

No. 622,945.

Patented Apr. 11, 1899.

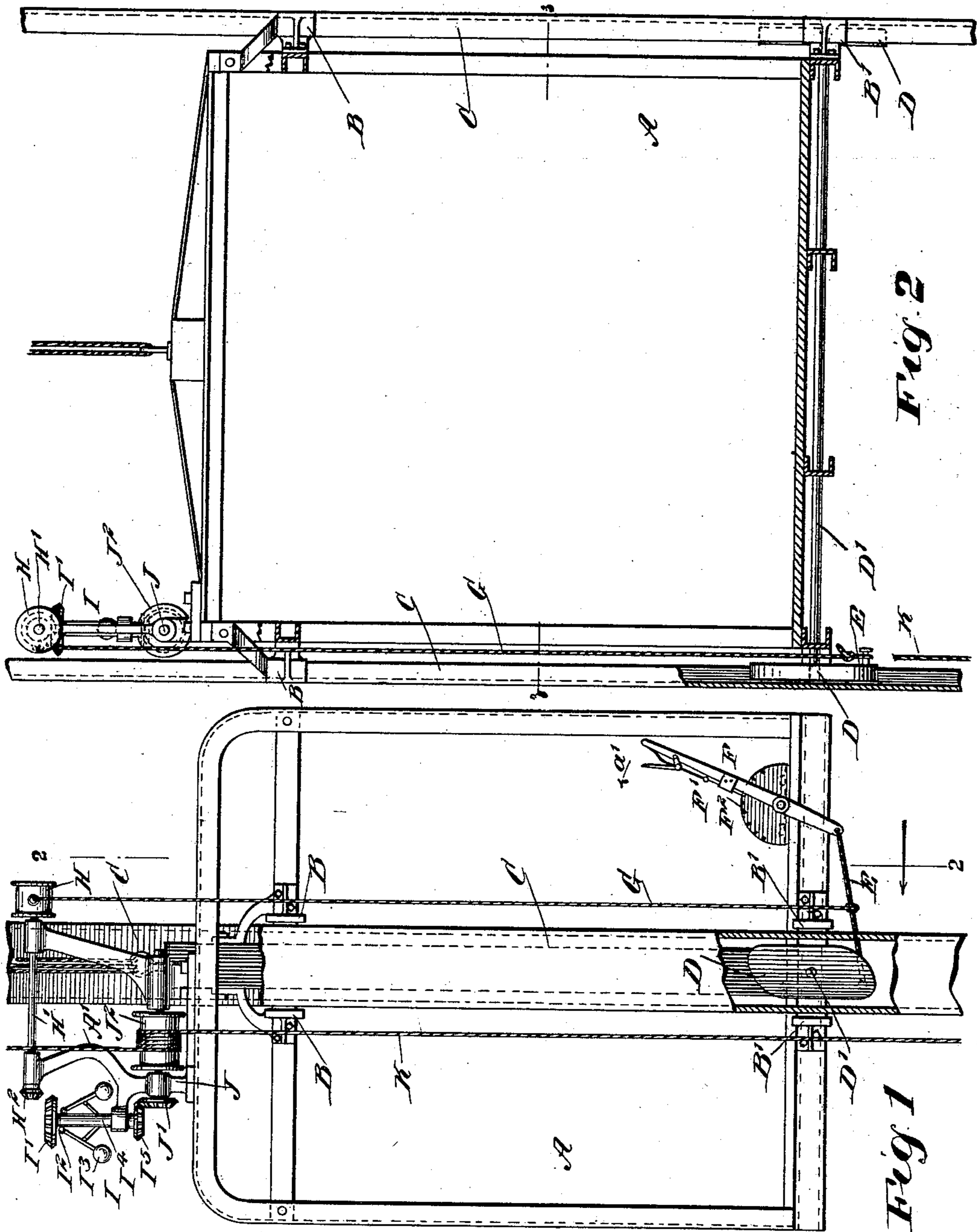
G. FOX, 2d.

SAFETY ATTACHMENT FOR ELEVATORS.

(Application filed Dec. 8, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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INVENTOR

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BY *Wm. H. Fox*

ATTORNEYS.

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2 Sheets—Sheet 2.

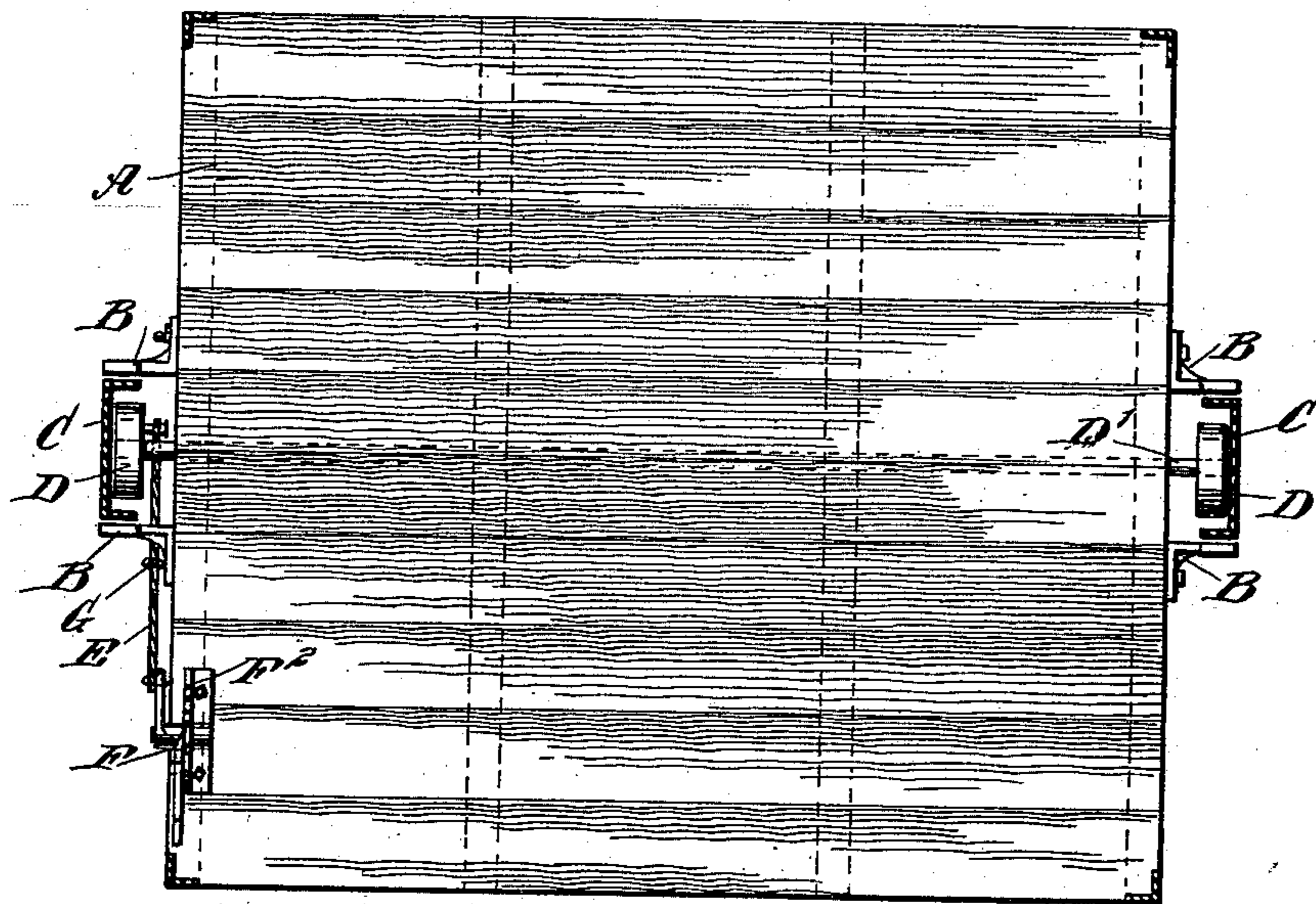


Fig. 3

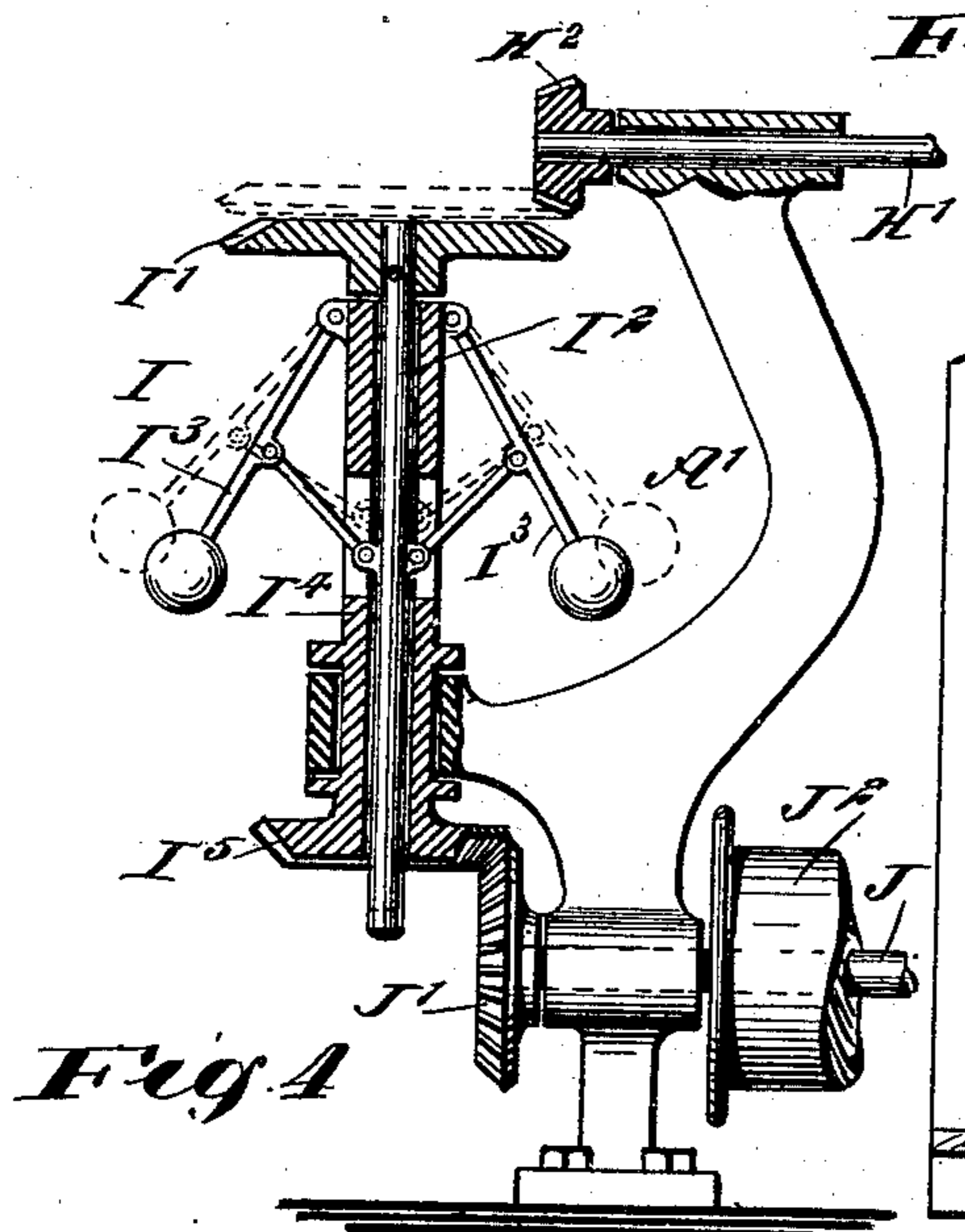


Fig. 4

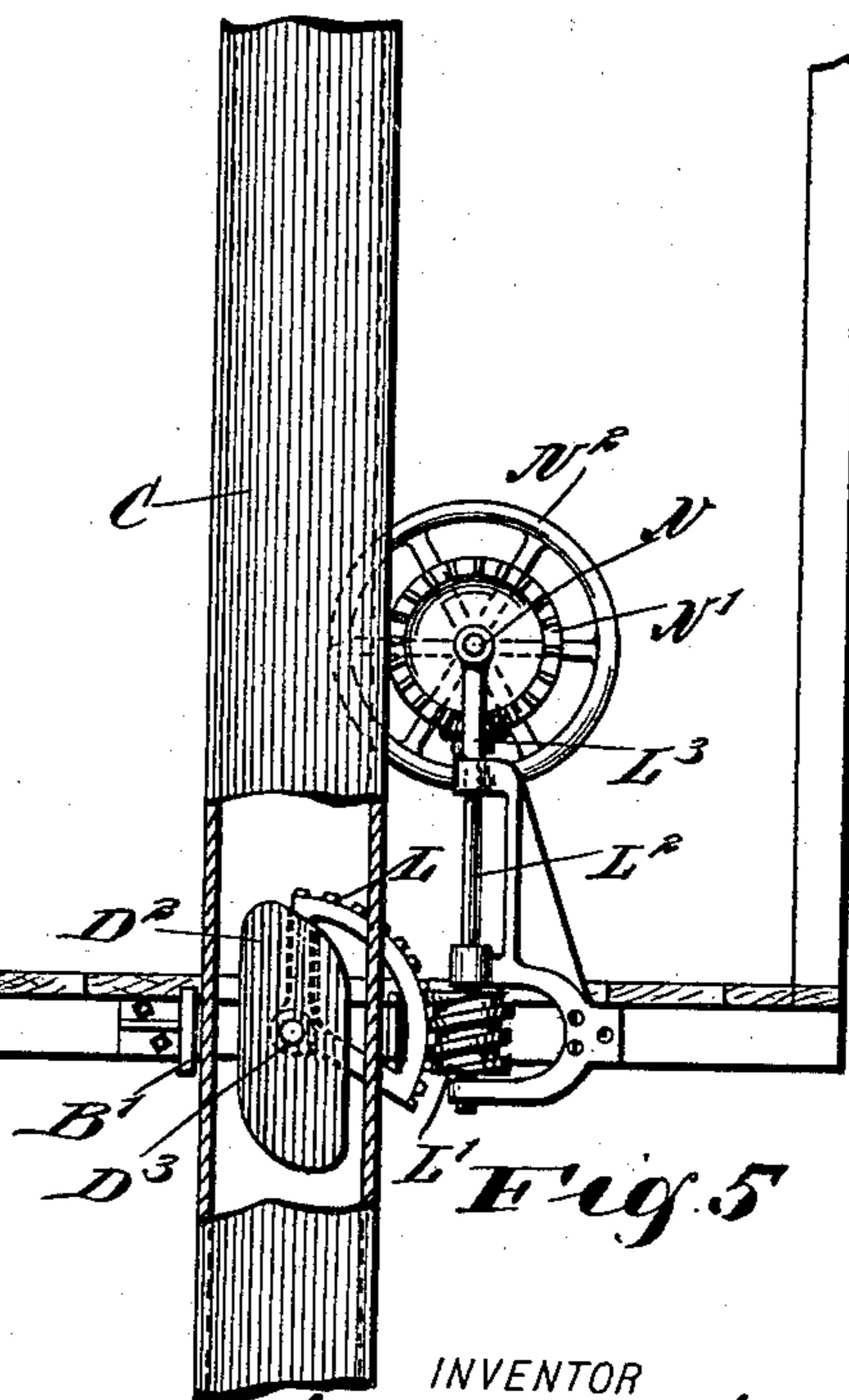


Fig. 5

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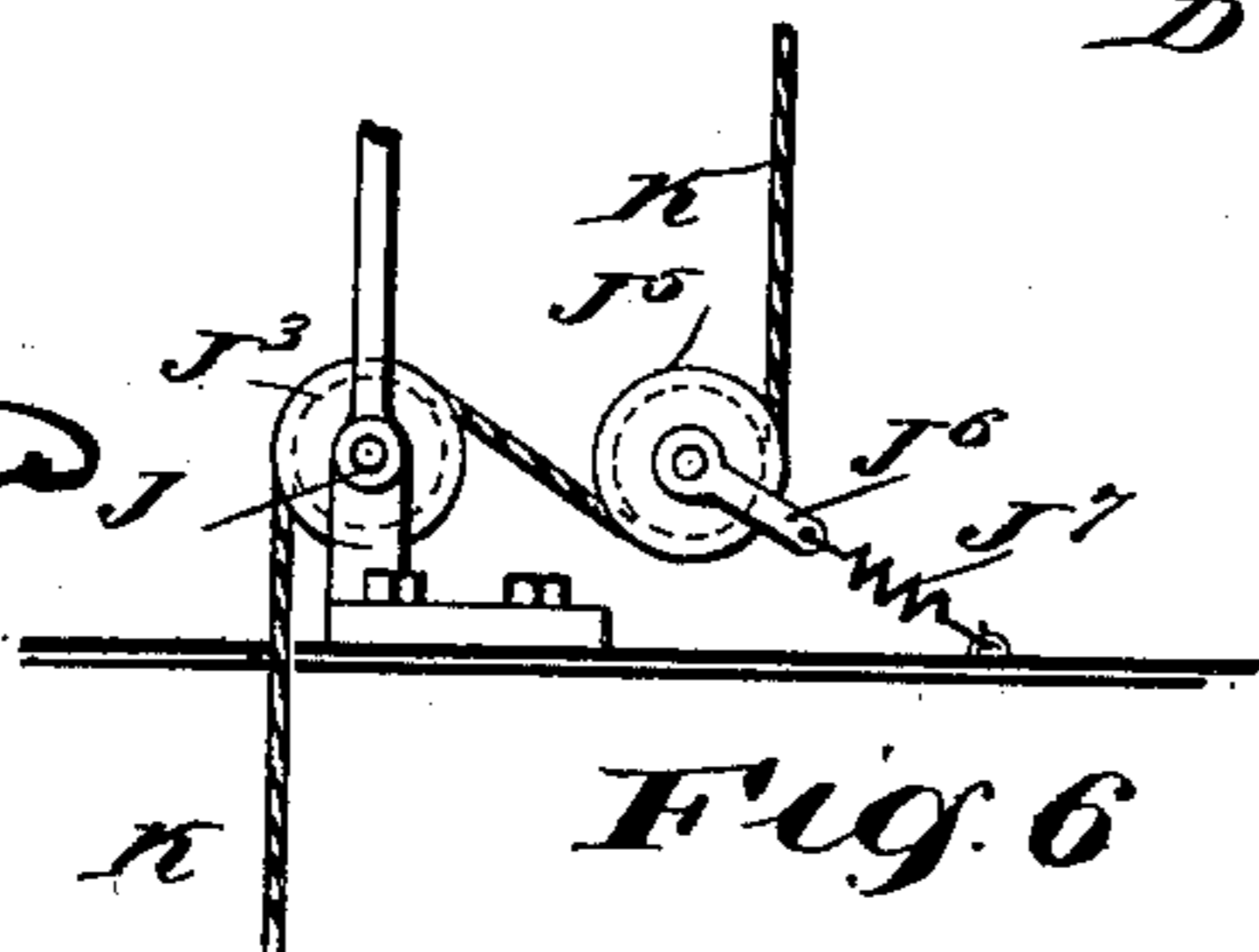


Fig. 6

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# UNITED STATES PATENT OFFICE.

GEORGE FOX, 2D, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO GEORGE F. RECKHART, OF SAME PLACE.

## SAFETY ATTACHMENT FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 622,945, dated April 11, 1899.

Application filed December 8, 1898. Serial No. 698,637. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE FOX, 2d, of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Safety Attachment for Elevators, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved safety attachment for elevators which is simple and durable in construction, very effective in operation, and arranged to securely brake or lock the elevator-cage in place in case of accidental breaking of the hoisting-rope or other means employed for raising or lowering the cage.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of my invention is represented in the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement as applied and with parts in section. Fig. 2 is a sectional front elevation of the same. Fig. 3 is a plan view of the same. Fig. 4 is an enlarged sectional side elevation of the governor. Fig. 5 is a sectional side elevation of a modified form of the improvement, and Fig. 6 is a front view of another modified form of the improvement.

The cage A is provided with the usual means for raising or lowering it and for stopping or starting the cage, and the cage is also provided on its sides with the usual top guides B and the bottom guides B', which straddle posts C, made of channel-beams set on the top of one another, the sides extending inward toward the cage, as will be readily understood by reference to Fig. 2. The guides B and B' extend to the outer faces of the sides of the channel-beams, and said outer sides may be lubricated, so as to insure a smooth running of the cage.

At the inside of the channel-beams and between the sides thereof extend cams D, secured on the ends of a shaft D', journaled in suitable bearings attached to the cage A, preferably at the under side thereof, as is

plainly indicated in Figs. 1 and 2. Each of the cams D normally travels freely up and down in the corresponding channel-beam—that is, the cams are moved bodily with the cage A—and the cam-surfaces are normally out of engagement with the inner faces of the sides of the channel-beams, so as not to in any way interfere with the free travel of the cage as long as the latter moves at a normal rate of speed.

In case of an accident the cams D are actuated so as to impinge with their cam-faces the inner faces of the sides of the channel-beams, and as these sides are not lubricated at their inner faces it is evident that the cams brake the cage on which they are carried and finally bring the cage to a stop. The cams D may be operated manually or automatically, or both.

As shown in the drawings, one of the cams is connected near its end by a rope E with a lever F, fulcrumed on the cage A and under the control of the attendant thereof, said lever being provided with the usual locking-lever F', engaging a segment F<sup>2</sup>, for normally holding the lever F in a locked position.

In case the hoisting means for the cage breaks or becomes disarranged or injured then the operator by throwing the lever F in the direction of the arrow *a'* causes the rope E to exert a pull on the cam D and swing the same and the other cam so as to bring their cam-surfaces in frictional contact with the inner faces of the sides of the channel-beams to break the cage and bring the same to a stop.

The automatic device for actuating the cams in the manner described is arranged as follows: On the rope E is attached the lower end of a rope G, extending upwardly on one side of the cage to connect with a drum H, on which the rope is adapted to wind up to pull on the rope E, so as to swing the cams into frictional contact with the sides of the channel-beams. The drum H is secured on one end of a shaft H', journaled in a suitable bracket A', attached to the top of the cage, and the other end of the shaft H' is provided with a pinion H<sup>2</sup>, normally out of mesh with a bevel gear-wheel I', secured on the upper end of the shaft I<sup>2</sup> of a governor I, carried by

the bracket A'. (See detail construction in Fig. 4.) The shaft I<sup>2</sup> is connected with the weighted levers I<sup>3</sup> of the governor, said levers being pivoted on a sleeve I<sup>4</sup>, mounted to turn in suitable bearings in the bracket A' and in which the shaft I<sup>2</sup> is mounted to slide vertically, said shaft rotating, however, with the sleeve I<sup>4</sup>. The lower end of the sleeve is provided with a bevel gear-wheel I<sup>5</sup> in mesh with a bevel gear-wheel J', secured on a shaft J, carrying a pulley J<sup>2</sup>, on which winds several times a rope K, secured at its upper and lower ends in the top and bottom of the elevator-shaft, suitable devices being at the ends of the rope for keeping it tight in the shaft. As the cage A ascends or descends the pulley J<sup>2</sup> is rotated by the winding and unwinding of the fixed rope K, and the rotary motion of the drum J<sup>2</sup> is transmitted by the shaft J and gear-wheel J' to the gear-wheel I<sup>5</sup> and the sleeve I<sup>4</sup>, which rotates the shaft I<sup>2</sup>, mounted to slide in said sleeve.

In case the cage A, for any cause whatever, travels beyond the normal rate of speed then an increased speed is given to the drum J<sup>2</sup> and the parts connected therewith, so that the weighted levers I<sup>3</sup> of the governor fly outward to such an extent as to raise the shaft I<sup>2</sup> and bring the bevel gear-wheel I' in mesh with the pinion H<sup>2</sup>. When this takes place, the shaft H' is rotated, and consequently the rope G is wound up on the drum H, to exert a pull on the rope E and swing the cams D in frictional contact with the sides of the channel-beams to brake and stop the cage, as previously described. Instead of rotating the drum J<sup>2</sup> by winding the rope K several times around the drum I may employ the device shown in Fig. 6, in which the rope passes over a pulley J<sup>3</sup> on the shaft J, connected with the governor, as described, said rope also passing under a pulley J<sup>5</sup>, journaled in bearings J<sup>6</sup>, held on a spring J<sup>7</sup>, attached to the cage A to give the desired tension to the rope K, to rotate the pulley J<sup>3</sup> and shaft J upon the ascent or descent of the cage A.

Instead of using the hand-lever F for manipulating the cams D, as described, I may employ the construction shown in Fig. 5, in which a shaft D<sup>3</sup>, carrying cams D<sup>2</sup>, is provided with segmental worm-wheel L in mesh with a worm L', secured on a vertically-disposed shaft L<sup>2</sup>, journaled in suitable bearings attached to the cage A. The upper end of the shaft L<sup>2</sup> carries a bevel-pinion L<sup>3</sup> in mesh with a bevel gear-wheel N', secured on a shaft N, carrying a hand-wheel N<sup>2</sup> under the control of the operator, so that when the latter turns the hand-wheel a rotary motion is given to the shaft L<sup>2</sup> by the gear-wheel N' and pinion L<sup>3</sup> to cause the worm-wheel L' to rotate the worm-wheel L and the shaft D<sup>3</sup> to swing the cams D<sup>2</sup> in frictional contact with the inner faces of the sides of the channel-beams.

I do not limit myself to the particular means described for carrying the invention into effect, as it is evident that the construction may

be varied without deviating from my invention.

It will be seen that the device is very simple and durable in construction, is not liable to get out of order, and is always ready and completely under the control of the operator of the cage, and is also in addition controlled by the speed of the cage, so that accidents to human beings traveling in the cage are rendered almost impossible.

If desired, only a single cam may be employed or a plurality of sets of such cams may be used and connected together by suitable means, so that all the cams move into action as soon as an accident occurs.

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

1. A safety attachment for elevators comprising fixed posts forming guideways for the elevator-cage and consisting of channel-beams, cams carried by the cage and arranged to move normally free between the inner faces of the sides of the channel-beams, and means for actuating the cams to cause them to impinge on the sides of said beams, substantially as described.

2. In an elevator, channel-beams adapted to form at the outer faces of the sides guideways for the cage to travel in, and to form at the inner faces of the sides contact-surfaces, and a cam carried by and moving with the cage and arranged to move normally freely between the sides of the channel-beams and to impinge thereon upon actuating the cam to brake the cage and lock it in place on the channel-beams, substantially as shown and described.

3. In an elevator, channel-beams adapted to form at the outer faces of the sides guideways for the cage to travel in, and to form at the inner faces of the sides contact-surfaces, a cam carried by and moving with the cage and arranged to move normally freely between the sides of the channel-beams and to impinge thereon upon actuating the cam, to brake the cage and lock it in place on the channel-beams, and means under the control of the attendant of the cage, and connected with said cam to actuate the latter, substantially as shown and described.

4. A safety attachment for elevators comprising a cam carried by the elevator-cage, fixed posts forming guideways for the cage and contact-faces for the cam to impinge when actuated, a fixed rope in the elevator-shaft, a governor carried by the cage and actuated by the said fixed rope and a connection between the said governor and the cam for actuating the cam when the cage travels at a high rate of speed, substantially as described.

5. In an elevator, channel-beams adapted to form at the outer faces of the sides guideways for the cage to travel in, and to form at the inner faces of the sides contact-surfaces, a cam carried by and moving with the cage

and arranged to move normally freely between the sides of the channel-beams and to impinge thereon upon actuating the cam, to brake the cage and lock it in place on the channel-beams, a fixed rope in the elevator-shaft, a governor carried by the cage and actuated by said fixed rope, and a connection between the said governor and the cam, for actuating the cam when the cage travels at a high rate of speed, substantially as shown and described.

6. In an elevator, channel-beams adapted to form at the outer faces of the sides guideways for the cage to travel in, and to form at the inner faces of the sides contact-surfaces, a cam carried by and moving with the cage and arranged to move normally freely between the sides of the channel-beams and to impinge thereon upon actuating the cam, to brake the cage and lock it in place on the channel-beams, a fixed rope in the elevator-shaft, a governor carried by the cage and actuated by said fixed rope, a connection between said governor and the cam, for actuating the cam when the cage travels at a high rate of speed, said means comprising a flexible connection with the cam, a drum for wind-

ing up the flexible connection, a shaft carrying said drum, and a pinion on said shaft and adapted to be engaged by a gear-wheel on the governor-shaft, substantially as shown and described.

7. In an elevator, the combination with the elevator-cage provided with top and bottom guides and fixed posts forming guideways for the cage and consisting of channel-beams, the sides of which extend inward toward the cage, the said top and bottom guides extending to the outer faces of the sides of the channel-beams, of a shaft journaled in bearings attached to the cage, cams secured on the ends of said shaft and extending at the inside of the channel-beams and between the sides thereof, the said cams being each arranged to normally travel freely up and down in the corresponding channel-beam, and to impinge thereon when actuated to brake the cage and lock it in place on the channel-beams, and means for actuating said cams, substantially as shown and described.

GEORGE FOX, 2D.

Witnesses:

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EVERARD BOLTON MARSHALL,