

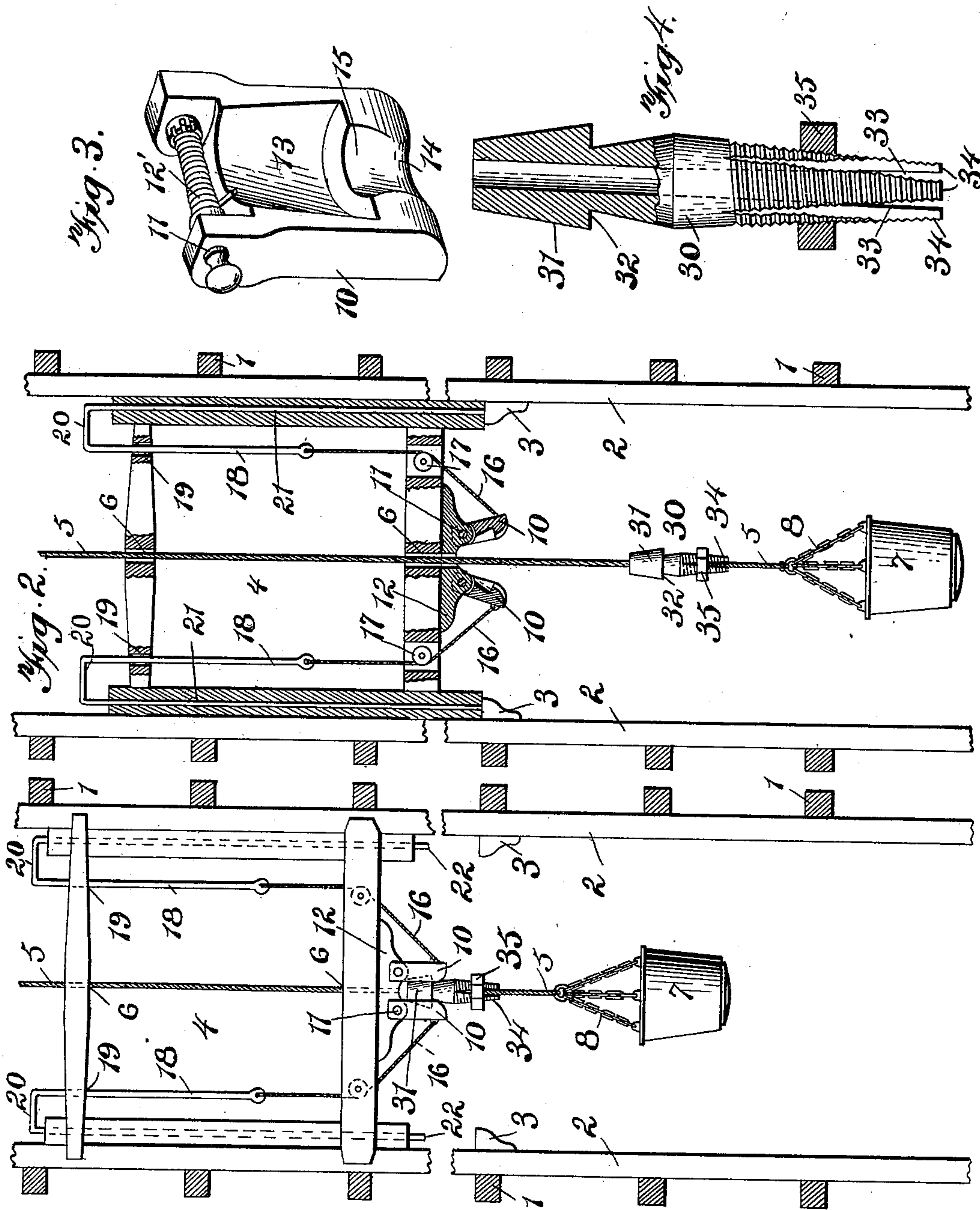
No. 656,204.

Patented Aug. 21, 1900.

D. McCOWAN.  
SAFETY DEVICE FOR MINES.

(Application filed Mar. 29, 1900.)

(No Model.)



Witnesses:  
Geo. C. French.  
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Fig. 1.

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# UNITED STATES PATENT OFFICE.

DUNCAN McCOWAN, OF NEIHART, MONTANA.

## SAFETY DEVICE FOR MINES.

SPECIFICATION forming part of Letters Patent No. 656,204, dated August 21, 1900.

Application filed March 29, 1900. Serial No. 10,617. (No model.)

*To all whom it may concern:*

Be it known that I, DUNCAN McCOWAN, a citizen of the United States, and a resident of Neihart, Cascade county, State of Montana, have invented certain new and useful Improvements in Safety Devices for Mines; and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

This invention relates to elevators, and more especially to safety devices used in connection therewith; and the object of the same is to produce an improved safety device for mines, to prevent the accidental falling of the cross-heads, which so often results disastrously to the workmen beneath.

It is well known that in sinking the mine it is customary as the work progresses to timber the sides of the shaft for the purpose of preventing a cave-in and to put in uprights to connect the timbers and to serve as guides for the elevator and cross-head. It is also well known that in lowering the latter by means of the bucket-rope the cross-head often sticks near the mouth of the mine, while the rope and bucket descend to the miners working beneath, and afterward the cross-head falls with a rush, so as to break through all supports and kill or maim the miners beneath. Means have been heretofore employed for indicating to the engineer when the weight of the cross-head was removed from the rope, although it will be understood that the latter still remained taut by reason of the bucket yet suspended thereby. To the end of providing a cheap, simple, and effective safety device for successful use under these conditions, I have produced the present invention, which consists in the details of construction claimed below, the entire device being hereinafter set forth in such manner as to be clear to those skilled in the art, and illustrated in the accompanying drawings, wherein—

Figure 1 is a sectional view of a mine, showing a descending bucket and cross-head provided with my safety device. Fig. 2 is a similar view showing the cross-head as resting on the supports near the bottom of the mine and the bucket as yet descending. Fig. 3 is an enlarged view of the clutch mechanism.

Fig. 4 is a similar view of the adjustable rope-clamp.

Referring to the said drawings, 1 1 designate the timbers, and 2 2 are the upright guides, to whose inner faces are attached the supports 3, as well understood.

4 is the cross-head, constructed in any suitable manner and moving on the guides until its descent is arrested by the supports.

5 is the rope, which passes through eyes 6 in the cross-bars of the cross-head and sustains the bucket 7 through the medium of spreader-chains 8, all as well understood in this art.

Coming now more particularly to the present invention, 10 10 are the two members of the clutch, each hung on its shaft 11 in a casting 12 at the lower end of the cross-head and sprung normally inward by a spring 12'. Each clutch member is provided on its inner face with a half-socket 13, its lower end being beveled, as at 14, and the bevel connected with the socket by a notch 15. From the back of this member leads a chain or cord 16, which passes over a pulley 17 in the cross-head and thence upward to a rod 18. The latter passes loosely through an eye 19 in the upper cross-bar, extends thence outward, as at 20, and thence downward through a hole 21 in the side bar of the cross-head, and normally protrudes, as at 22, in position to rest upon the support 3. There are two of these ropes, as shown in the drawings, and the springs 12' cause the lower ends 22 of the rods 18 to protrude, and it is clear that when such ends are pushed upward by the supports the chains or cords 16 are drawn upon and the members of the clutch are opened.

In Fig. 4 is best seen the rope-clamp I preferably employ in connection with this clutch. It comprises a tubular body 30, with an enlarged and tapering head 31 at its upper end, forming an annular shoulder 32, the parts being so shaped that the shank of the body will fit in the notches 15 and the head will fit in the sockets 13 in the clutch members, and yet when the latter are turned outward on their pivots the head will be released. As before stated, the body is tubular, so that the rope 5 may pass therethrough. Its lower end is notched, as at 33, into fingers 34, exteriorly



threaded for the reception of a nut 35, and when this is screwed onto the tapering fingers they are sprung inward and clamped upon the rope. By this means it will be clear  
 5 that the entire rope-clamp can be set quickly on the rope at any desired position with relation to the bucket or can be removed therefrom at will.

In operation the cross-head and bucket are  
 10 lowered, as shown in Fig. 1, and when the protruding ends of the rods strike the supports the clutch members are opened and the bucket continues to descend, the engineer realizing by the reduced tension of the rope  
 15 what has happened, but knowing by the length of the rope paid out that the cross-head has reached the supports. In the same way if the tension should be reduced at any other time than when the rope was paid out to this extent he would realize that the cross-head had  
 20 stuck and would act accordingly. On the ascent of the rope the head of the clamp passes between the notches 15 and strikes the lower end of the lowermost eye 6 in the cross-  
 25 head, and continued upward movement lifts the cross-head, which permits the clutch members to close.

All parts are of the desired sizes, shapes, proportions, and materials, and considerable  
 30 change in the specific details of construction may be made without departing from the principle of my invention.

What I claim as new is—

1. In a safety device for mines, the combination with the guides, the cross-head moving thereon, the bucket - rope passing loosely through the cross-head, and supports on the guides; of a clutch at the bottom of the cross-head, means for opening it when the cross-  
 35 head engages the supports, a clamp below the clutch and adapted to be engaged by the same, and means for removably and adjustably attaching the clamp to the rope, as and for the purpose set forth.

45 2. In a safety device for mines, the combination with the guides, the cross-head moving thereon, the bucket-rope passing loosely

through the cross-head, and supports on the guides; of a clutch at the bottom of the cross-head, means for opening it when the cross-  
 50 head engages the supports, a clamp below the clutch and adapted to be engaged by the same, the body of the clamp being tubular to receive the rope and notched at its lower end to produce fingers, and a nut surrounding  
 55 these fingers for securing the clamp adjustably on the rope, substantially as described.

3. In a safety device for mines, the combination with the guides, the cross-head moving thereon, the bucket - rope passing loosely  
 60 through the cross-head, and supports on the guides; of rods moving loosely in holes in the side bars of the cross-head and projecting at their lower ends below the same, their upper ends being bent inward, a clamp on the rope  
 65 below the cross-head, a clutch on the cross-head for engaging said clamp, and connections between the members of the clutch and the inturned ends of said rods, as and for the purpose set forth.

4. In a safety device for mines, the combination with the guides, the cross-head moving thereon, the bucket - rope passing loosely through the cross-head, and supports on the guides; of a clutch having spring-actuated  
 75 members pivoted to the lower cross-bar on the cross-head, a rope-clamp which said members are adapted to engage, chains or cords leading from the members outward and over pulleys in said cross-bar, and rods extending  
 80 from said chains or cords upward through the top cross-bar, thence outward, thence downward through holes in the side bars of the cross-head, and projecting below the latter so as to rest upon said supports, as and for the  
 85 purpose set forth.

In testimony whereof I have hereunto subscribed my signature this the 12th day of March, A. D. 1900.

DUNCAN McCOWAN.

Witnesses:

RICHARD BENNETT,  
 JOS. J. SCHWERDT.