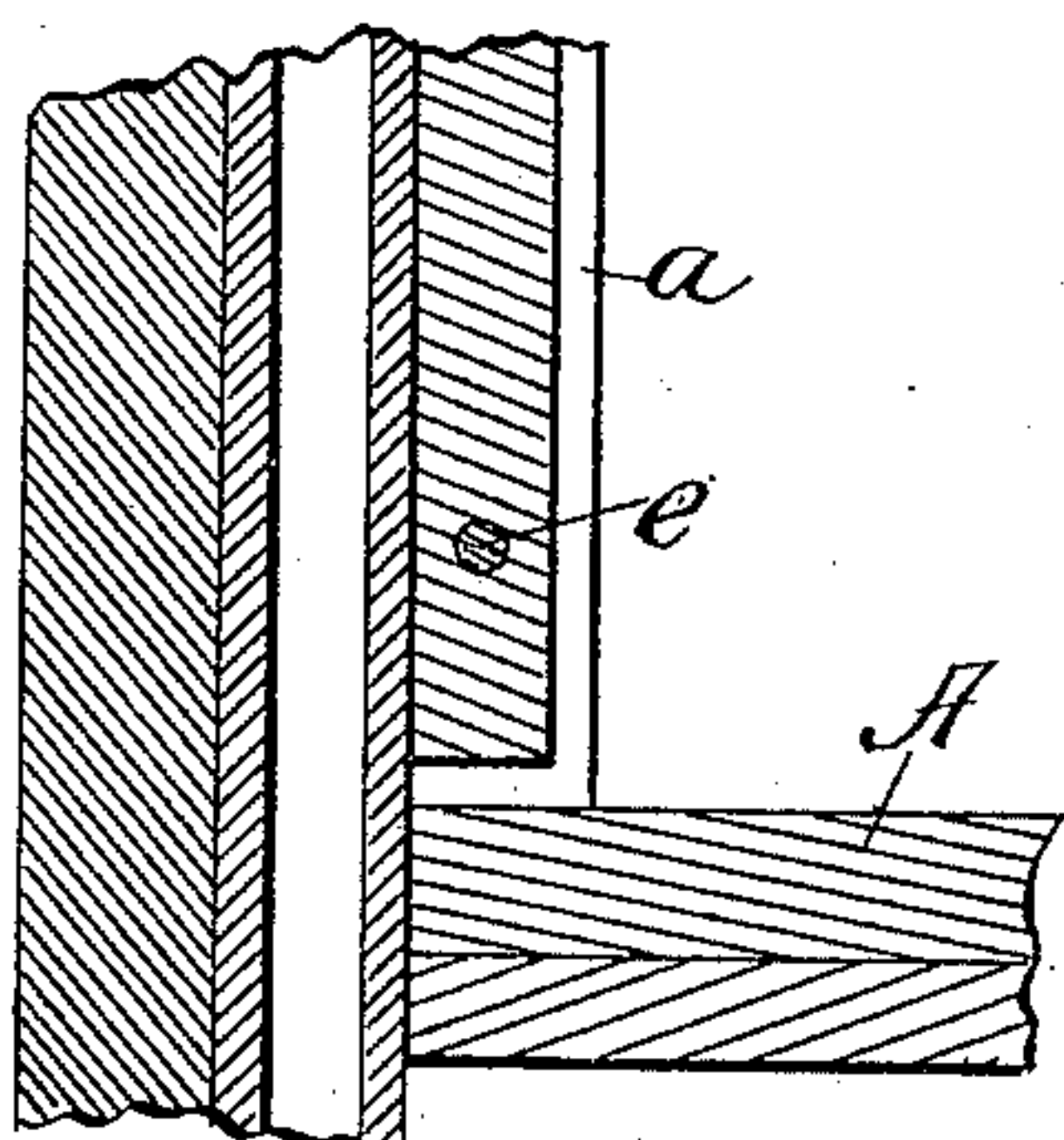


Fig 6

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# UNITED STATES PATENT OFFICE.

HERMAN OLSEN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO  
GEORGE E. P. DODGE, OF SAME PLACE.

## SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 368,848, dated August 23, 1887.

Application filed June 13, 1887. Serial No. 241,227. (No model.)

*To all whom it may concern:*

Be it known that I, HERMAN OLSEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Safety Devices for Elevators, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of an apparatus embodying my invention; Fig. 2, a sectional view of the same, taken on the line 1 1 of Fig. 1; Fig. 3, a plan section taken on the line 2 2 of Fig. 1; Fig. 4, a sectional view taken on the line 3 3 of Fig. 3; Fig. 5, an elevation of the scroll-wheel, viewed from the rear of Fig. 4; Fig. 6, a plan view of the same; Fig. 7, a view of the gripping-surface of the gripping-cam, and Fig. 8 a view of a modified form of the same. Figs. 2, 3, and 4 are on the same scale with respect to each other, but on an enlarged scale with respect to Fig. 1. Figs. 5 to 8, inclusive, are on the same scale with respect to each other, but on a still larger scale than Figs. 2, 3, and 4.

My invention relates to elevators, and has for its object to provide a safety mechanism therefor which shall operate to prevent the descent of the car upon the breakage or slipping of the hoisting-cable; and to these ends my invention consists in certain novel features, which I will now proceed to describe, and will then particularly point out in the claims.

In the drawings, in which I have shown my invention practically carried out in one form, A represents an elevator-car of any suitable construction, arranged to travel between uprights B. These latter are provided with suitable ways, C, consisting, preferably, of a base, *c*, by which they are attached to the uprights B, a web portion, *c'*, at right angles thereto, and a head portion, *c''*, preferably rectangular in cross-section. The car A is provided with gripping cam-levers D, which serve, when in contact with the ways C, to check the movement of the car and hold the same stationary. The gripping cam-levers are preferably mounted in the following manner: Arms E are pivoted at their lower ends, as shown at *e*, be-

tween the uprights *a* at each side of the car, 50 and the cam-levers D are pivoted at or near the upper ends of these arms. Clamping-plates D', L-shaped in horizontal cross-section, as shown more particularly in Fig. 3 of the drawings, are attached to the arms E at their 55 upper ends and embrace the ways C, passing around back of the heads *c''* thereof, as shown. These clamping-pieces are firmly attached to the arms E by bolting them to the sides thereof, as shown, or by securing them thereto in 60 any other suitable manner. The gripping-surfaces of the cam-levers D are preferably provided with a roughened gripping-surface, *d'*, of any suitable construction. In Figs. 4 and 7 this surface is shown as consisting of a num- 65 ber of transverse teeth, while in Fig. 8 a set of diagonal grooves producing a file-like surface is shown. Any other form may be employed, if desired, or the surface may be smooth.

The gripping mechanism just described is one which I have devised and which I prefer to employ; but it is obvious that any other approved form of mechanism for the purpose may be substituted therefor.

The cam-levers D are operated by means of links or pitmen F, pivoted to the inner ends of the said levers and also to a wheel or disk, G, which latter serves to operate the said links, and consequently the cam-levers, through 80 the medium of the hoisting and counterpoise cables. The wheel G is mounted on a suitable shaft, *g*, in the framing of the elevator-car A, and is provided upon its periphery with two grooves, one of which serves to receive the 85 counterpoise-cable H, which is secured to the said wheel, and, passing around the same in one direction, is carried over suitable guide-pulleys, *h* and *h'*.

H' represents a suitable counterpoise secured to the end of the counterpoise-cable H, and being of a weight slightly less than the weight of the unloaded car A.

I represents the hoisting-cable, one end of which is led to any approved form of hoisting 95 apparatus. This cable passes over suitable guide-pulleys, *i* and *i'*, and thence to the wheel G, around which it passes in a direction the



reverse of that of the counterpoise-cable H, its end being secured to the said wheel.

J represents a wheel around which the hoisting-cable I passes before reaching the wheel

5 G. This wheel J may be an ordinary idle wheel or pulley, but preferably I construct it in the manner shown more particularly in Figs. 5 and 6 of the drawings, in which the hoisting-cable I is first passed around a circular portion, *j*, of the said wheel, and being then secured thereto by passing a loop of the said cable through suitable apertures in the flange of the said wheel, as shown at *j'*, the cable I then passes around a scroll shaped portion, *j''*, from which it leads to the wheel G.

15 K represents a bridle or check, preferably composed of a section of chain, or other extremely flexible connection, its upper end being connected to the hoisting-cable I above the wheel J, while its lower end is connected to the elevator-car A. In practice a link, *k*, is employed on the hoisting-cable I to form a connection for the bridle-chain K, and the car A is provided with a pivoted link, *k'*, to which 25 the lower end of the bridle-chain K is connected, these details being shown more particularly in Fig. 4 of the drawings.

The operation of my improved safety device is as follows: As long as the hoisting-cable 30 I is held, either by the hoisting apparatus or by any other means, so as to support the weight of the car A the parts will be retained in substantially the position shown. The weight of the car A being greater than that of the counterpoise, its downward pull will raise the 35 counterpoise, the rotation of the wheel G permitting this lifting of the counterpoise, and at the same time this rotation will throw the gripping-levers inward clear of the ways. The 40 bridle K will of course act as a check on the rotation of the wheel G, since, when the parts are in the position shown, the car will be principally supported by the said bridle-chain and the cable I will not rotate the wheel G farther 45 than is permitted by the said bridle-chain. This being the case, it is obvious that by means of the hoisting-cable I the car A, whether empty or loaded, may be raised and lowered in the usual manner, just as though the said 50 cable were connected directly to the car. If, however, the hoisting-cable I is broken or cut, or slips from the hoisting mechanism, or, in fact, is caused to slack up suddenly for any reason whatsoever, there is then no opposition 55 to the pull of the counterpoise H' through the medium of the counterpoise-cable H upon the wheel G. This wheel will therefore be rotated in such a manner as to draw the links F inward, and consequently throw the gripping cam- 60 levers D outward, causing them to engage with the ways C. At the same time the action of these cams upon the ways will vibrate the arms E upon their pivots *e* and will draw the clamping-plates D' against the back of the 65 heads *c'* of the ways C. This operation serves to clamp the car firmly to the ways and posi-

tively prevent any further descent of the same.

Moreover, the heavier the load upon the car the quicker will this locking action take place and the more firmly will the car be held in its 70 locked position. The car may be readily released by an upward pull upon the hoisting-cable I, which will rotate the wheel G in the reverse direction and release the gripping mechanism.

As hereinbefore stated, I prefer to construct 75 the bridle K of chain or other like material, since this slacks more readily and offers no obstacle to the operation of the gripping mechanism. I also prefer to construct the wheel J 80 in the manner shown for a somewhat similar reason, since by its means the slack of the hoisting-cable I above the said wheel will be wound up more rapidly during the rotation of the wheel G through the medium of the coun- 85 terpoise H'. These parts may, however, be otherwise constructed, if desired, and various other modifications in the details of construction will readily suggest themselves. I therefore do not wish to be understood as limiting 90 myself strictly to the precise details hereinbefore described, and shown in the drawings.

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

95 1. The combination, with the elevator-car provided with gripping mechanism and a counterpoise of less weight, of a wheel mounted on the car and connected to the gripping mechanism to operate the same, and the hoisting 100 and counterpoise cables passing around said wheel in opposite directions, substantially as and for the purposes specified.

2. The combination, with the elevator-car 105 provided with gripping mechanism and a counterpoise of less weight, of a wheel mounted on the car and connected to the gripping mechanism to operate the same, the hoisting and counterpoise cables passing around said wheel in opposite directions, and a bridle connected 110 to the hoisting-cable and to the car, substantially as and for the purposes specified.

3. The combination, with the elevator-car 115 provided with gripping mechanism and with a wheel to operate the same, of a counterpoise of less weight, having its cable attached to and passing around the said wheel in one direction, and a hoisting-cable attached to and passing around the said wheel in the opposite direc- 120 tion, said hoisting-cable also passing around a suitable guiding and supporting wheel above the grip-operating wheel, substantially as and for the purposes specified.

4. The combination, with the elevator-car 125 provided with gripping mechanism and a wheel for operating the same, of the counterpoise having its cable attached to and passing around the said wheel in one direction, the hoisting-cable, also attached to said wheel and passing around the same in the opposite direction, and 130 the guiding-wheel J, having circular portion *j* and scroll portion *j'* to receive the hoisting-



cable I, substantially as and for the purposes specified.

5 5. In an elevator, the combination, with the car and the ways on which it travels, of the wheel G, having the counterpoise and hoisting cables connected thereto, as described, the gripping cam-levers D, for engaging the ways, and the links or pitmen F, connecting the said cam-levers with the wheel G, substantially as  
10 and for the purposes specified.

6. The combination, with the elevator-car A and the ways C, having heads  $c^2$ , of the upright arms E, pivoted to the car at one end

and carrying the clamping-pieces D' at their other ends, the cam-levers D, pivoted to said 15 arms and adapted to bear against the ways C, and the wheel G, suitably connected to said cam-levers to operate the same and having the hoisting and counterpoise cables connected to it, as described, substantially as and for the 20 purposes specified.

HERMAN OLSEN.

Witnesses:

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F. L. WELLNER.