

No. 713,707.

Patented Nov. 18, 1902.

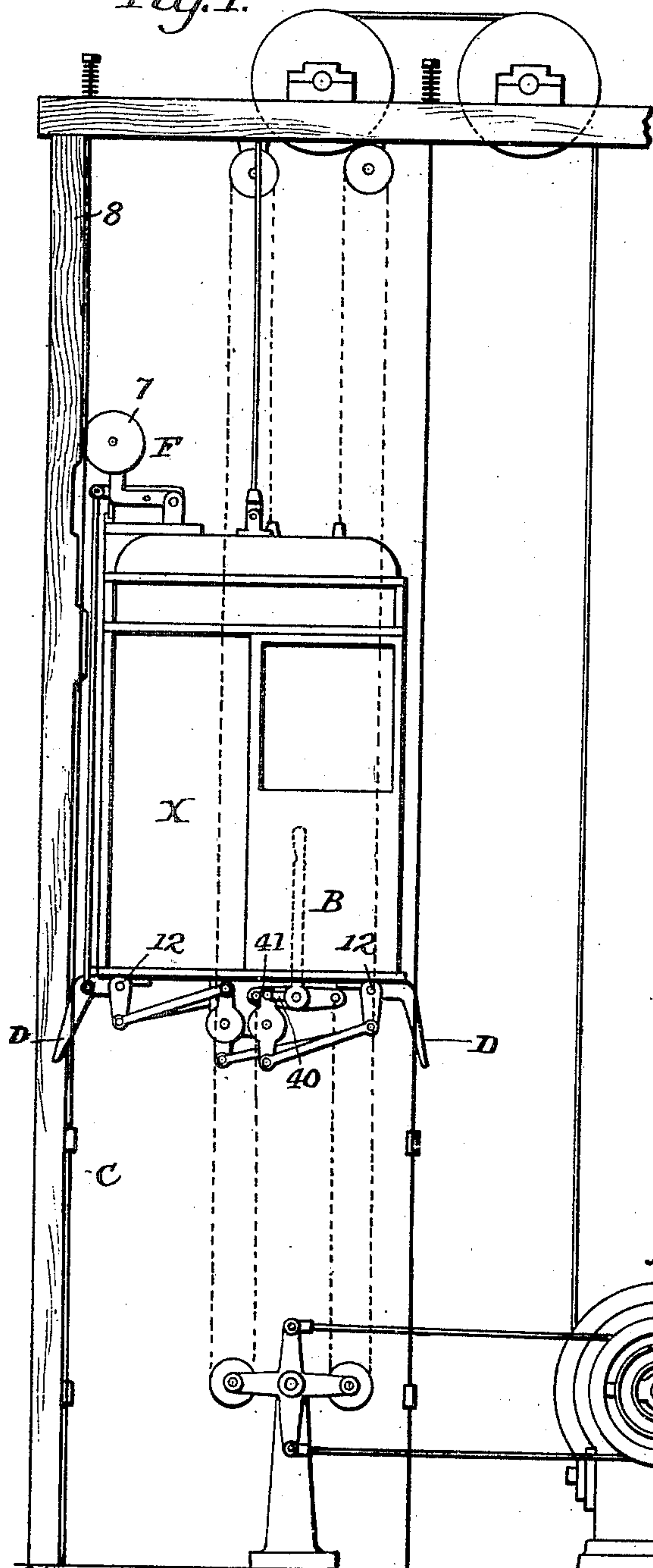
R. C. SMITH.  
SAFETY DEVICE FOR ELEVATORS.

(Application filed May 8, 1902.)

(No Model.)

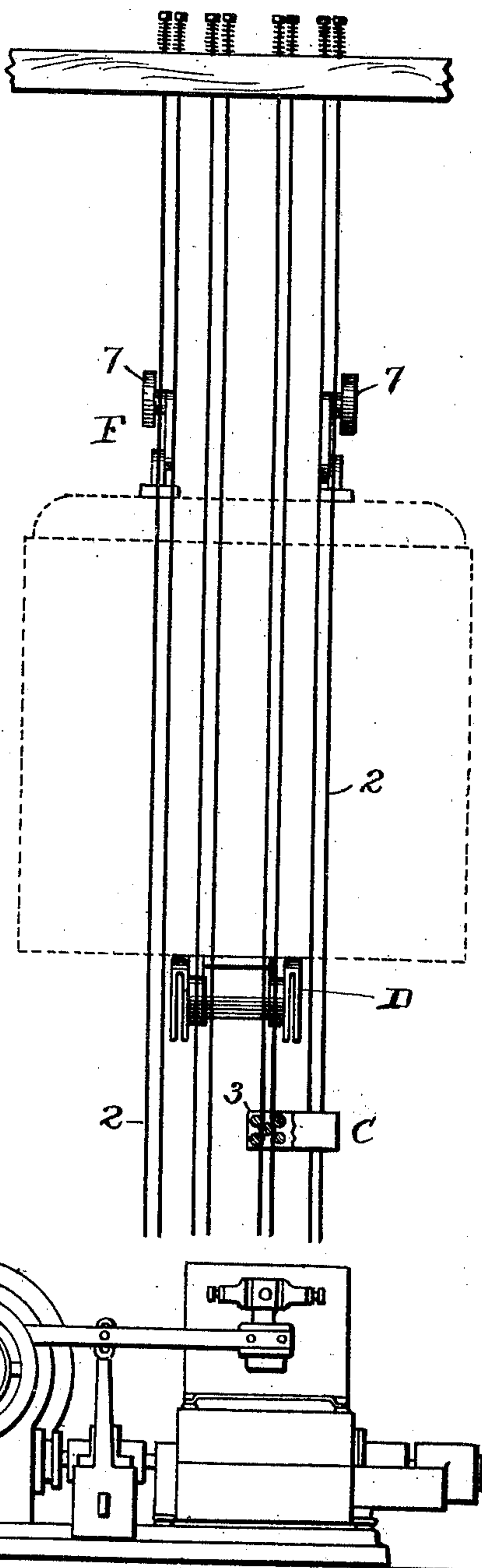
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Fig. 1.



Witnesses  
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Fig. 2.



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Fig. 3

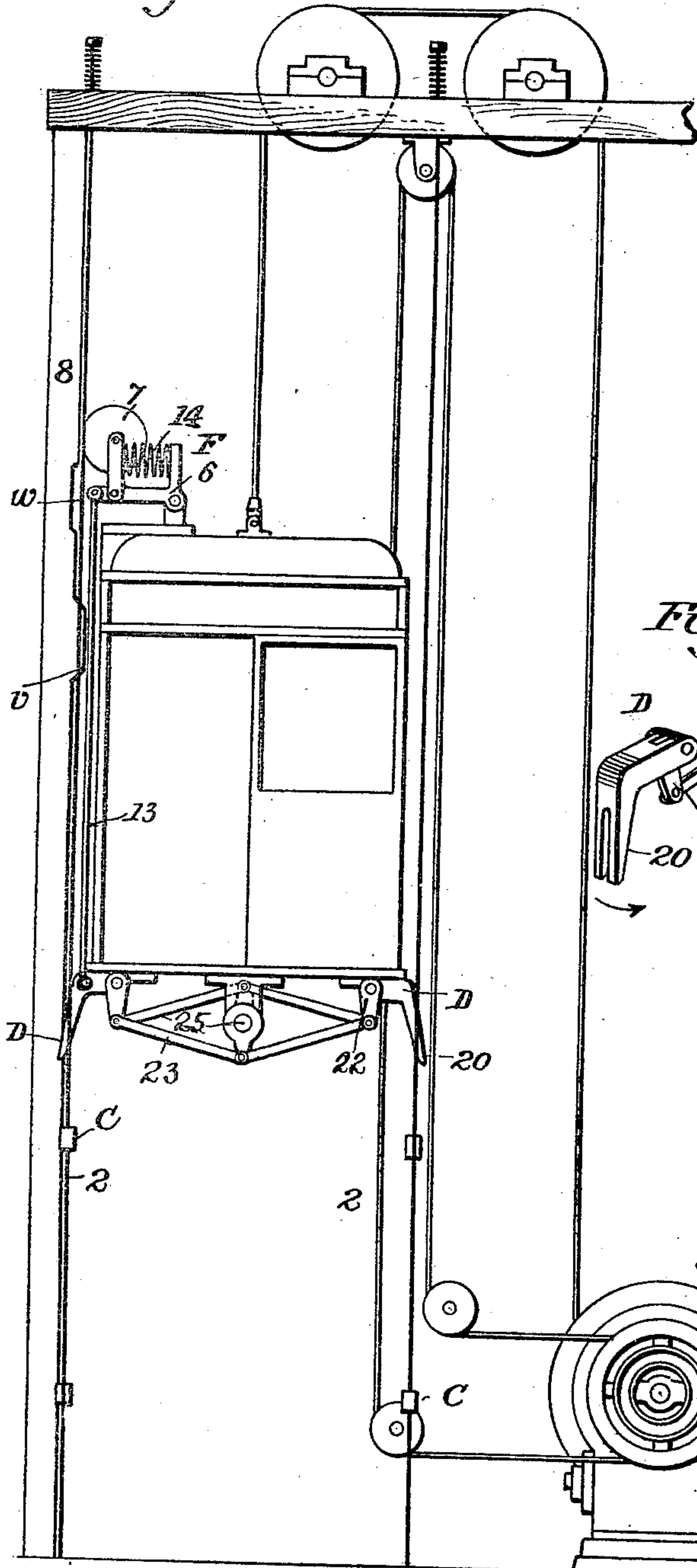


Fig. 5.

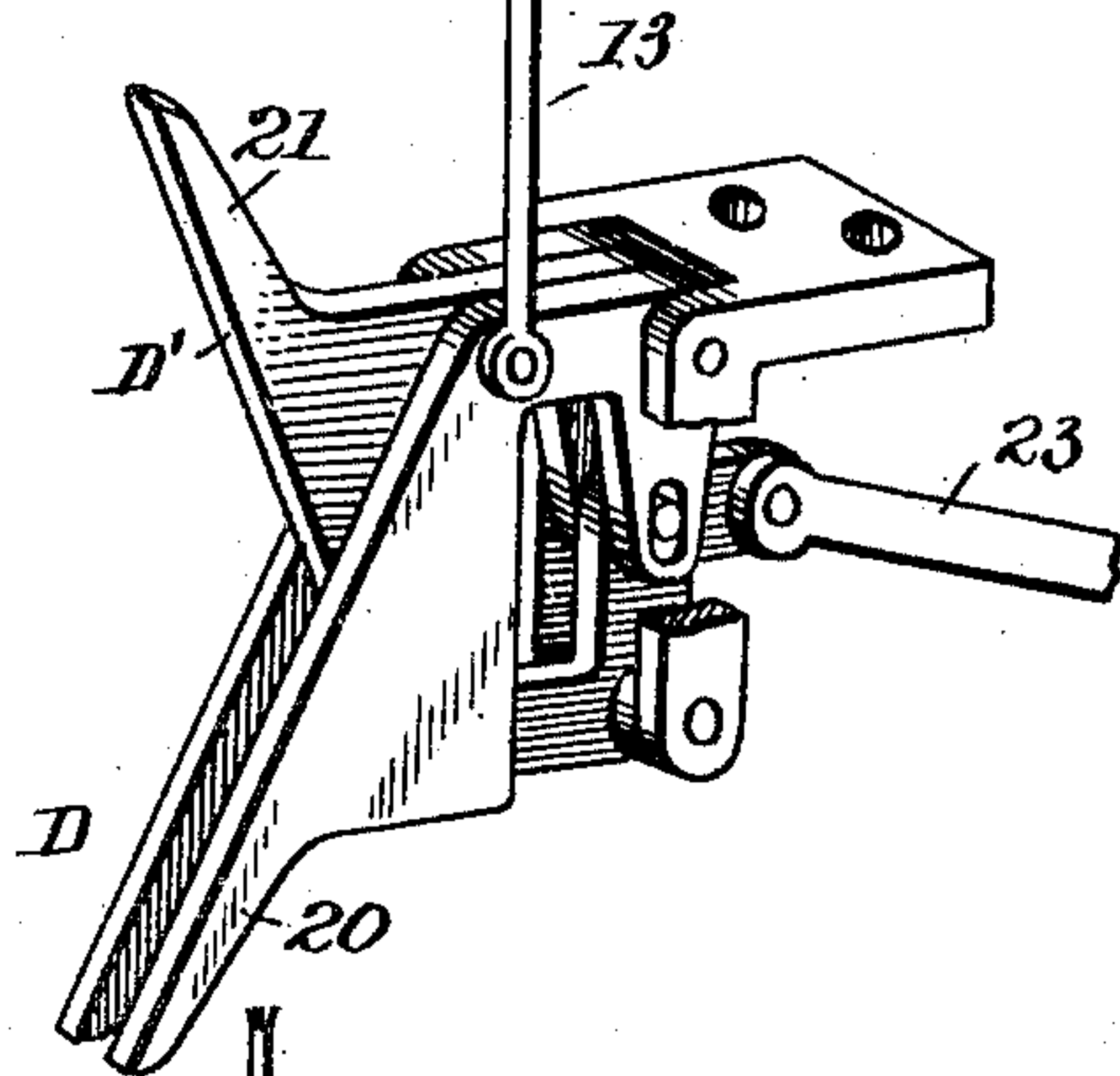
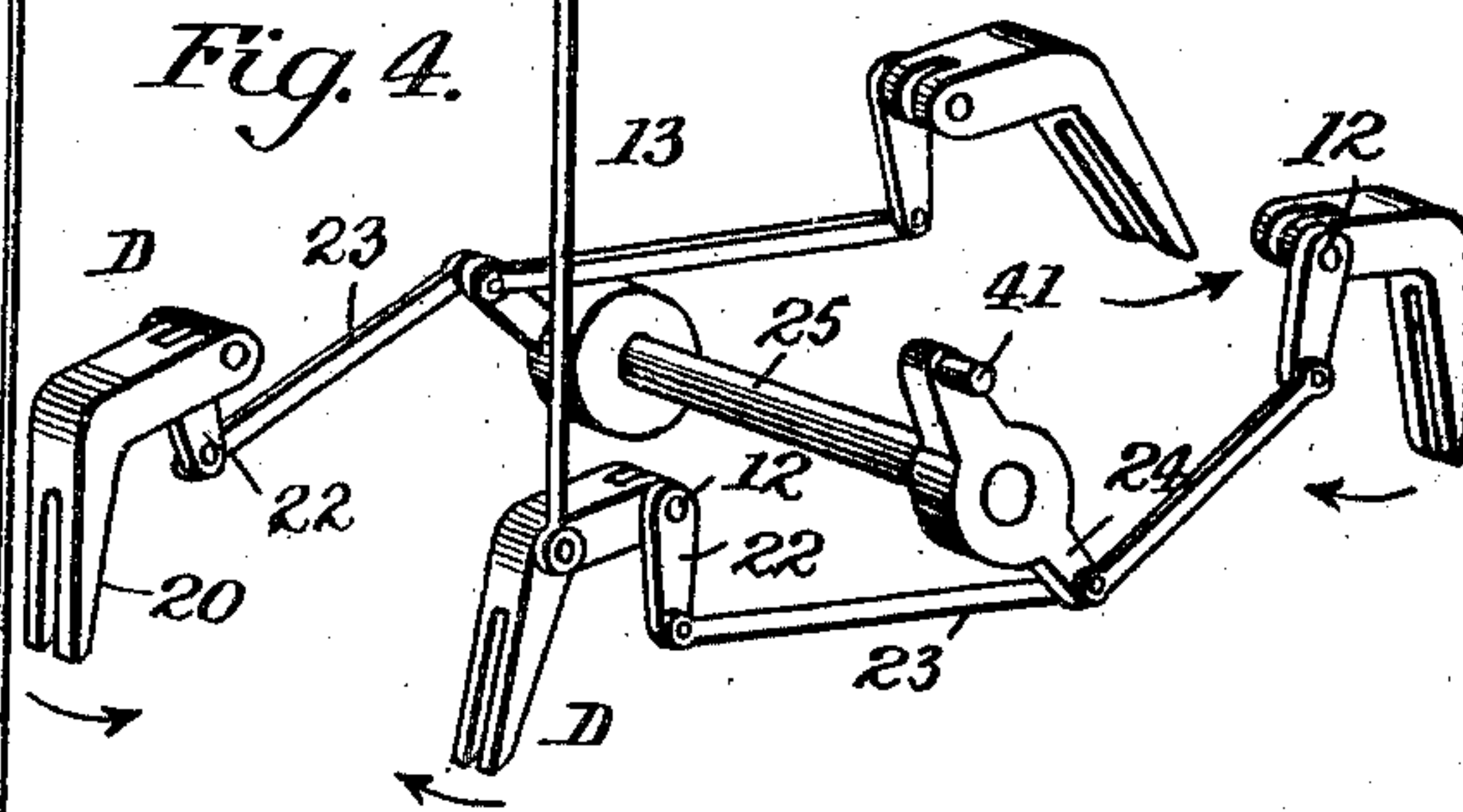


Fig. 4.



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# UNITED STATES PATENT OFFICE.

RUDOLPH C. SMITH, OF YONKERS, NEW YORK, ASSIGNOR TO OTIS ELEVATOR COMPANY, OF EAST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 713,707, dated November 18, 1902.

Application filed May 8, 1902. Serial No. 106,472. (No model.)

*To all whom it may concern:*

Be it known that I, RUDOLPH C. SMITH, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Safety Devices for Elevators, of which the following is a specification.

My invention relates to certain new and useful improvements in elevators, and more especially to safety devices therefor; and my invention consists in the construction and arrangement of parts substantially as hereinafter set forth and illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of an elevator-car and its connections, showing my improvements applied thereto. Fig. 2 is a side view showing the car in dotted lines with the dogs and controller thereon and the suspended wires or rods provided with the retarders. Fig. 3 is a view similar to Fig. 1, but with the parts somewhat differently arranged. Fig. 4 is a perspective view of the dogs and their connections detached from the car, and Fig. 5 is a perspective view of a modified form of dog.

The car X is operated from any suitable motor A, an electric motor being shown provided with any suitable stopping and starting device actuated, as usual, from a hand-control device B in the car, a control-lever being shown. The car travels within a well and is provided with dogs D, which may be brought into contact with what I term "retarders" C, which may be any suitable device whereby the speed of the car is gradually arrested in case the car travels at more than normal velocity. As shown, the retarder consists of a plate 3, having pins so arranged as to bend suspended wires or rods 2, and thereby resist the downward motion of the plate as set forth in Letters Patent No. 618,141, issued to me January 24, 1899.

The position of the dogs D is regulated by a controller F, which may be of any suitable construction and which in turn is shifted by means of bearings in the well, against which a wheel 7 of the controller bears in such manner that as any one of the dogs approaches a

retarder it is swung inward and so maintained until it passes the retarder, when it is swung outward if the cage is moved at normal speed; but if this speed is exceeded the controller will not shift the dog out of contacting position, in which case the controller will make contact with the dog and will be gradually carried downward until the resistance to the downward movement overcomes the momentum of the cage and brings it to a state of rest. These features, generally speaking, are set forth in my aforesaid Letters Patent.

Instead of making use of a plurality of controllers I so connect the dogs that they may all be moved by a single controller, whether there be one or two dogs at each side of the cage. As shown, there are two dogs at each side of the cage turning upon pivots 12 and each having an arm 22, connected by a connecting-rod 23 with an arm 24 upon a shaft 25, rocking in bearings on the car, and the arm 24 at one end of the shaft extends in an opposite direction to that at the other end.

Normally—that is, when the apparatus is at rest, as indicated in Fig. 1—the arms at opposite sides of the shaft 25 are vertical and the dogs at opposite sides of the car are in engaging position. When, therefore, a dog at one side of the car is moved inward out of engaging position, that at the opposite side will be moved farther outward, but will still be in engaging position, so that at no time can there be such position of the dogs that one or more of the same are not in engaging position.

The retarding devices at opposite sides of the well are at different heights—that is, they alternate—so that when a dog is carried inward to escape one of the retarding devices at one side of the well the connected dog will be at some distance above the retarding device at the other side of the well and may be carried inward to avoid engagement after the other dog has passed its retarding device. When there is more than one dog at each side of the cage, the arrangement is such that one will be in engaging position when the other is out of engaging position. The retarding devices at that side of the well alternate, so that as one of the dogs passes one retarder



the other is at some distance above the other retarder.

The controller F is shifted in any suitable manner. Preferably its wheel 7 bears upon a track 8, having breaks or depressions *w* and protruding portions *v*, thus forming bearings on different vertical planes, the roller being in contact with the main or central bearing-face when the dogs are in their central position (shown in Fig. 1) and making contact with the depressed bearing or elevated bearing to shift the dogs to one position or the other.

There is any suitable connection between the controller and the dogs. As shown, the roller 7 is carried by a frame 6, pivoted at the top of the cage and connected by a connecting-rod 13 with one of the dogs, a spring 14 pressing the roller against the track.

The dogs may be of any suitable shape, but, as shown, are L-shaped, their fingers extending between the wires or rods 2.

In some instances—as, for instance, when a car is overbalanced—it may be desirable to provide against the possibility of accident from the car running upward, in which case I provide a double set of dogs D D', one with fingers 20 extending downward and the other with fingers 21 extending upward, as illustrated in Fig. 5, the two being so supported and connected that when one dog swings inward the other will swing inward also. It is most desirable to insure that all of the dogs shall, if possible, be in position at one time to make contact with the retarding devices. I therefore so arrange the same that in their central position each of the dogs will project outward to such an extent as to make contact with the retarders, so that by locking the dogs in this position I can insure against any possible non-engagement with the retarders in case the car should fall. Different locking means may be employed, but preferably I make use of the hand-controller B, which has a pin 40 so arranged that when the hand-controller is in its central position and the dogs are in their central positions the pin 40 will be opposite the pin 41 on an arm upon the shaft 25, but on shifting the hand-controller to either side the dogs will be unlocked.

It will be evident that some of the features above described may be used in connection with others differently constructed. For instance, the dogs arranged and operating as shown may be used with retarding devices of an entirely different description, and the duplex dogs for operating both upward and downward may be arranged in other structures of a different character.

Without limiting myself to the precise construction and arrangement of parts shown and described, I claim—

1. The combination with retarding devices arranged within a well at different sides thereof, of a car carrying a plurality of dogs, connections whereby the dogs at each side of the

car are maintained normally in position to engage the retarders, and whereby either dog may be carried out of engaging position without moving the other out of engaging position, substantially as described.

2. The combination with retarding devices arranged within a well at different sides thereof, of a car carrying a plurality of dogs, connections whereby the dogs at each side of the car are maintained normally in position to engage the retarders, and whereby either dog may be carried out of engaging position without moving the other out of engaging position, a controller carried by the car and connected to shift the dogs and bearings in the well engaged by said controller to shift the same alternately in different directions, substantially as described.

3. The combination with retarders arranged at opposite sides of an elevator-well, of a car, dogs carried by the car at opposite sides and normally in position to engage the retarders, means for alternately shifting the dogs to non-engaging position as they approach the retarders at normal speed and to then restore them to engaging position, and means for maintaining the normal position of the dogs if the car moves at excessive speed, substantially as described.

4. The combination with retarders arranged at opposite sides of an elevator-well, of a car, dogs carried by the car at opposite sides and normally in position to engage the retarders, a controller connected to the dogs to shift the same, and a track with alternate projections and recesses engaged by the controller, substantially as described.

5. The combination with the well and car of an elevator, of retarding devices within the well, two pairs of dogs carried by the car, one pair at each side and arranged when in normal position to all engage the retarders and means whereby to carry one dog at each side out of engaging position while leaving the other dogs in engaging position, substantially as described.

6. The combination with the well and car of an elevator, of a pair of retarders at each side of the well alternately arranged, two pairs of dogs carried by the car, one pair at each side and arranged when in normal position to all engage the retarders and means whereby to carry one dog at each side out of engaging position while leaving the other dogs in engaging position, substantially as described.

7. The combination with the car of the two sets of dogs at opposite sides, intermediate shaft and arms and connections whereby the rocking of the shaft throws out and in the diagonally opposite dogs, substantially as described.

8. The combination with the retarder within the well, of a car and dogs thereon arranged to normally engage the retarder whether the car moves up or down at excessive speed, and means whereby to carry the



dogs out of engaging position as they pass the retarders at normal speed, substantially as described.

5 9. The combination with the safety-dogs of an elevator-car and with the hand-control device in the car, of means for locking the dogs in engaging position when the control device is in its central or stop position, substantially as described.

10 10. The combination with the car, retarders, and dogs on the car and means for changing their position according to the speed of

the car, of a hand-control device in the car and means for locking the dogs in engaging position so long as the control device is in 15 stop position, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RUDOLPH C. SMITH.

Witnesses:

E. W. MARSHALL,

W. H. BRADY.