

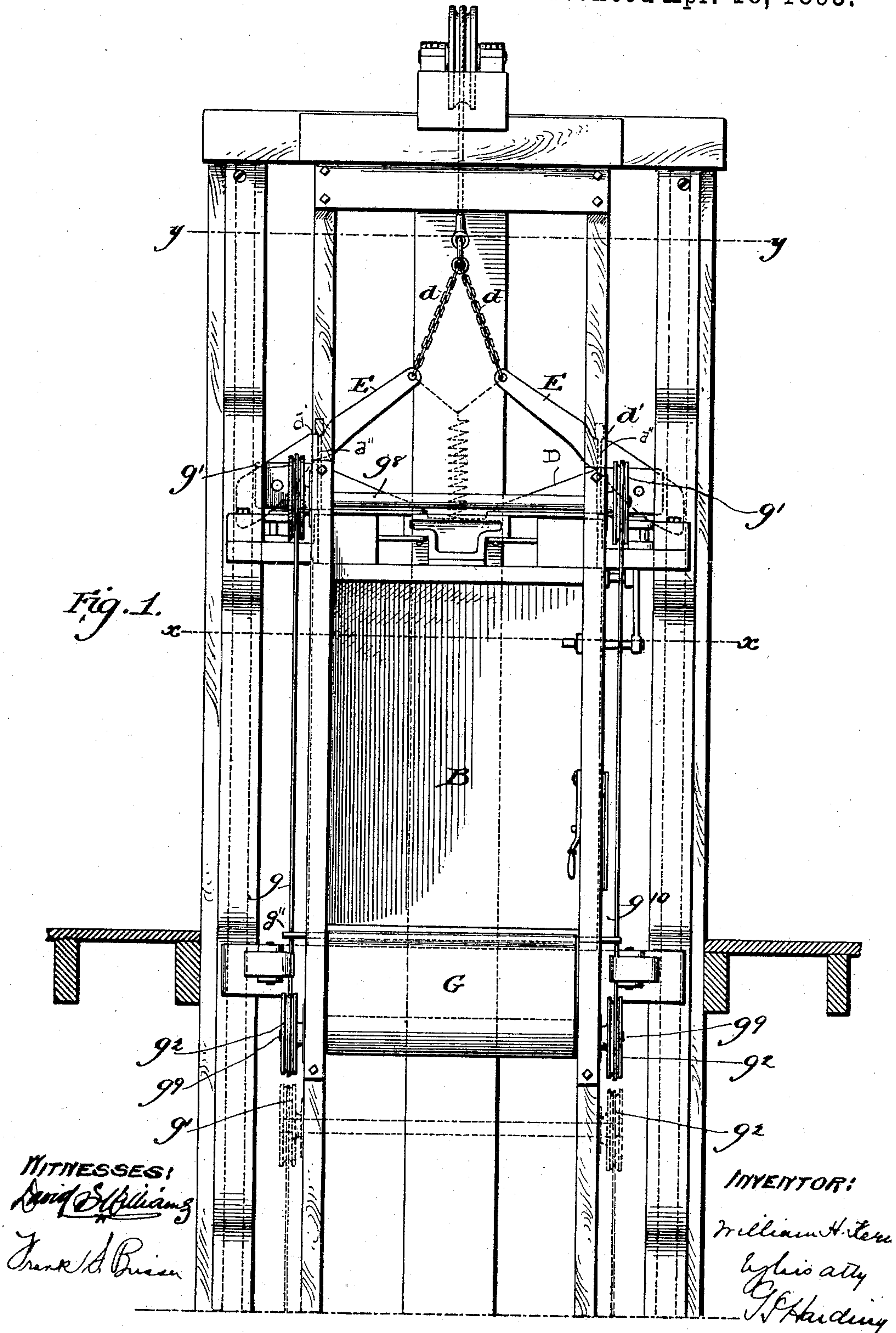
(No Model.)

5 Sheets—Sheet 1.

W. H. KERN.
ELEVATOR.

No. 495,554.

Patented Apr. 18, 1893.



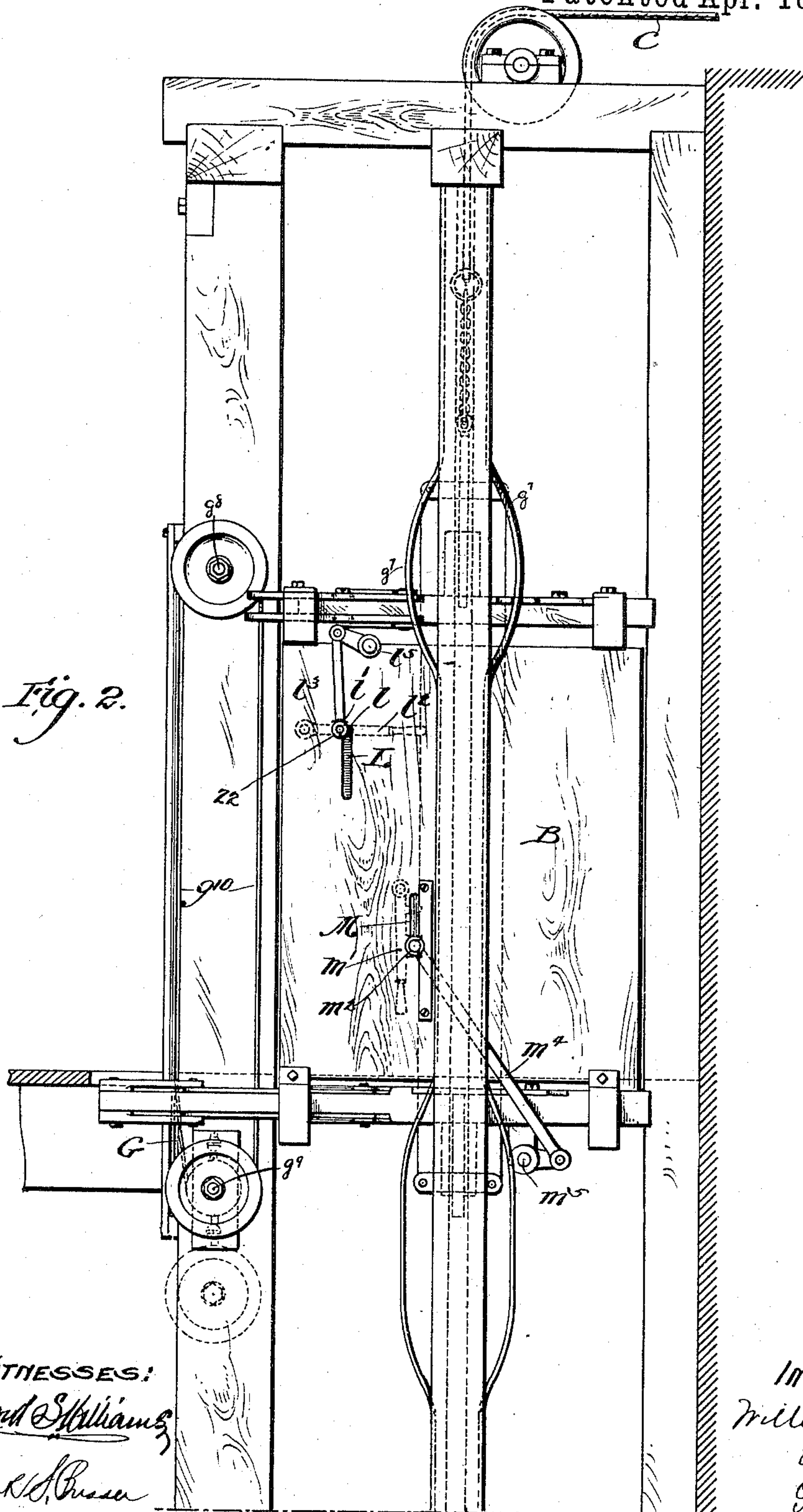
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W. H. KERN.
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No. 495,554.

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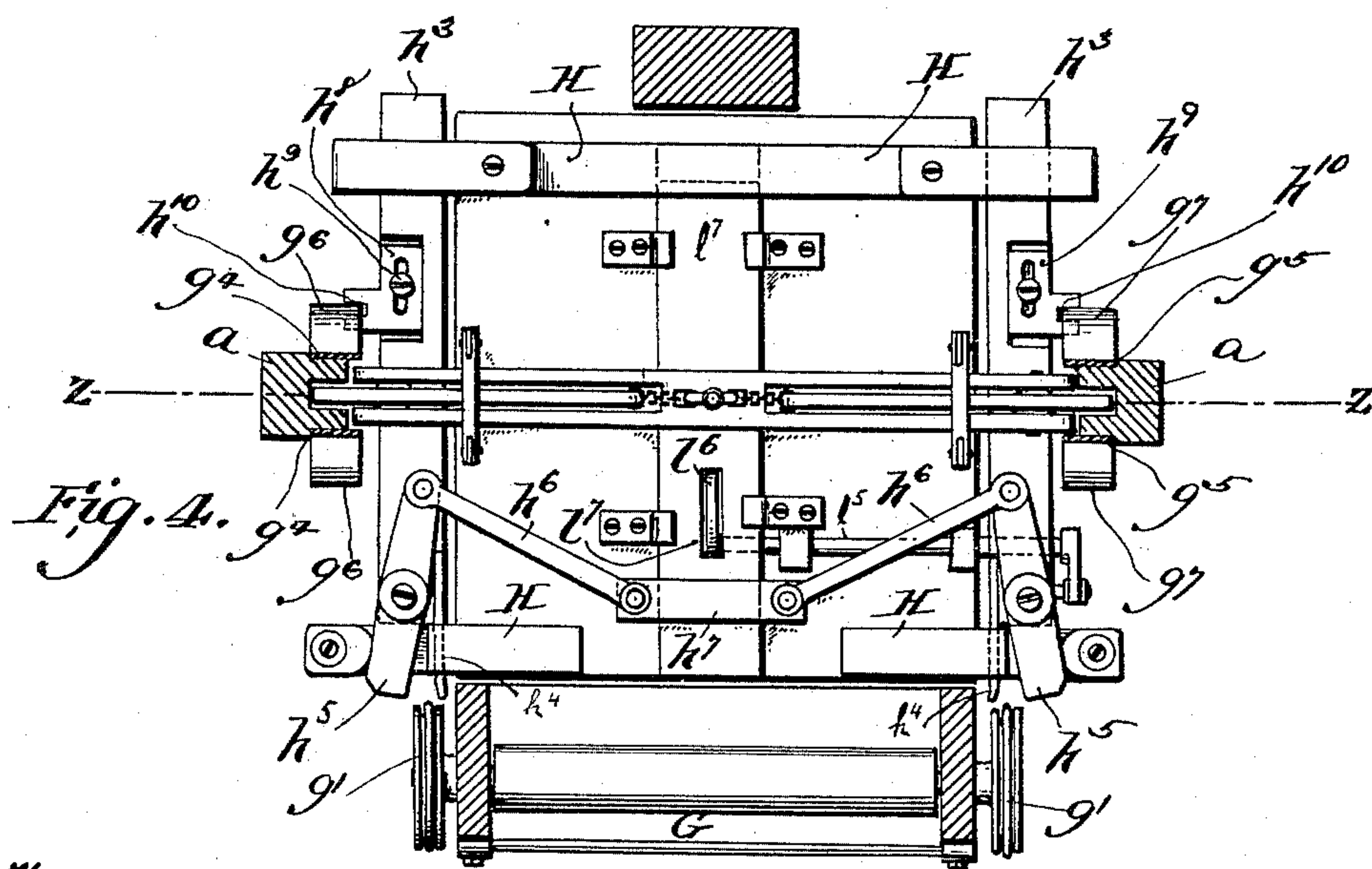
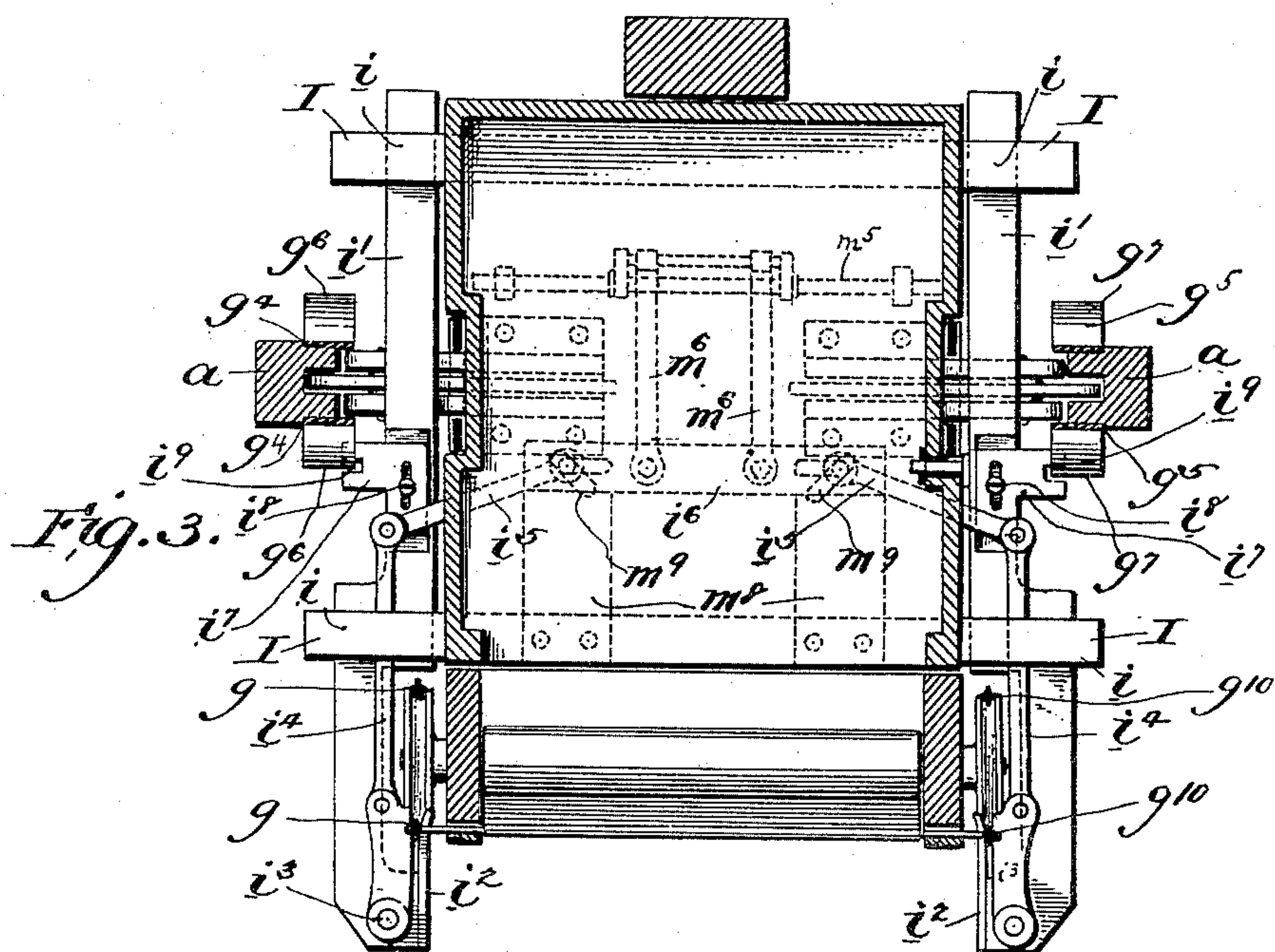
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WITNESSES:

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INVENTOR:

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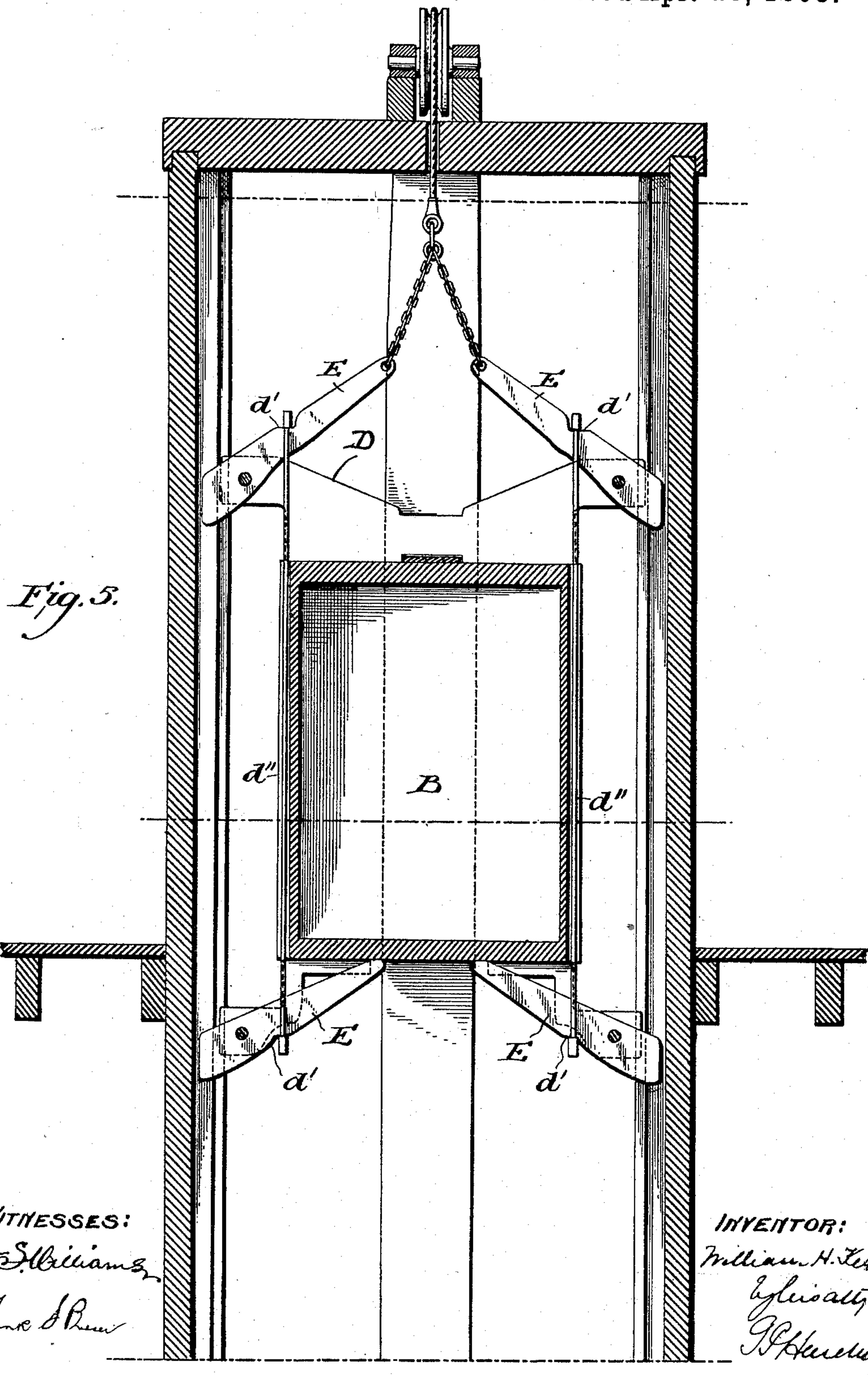
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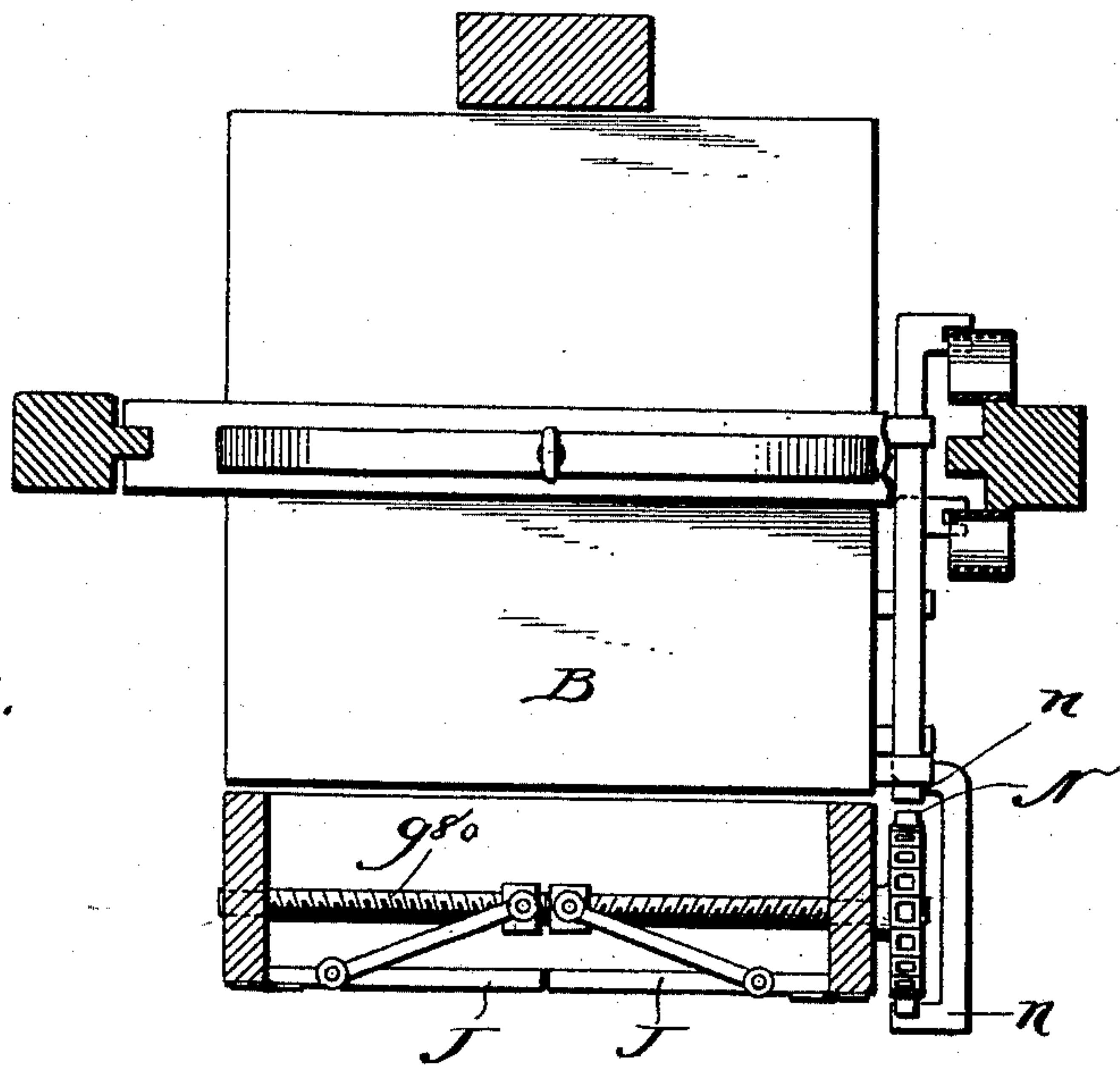
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Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM H. KERN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WILSON H. EBERT, OF SAME PLACE.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 495,554, dated April 18, 1893.

Application filed July 7, 1892. Serial No. 439,228. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. KERN, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Elevators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object certain improved construction whereby the safety of the elevator is secured in case of the breaking of the lifting cables; also that in certain arrangements whereby each floor is provided with an open door, a curtain is arranged in addition to the door, which curtain is automatically drawn down as the elevator approaches and returned after the elevator has passed; also in mechanism for operating the doors automatically by the moving elevator; also in other improvements hereinafter particularly described.

I will first describe my preferred form of embodiment of my invention.

In the drawings—Figure 1 is a front elevation of my improved elevator. Fig. 2 is a side elevation. Fig. 3 is a section on line $x-x$ of Fig. 1. Fig. 4 is a section on line $y-y$ of Fig. 1. Fig. 5 is a section on line $z-z$, Fig. 4. Fig. 6 is a plan view of the device, somewhat modified.

A is the elevator wall having the guide posts or frames a . This wall should be constructed so as to be fire proof or as nearly so as possible.

B is the elevator car and C the lifting cable (there may be any number of cables desired).

D—D are frames secured to the top and bottom of the car, and pivoted in these frames on each side, top and bottom, are the levers E, E. These levers are fastened or pivoted so that the pivoted point is close to one end of the lever, the end adjacent to the guides; the other ends of the levers secured to the frame in the upper portion of the car, being secured to the lifting cable or cables by the chains d , d .

d' , d' , are notches in each of the levers E,

both upon the top and bottom of the elevator car, and d'' are metallic straps or links which connect the lever E on top of the car with the corresponding levers on the bottom of the car and rest in said notches. The free ends of said levers are in such positions that when they are attached to the lifting cable or cables, the weight of the elevator will hold said levers out of contact with the guides; but when the cable is released from the levers, the long ends drop, bringing the short ends in contact with the guide and preventing the falling of the elevator.

The chains g , g^{10} , run upon the wheels g' , g' , g^2 , g^2 , the wheels g' , g' , and g^2 , g^2 , being about the height of the elevator entrance door on each floor, and wheels g' , g' , being connected together by shaft g^8 , and g^2 , g^2 , being connected together by shaft g^9 . Around the shaft g^9 passes the curtain G, which is fastened to the rod g^{11} which engages one of the links of the chains, and I operate the chains in the following manner: Attached to the frames a are the tracks g^4 , g^5 , having bowed portions g^6 , g^7 .

H, H, are two beams secured to the top of the car, slotted as shown, and cross-pieces h^3 one on each side and a sliding plate h^7 , whose function will be hereinafter described, pass through said slots. At the end of these pieces h^3 are two jaws h^4 , h^5 . The jaws h^4 are rigidly secured to said cross-pieces h^3 . The jaws h^5 are pivotally connected to said cross-pieces and in turn are connected to links h^6 , which links are one each side of and pivotally connected to a block h^7 . Upon the cross-pieces h^3 is a metal plate h^8 , adjustably secured to said pieces h^3 by screws h^9 which pass through a slot in said plates h^8 and into said cross pieces. In these plates h^8 , h^8 are the notches h^{10} , h^{10} with which the tracks g^4 , g^5 engage (see Fig. 4).

Upon the lower portion of the car are beams I, secured to the bottom of the car and slotted as shown at i , and a cross piece i' , one on each side passing through said slots. At the end of these pieces i' are two jaws i^2 , i^3 , the jaws i^2 being rigidly secured to said cross-pieces, while the jaws i^3 are pivoted to the links i^4 which in turn are pivoted to the cross

pieces i' , and these links i^4 are in turn pivoted to the links i^5 , the ends of which links are secured in the slotted ends of plate i^6 . Upon the cross pieces i' are the metal plates i^7 , adj-
 5 justably secured to said cross pieces by means of screws i^8 which pass through slots in said plates and into cross pieces. In these plates i^7 are the notches i^9 in which the tracks $g^4 g^5$ rest. (See Fig. 3.) When the elevator is be-
 10 ing operated downward the notches in the plates i^7 travel in the tracks $g^5 g^4$. The jaws $i^2 i^3$ are close to each other and in line with the outer part of the chains $g g^{10}$, so that when it reaches said chain it grips it, carrying it
 15 and rolling up the curtain, and when the notches in plates i^7 move over the bowed portions the plates travel outward carrying with them the pieces i' . Each of the links i^5 being pivoted to its crosspiece i' , the movement
 20 of the crosspiece will move the link i^5 in the same direction. The pin in said link of course moves in the slot in the rigid plate m^8 , thus throwing the link i^4 outward and moving the jaw i^3 (to which the link i^4 is rigidly con-
 25 nected) away from the fixed jaw i^2 , bringing the jaws out of line with the chains and moving the movable jaw away from the fixed jaw and thus releasing the jaws from the chain and bringing them to a position away from
 30 the chain and wheels. This bowed portion is in such position that the jaws are released when the curtain is rolled up; similarly the jaws h^4 and h^5 are normally in position to grip the chains g, g^{10} on the side opposite to
 35 that which the jaws i^2, i^3 grip, and when they approach the chains, their action is opposite to that of the jaws i^2, i^3 , to-wit: unfolding the curtain, and when the notches h^{10} of plates h^9 pass over the bowed portions of
 40 tracks $g^4 g^5$, the plates move outward, carrying the pieces h^3 and bringing the jaws out of line of the chains and moving the movable jaw away from the fixed jaw. This occurs
 45 before the elevator has proceeded downward a distance sufficient to pass beyond the landing. In going upward the operation is reversed, as is evident, the jaws h^4 , and h^5 rolling up the curtain, while the jaws i^2, i^3 , unroll the same. Thus, by this construction, I can
 50 provide a curtain at each landing, and as the elevator approaches it, it will be wound up, and as the elevator passes beyond it, it will be unwound.

It may be desirable to provide, besides the
 55 door for closing the car opening, an independent door or doors for closing the well opening. In the drawings, Fig. 6, I show the hinged doors J, J. These doors may be made to slide, if desired. Their mode of operation is as fol-
 60 lows: The shaft g^{80} is threaded in opposite directions from the center (Fig. 6), and right and left nuts j, j' , work in said threaded portions. These nuts are connected with the hinged doors, J, of the landing, so that by the
 65 mechanism hereinbefore described, I can not

only roll and unroll the curtain, but also open the door.

In some cases it may be advisable or necessary to move up and down without the jaws acting; such, for instance, as in case of fire 70 on one floor, and persons are being carried from the floor above downward. I accomplish this in the following manner—I operate the jaws, h^3, h^4 , as follows: Inside the car is the slot L, with an inset l , in which rests 75 the arm l' , shown in section. Beyond where this arm rests in said inset, it is bent so as to form a recess for the reception of the arm l^2 , which, when in the position shown in the drawings, prevents the arm l' from moving 80 out of the slot inset. The arm l^2 normally engages with the inset l , and the lever l^2 engages with the arm l' to hold it in its normal position in the in-set; and when it is desired to move the jaws h^5 the operator disengages the 85 lever l^2 and grasps the arm l' to move it to the bottom of slot L. When it is desired to operate it for the purpose above set out, the guard is moved away, and the arm moved out of the in-
 90 set and downward in the slot. Connected to this arm l' is the link l^3 , which is connected to the crank of the shaft l^5 . On this shaft is the eccentric l^6 , which works in a slot in the plate l^7 , secured to the top of the elevator so as to slide, and to this plate l^7 the block h^7 is se- 95 cured. When the arm l' is moved downward, it moves this eccentric, which in turn moves the block and thereby moving the jaw h^5 .

The jaws i^2, i^3 , are operated in the follow-
 100 ing manner; when it is desired to hold them open—M is a slot in the elevator. m^2 is an arm in said slot and is shown in section. The arm m' is provided with a notched projection, in which the arm m^2 rests and is firmly held
 105 from moving. Connected to the arm m^2 is the link m^4 , which is connected to a crank arm of the shaft m^5 . m^6, m^6 , are links connecting shaft m^5 and plate i^6 . At the end of each of said links is a pin which passes
 110 through a slot in the movable plate i^6 and a slot in the fixed plate m^8 , so that when arm m' is moved, it causes the links i^4 (which are rigidly connected with jaws i^3) to swing out-
 115 ward on their pivot points, and thus the jaws are separated from each other and brought out of alignment with the chain. In place of the jaws I can use lugs N placed upon the chain, using then a sprocket chain having
 120 projections n from the cross-pieces, which are in line of movement with said lugs (see Fig. 6).

Having now fully described my invention, what I claim is—

1. In an elevator, in combination, a car, a curtain, chains to which said curtain is connected, wheels over which said chains pass, 125 cross-pieces connected to the top of the car and adapted to have a movement, devices upon said pieces adapted to engage said chains, and a cam way substantially as described to give a movement to said cross-pieces. 130

2. In an elevator, in combination, a car, a curtain, chains to which said curtain is connected, wheels over which said chains pass, cross pieces connected to the top of the car, and adapted to have a movement, jaws at one end of said pieces, in line with said chains, and a cam way substantially as described to give a movement to said cross pieces and open and close said jaws.

3. In an elevator, in combination, a car, a curtain, chains to which said curtain is connected, wheels over which said chains pass, cross pieces connected to the bottom of the car and adapted to have a movement, jaws at one end of said pieces in line with said chain, and a cam way substantially as described, to give a movement to said cross pieces and open and close said jaws.

4. In an elevator, in combination, a car, a curtain, chains to which said curtain is connected, wheels over which said chains pass, cross pieces connected to the top of the car and adapted to have a movement, tracks as g^4, g^5 , provided with bowed portions as g^6, g^7 , plates secured to said cross pieces and provided with insets engaging said tracks, jaws at one end of said cross pieces, and mechanism substantially as described to open and close said jaws when said cross pieces are moved.

5. In an elevator, in combination, a car, a curtain, chains to which said curtain is connected, wheels over which said chains pass, cross pieces connected to the bottom of the car, and adapted to have a movement, tracks as g^4, g^5 provided with bowed portions as g^6, g^7 , plates secured to said cross pieces and provided with insets engaging said tracks, jaws at one end of said cross pieces and mechanism substantially as described to open and close said jaws when said cross pieces are moved.

6. In an elevator, in combination, a car, a curtain, chains to which said curtain is connected, wheels over which said chains pass, cross pieces connected to the car and adapted to have a movement, jaws at one end of said pieces in line with said chains, and means substantially as described to give a movement to said cross pieces, one of said jaws being fixedly connected to its cross piece, the other pivotally connected to its cross piece, a block and intermediate connection between said block and movable jaw.

7. In an elevator, in combination, a car, a curtain chains to which said curtain is connected, wheels over which said chains pass, cross pieces connected to the bottom of the car and adapted to have a movement, jaws at one end of said pieces in line with said chain, and means substantially as described to give a movement to said cross pieces, one of said jaws being fixedly connected to its cross piece, a link to which the other jaw is pivoted, said links being pivoted to the cross piece, and a

plate provided with a slot, said link being connected to said plate by a pin and passing through said slot.

8. In an elevator, in combination, a car, a curtain, chains to which said curtain is connected, wheels over which said chains pass, cross pieces connected to the car and adapted to have a movement, tracks as g^4, g^5 provided with bowed portions, as g^6, g^7 , plates provided with an inset in which said tracks rest secured to each cross piece, jaws at one end of said cross piece, one of its jaws being fixedly connected to said cross piece, the other pivotally connected to its cross piece, links to which said movable jaws are connected, and a block to which said links are pivotally connected.

9. In an elevator, in combination, a car, a curtain, chains to which said curtain is connected, wheels over which said chains pass, cross pieces connected to the car, and adapted to have a movement, tracks as g^4 provided with bowed portions as g^6 , plates provided with an inset in which said tracks rest, secured to said cross piece, jaws at one end of said cross piece, one of said jaws being fixedly connected to said cross piece, a link to which the other jaw is pivoted, said link being pivoted to the cross piece, a plate provided with a slot, said link being connected to said plate by a pin passing through said slot.

10. In an elevator, in combination, a car, a curtain, chains to which said curtain is connected, wheels over which said chains pass, cross pieces connected to the car and adapted to have a movement, jaws at one end of said pieces in line with said chains, and means substantially as described to give a movement to said cross pieces, one of said jaws being fixedly connected to its cross piece, the other pivotally connected to said cross piece, links to which said movable jaw is connected, a block, to which said link is pivotally connected, a slot in the car, an arm adapted to work in said slot, a link connected to said arm, a shaft provided with a crank to which said link is connected, an eccentric on said shaft, a plate to which said block is connected, said plate being adapted to slide and provided with a slot, in which said eccentric works.

11. In an elevator, in combination, a car, a curtain chains to which said curtain is connected, wheels over which said chains pass, cross pieces connected to the car and adapted to have a movement, jaws at one end of said pieces in line with said chain, and means substantially as described to give a movement to said cross pieces, one of said jaws being fixedly connected to its cross piece, a link to which the other jaw is pivoted, said link being pivoted to the cross piece, a slot in the car, an arm in said slot, a link connected to said arm, a shaft to which said link is connected, a plate as z^6 , links connecting said shaft and plate and connection substantially

as described between said plate and the link pivoted to the cross piece.

12. In an elevator, in combination, a car, a device for closing the well opening, a wheel, and a chain passing around it, means for connecting said device with the wheel and chain, cross pieces connected to the top of the car and adapted to have a movement, devices upon said pieces adapted to engage said

chain, and a cam way substantially as described to give a movement to said cross pieces.

In testimony of which invention I have hereunto set my hand.

WILLIAM H. KERN.

Witnesses:

GEO. W. REED,

FRANK S. BUSSE.