

No. 694,091.

Patented Feb. 25, 1902.

M. W. COX.
HOISTING APPARATUS.
(Application filed Oct. 3, 1901.)

(No Model.)

Fig. 1.

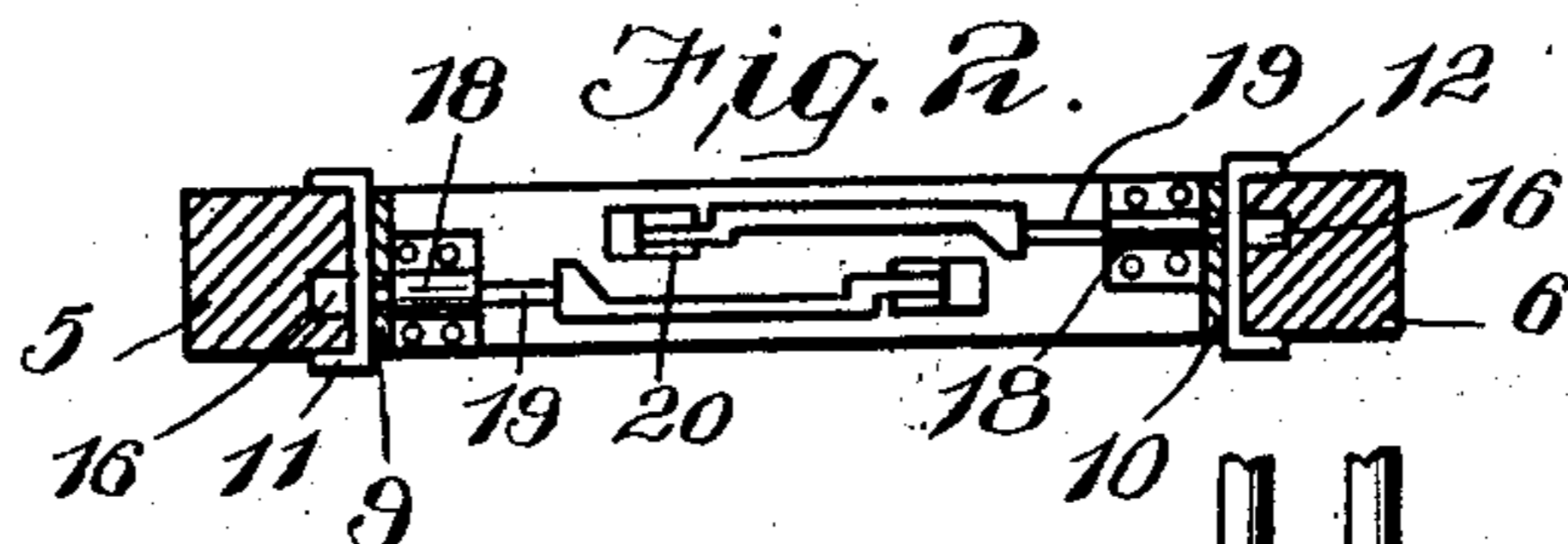
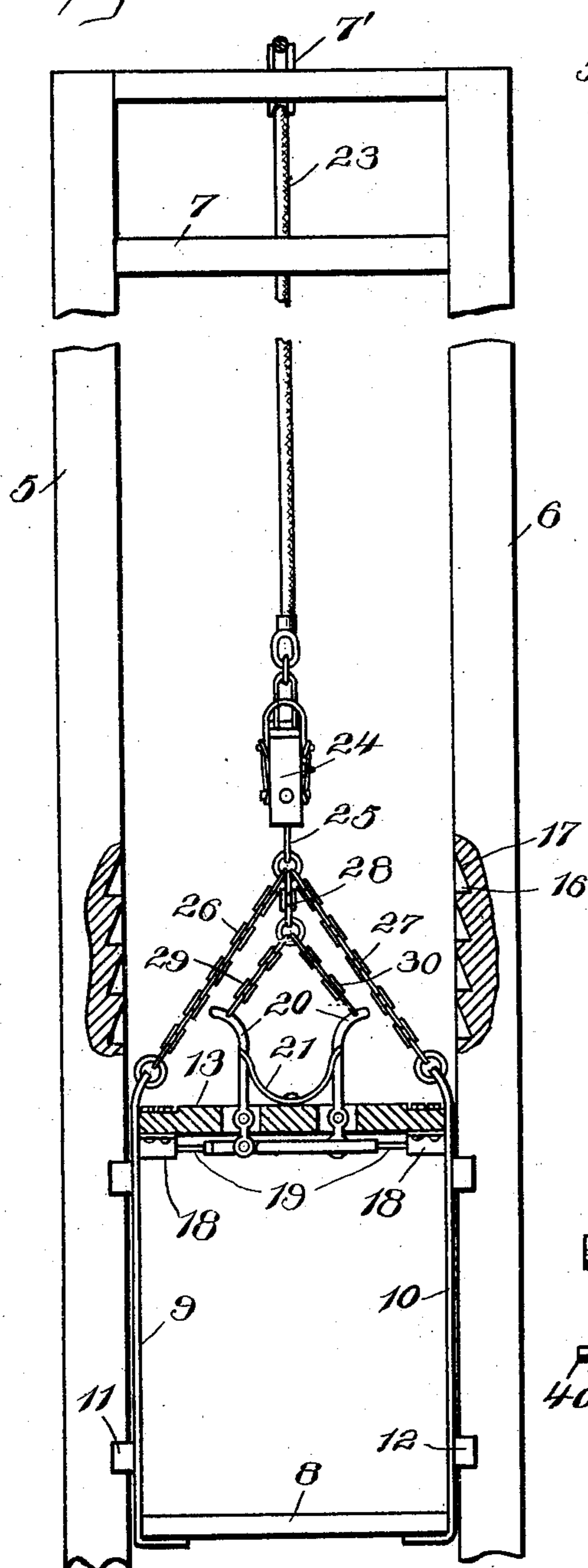


Fig. 3.

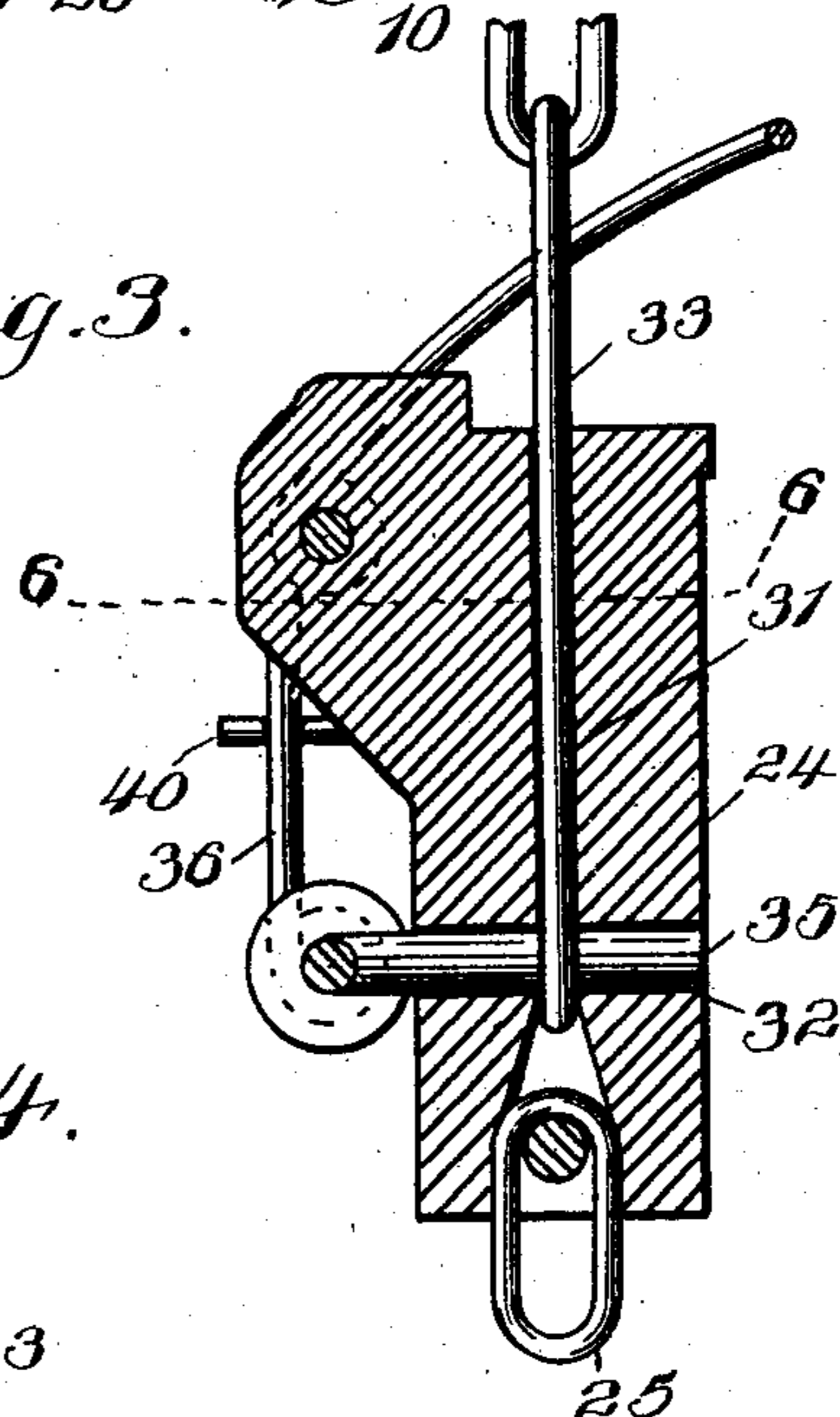


Fig. 4.

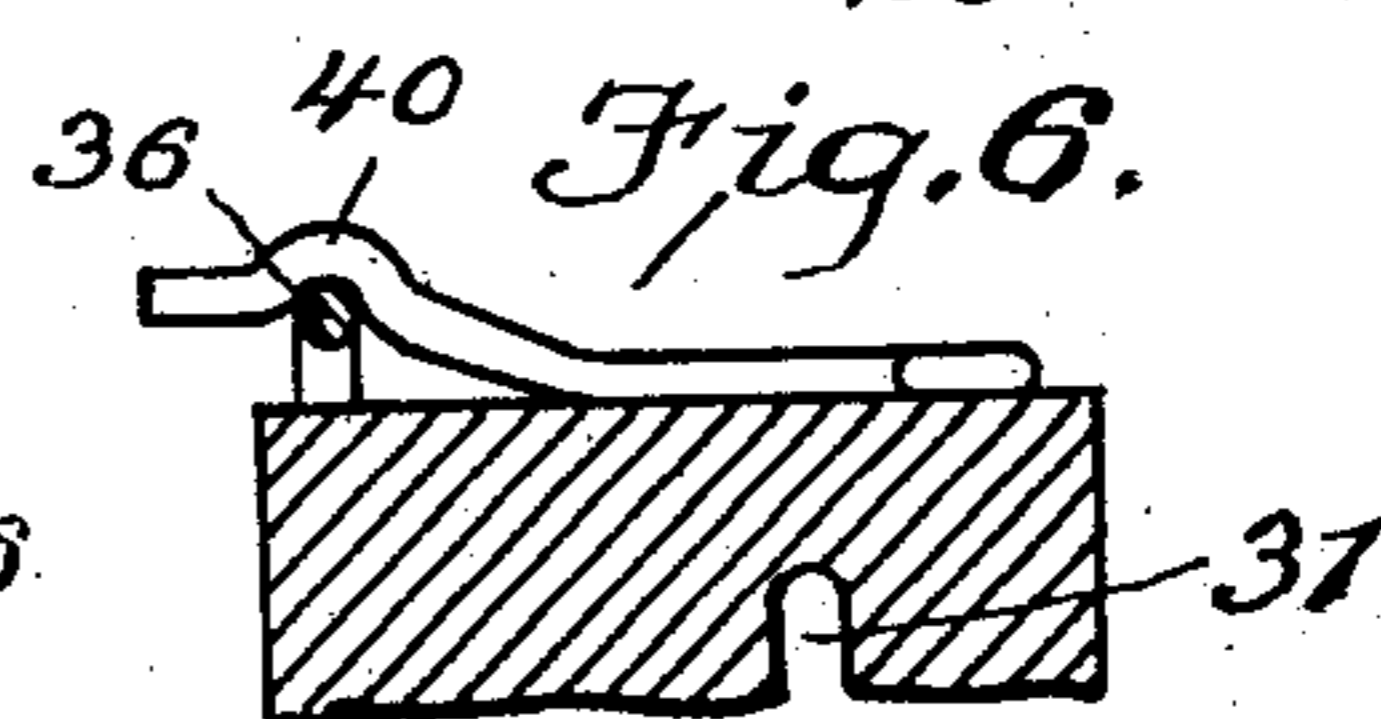
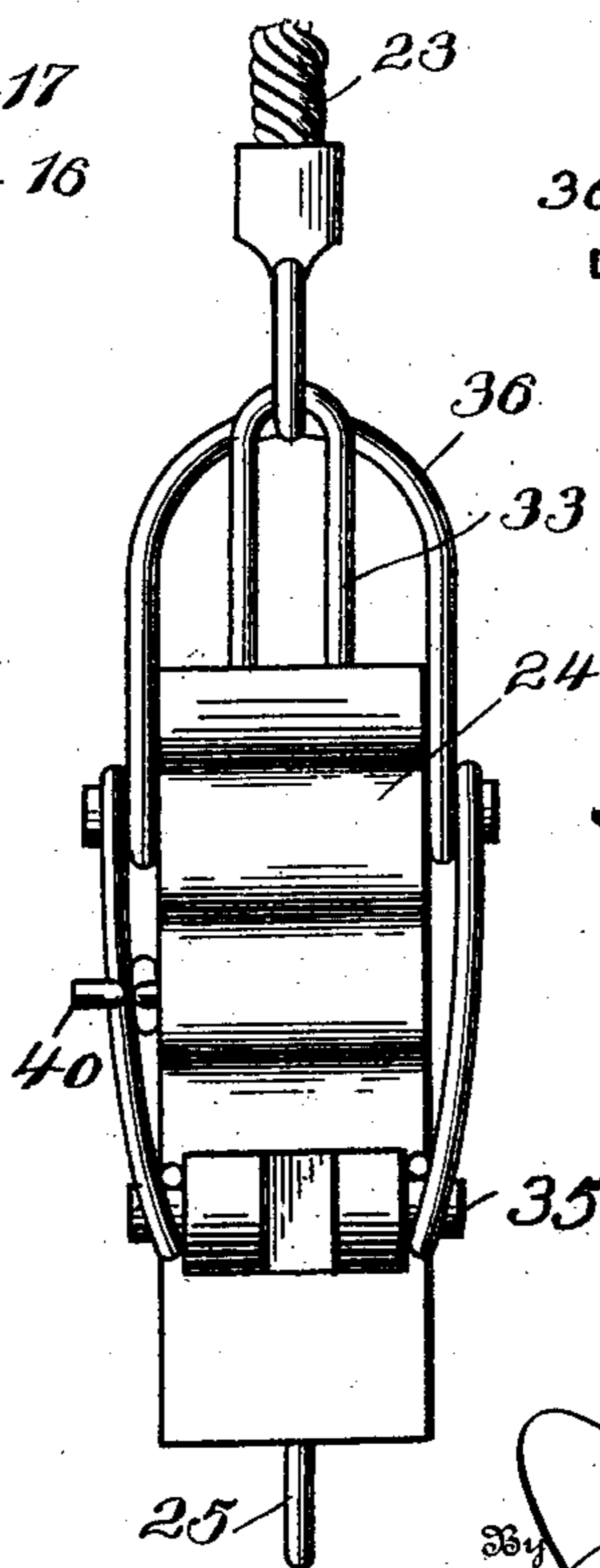
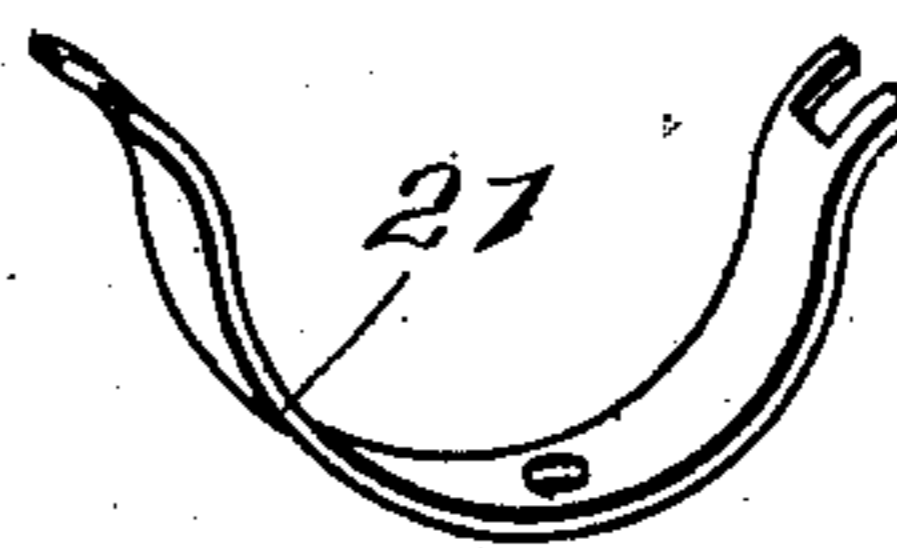


Fig. 5.



Witnesses

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HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 694,091, dated February 25, 1902.

Application filed October 3, 1901. Serial No. 77,430. (No model.)

To all whom it may concern:

Be it known that I, MARION W. COX, a citizen of the United States, residing at Duquoin, in the county of Perry, State of Illinois, have
5 invented certain new and useful Improvements in Hoisting Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it
10 appertains to make and use the same.

This invention relates to hoisting mechanisms, and particularly to elevators, and it has special reference to safety appliances for elevators, the object of the invention being to
15 provide a construction wherein should the elevator-rope break the elevator-cage will be held from falling to the bottom of the shaft, a further object of the invention being to provide a construction wherein should the
20 machinery become uncontrollable the cage will be released when it reaches the top of the shaft and will drop to the safety-catches.

Other objects and advantages of the invention have reference to the details of construction and will be understood from the following
25 description.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several
30 views, Figure 1 is a view partly in elevation and partly in section and showing a mine elevator or hoist embodying the present invention. Fig. 2 is a bottom plan view of the upper beam of the cage, the guide-rails of the
35 shaft being shown in section. Fig. 3 is a vertical section of the trip-latch. Fig. 4 is a side elevation of the trip-latch. Fig. 5 is a detail view of the spring which holds the bolts projected. Fig. 6 is a section on line 6 6 of Fig. 3.

Referring now to the drawings, there is shown a portion of a mine-shaft including the vertical guides or rails 5 and 6, having the connecting cross-beam 7 below the sheave
40 7' at the top of the tibble, and below this beam 7 is the cage.

The elevator-cage consists of the platform 8, at the sides of which are the uprights 9 and 10, having fingers or guides 11 and 12, which embrace the guide-rails and prevent lateral
50 displacement of the cage, while permitting

of easy vertical movement thereof. Connecting the upper ends of the uprights of the cage is the beam 13.

In the inner faces of the guide-rails are formed recesses 16, to the upper sides of which
55 lead the gradually-deepening channels 17. At the ends of the beam 13 and depending therefrom are the blocks 18, through which are formed perforations to register with the recesses 16, and in these perforations of the
60 blocks are disposed the sliding bolts 19, to which are pivotally connected the levers 20, which are passed upwardly through the beam 13, to which they are pivoted. To hold the bolts normally projected from the blocks 18
65 to engage the recesses 16, a strap or leaf spring 21 is secured at its central portion against the upper face of the beam, and the ends thereof are curved upwardly to place them under
70 tension and are disposed against the upper ends of the levers, the ends of the spring being bifurcated to form fingers, as shown in Fig. 5 of the drawings, which lie at opposite
sides of the levers to hold the spring in place.

As above intimated, above the beam 7 is
75 the sheave 7', over which is passed downwardly the lifting-cable 23, connected with a trip-latch mechanism hereinafter specifically described and including the block 24, having a ring 25 engaged with its lower end. At
80 attached to the ring 25 are the chain-sections 26 and 27, which are connected in turn to the upper ends of the uprights of the elevator-cage and through the medium of which the
85 cage is lifted.

To hold the bolts retracted when strain is put upon the chains 26 and 27 to lift the cage and when the cage is being lowered by the cable, a chain 28 is connected to the ring 25, and the two branches 29 and 30 thereof are
90 attached to the upper ends of the levers 20 and are of such lengths that when the chains 26 and 27 are under tension the sections 29 and 30 will be under such tension as to operate the connected levers to draw the bolts
95 inwardly. Thus when the cage is suspended from the cable the bolts are drawn from the recesses of the guide-rails and the car may be raised and lowered at will. If, however, the cable should break, the levers would be re-
100

leased and the spring would force the bolts outwardly to engage recesses and stop the cage at whatever point the cage might be.

The trip-latch mechanism above referred to includes the block 24, through the upper end of which and extending longitudinally thereof is formed a recess or passage 31, intersecting the lower portion of which is the passage 32, and the passage 31 is adapted to receive a link 33, to which the lifting-cable is attached. A U-shaped lever is disposed to straddle the block 24, and the sides thereof are pivoted to the block, while the ends of the lever are pivoted to a coupling-pin 35, disposed in the passage 32, so that as the lever is rocked the coupling-pin is reciprocated into and out of engagement with the link, which may be disposed in the longitudinal passage of the block. The lever 36 is pivoted at one side of the block 24, and the upper end thereof projects beyond the opposite side of the block, so that when the block is raised by the cable to raise the elevator-cage the upper end of this lever will be brought into engagement with the beam 7, and if the car is further raised the lever will be pivotally moved to draw the coupling-pin from engagement with the link and the block, and therewith the cage will be dropped, when the bolts will engage with the recesses of the guide-rails to hold the car from further downward movement. Thus should the machinery not be stopped and the cable continue to be drawn in after the cage has reached the top of the shaft the cable will be disengaged from the cage, but the latter will be dropped only a short distance.

In practice modifications of the specific construction shown may be made, and any suitable materials and proportions may be used for the various parts without departing from the spirit of the invention.

To hold the bolt or coupling-pin of the trip-latch yieldably in its engaging position, the spring-latch plate 40 is provided, this latch-

plate being secured at one end against the side face of the block 24 and with its free end in position for engagement over one side of the U-shaped lever when the bolt or pin is moved inwardly. The latch-plate does not hold the lever positively, but prevents the pin from moving outwardly under the influence of the shaking of the block.

What is claimed is—

1. In a hoisting apparatus, the combination with uprights and a cross-beam having a supporting-roller thereon and a second cross-beam disposed therebelow, of a cage slidably mounted between the uprights, a cable passed over the pulley and downwardly adjacent to the second beam and having a terminal link, a block connected to the cage and having a longitudinal opening and a transverse perforation intersecting the opening, said opening having the link disposed therein, a pin passed through the perforation and link, and a U-shaped lever connected to the pin and pivoted to the block thereabove, said lever extending transversely of and above the block for engagement with the second beam to retract the pin when the cable is drawn upwardly.

2. In a hoisting mechanism, a trip-latch including a block having a longitudinal passage and a transverse perforation intersecting the passage, a pin disposed in the perforation for engagement with a link in the passage, a U-shaped lever pivoted upon the block above the pin and having its lower end pivoted to the pin, said lever having its sides extending diagonally of the block and projecting thereabove, and a spring connected to the lever and block and adapted to hold the pin inwardly of the perforation.

In testimony whereof I affix my signature in presence of two witnesses.

MARION W. COX.

Witnesses:

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