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J. TAYLOR, J. A. McMILLEN & T. C. B. MILBERY.

SAFETY ELEVATOR DEVICE.

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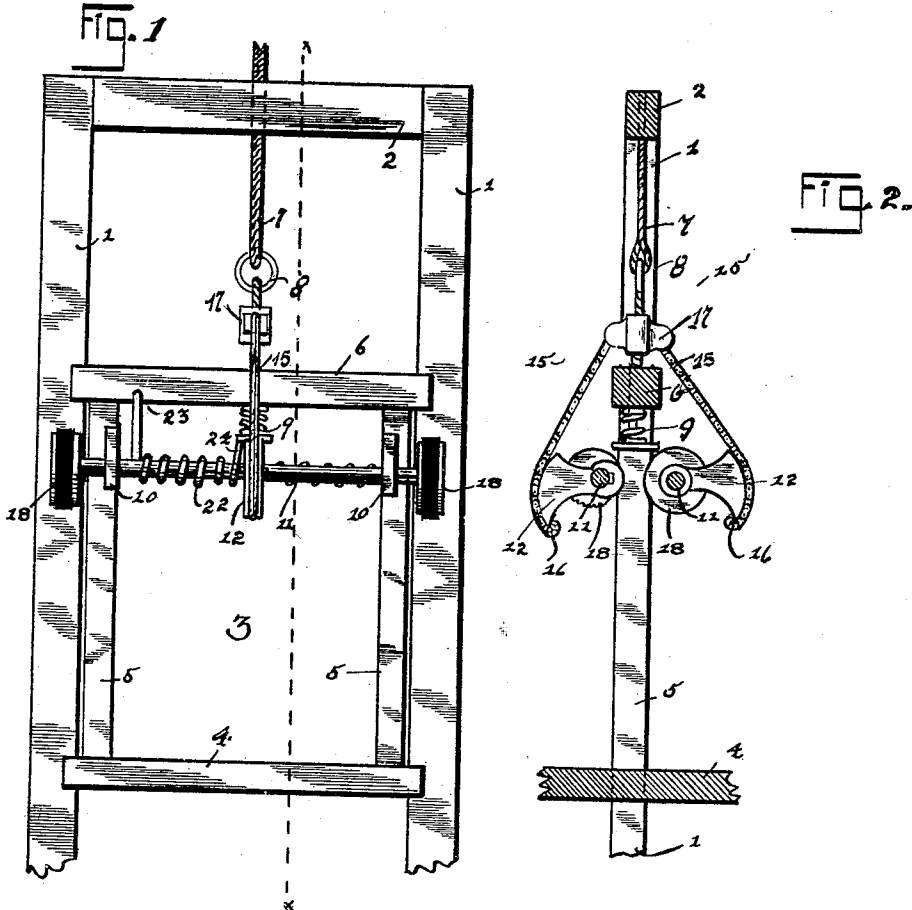
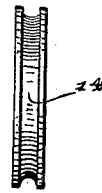
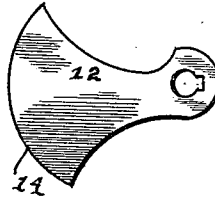
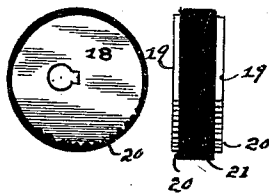


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.



Witnesses:
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UNITED STATES PATENT OFFICE.

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SAFETY ELEVATOR DEVICE.

No. 824,452.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JOHN TAYLOR, JAMES A. McMILLEN, and THOMAS C. B. MILBERY, citizens of the United States of America, residing at Castle Shannon, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Safety Elevator Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in safety elevator devices; and the invention relates more particularly to a safety device adapted to be used in connection with the elevators or cages of mine-shafts.

The primary object of this invention is to provide positive and reliable means in connection with the cage or hoist of a shaft for preventing the cage or hoist from descending when its supporting or hoisting cable breaks. To this end we have devised simple and inexpensive means which are attached to the cage or hoist of a shaft and are adapted to be actuated when the supporting-cable of the cage breaks, the actuation of said means causing the side frames of the mine-shaft to be gripped, and thereby preventing the hoist or cage from falling to the bottom of the shaft.

With the above and other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts to be hereinafter more fully described and then specifically pointed out in the claims, and, referring to the drawings accompanying this application, like numerals of reference designate corresponding parts throughout the several views, in which—

Figure 1 is a front elevation of a portion of the frame of a mine-shaft and a cage or hoist adapted to operate in said frame. Fig. 2 is a vertical sectional view taken on the line $x x$ of Fig. 1. Fig. 3 is a side elevation of a gripping-eccentric. Fig. 4 is a front elevation of the same. Fig. 5 is a side elevation of a cross-arm used in connection with the device, and Fig. 6 is a front elevation or edge view of the same.

In the accompanying drawings we have illustrated the vertical frames 1 1 of a mine-shaft, these frames being adapted to extend

down in a mine-shaft to one of the passage-ways or compartments thereof and these frames being generally braced at their upper ends by a cross-head 2 and numerous other braces within the shaft, which are not shown for the sake of clearness of illustration. The vertical frames 1 1 serve as guides for a cage or hoist 3, said hoist consisting of a platform 4, standards 5 5, and a cross-beam 6. The cross-beam and the platform engage the confronting sides of the frames 1 1, thereby insuring a perfect guidance of the hoist or cage between the frames of the mine-shaft. It is a common practice to secure the hoisting cable, rope, or chain 7 to an eyebolt 8, mounted in the cross-beam 6 of the cage or hoist 4, and interposed between the cross-beam 6 and the lower end of the eyebolt is a coiled spring 9, which serves functionally as a cushion to relieve any jarring occasioned by a sudden stopping of the cage or hoist 3.

Our invention resides in providing the sides of the standards 5 5 adjacent to the cross-beam 6 with outwardly-extending brackets 10 10, in which are journaled transverse shafts 11 11. Keyed centrally upon said shafts are outwardly-extending segment-shaped crank-arms 12 12, the curved grooved edges 14 14 of said crank-arms having cables 15 15 secured to their lower ends, as at 16 16. The opposite ends of the cables are fastened to a cross-head 17, carried by the eyebolt 8.

The outer ends of the shafts 10 10 are provided with gripping-eccentrics 18 18, said eccentrics being preferably keyed upon the ends of the shafts 11 11. Each gripping-eccentric consists of two disks or circular plates 19 19, having serrated or toothed surfaces 20 20. Between the disks or plates 19 19 is placed rubber 21 21 of a resilient nature, which in practice is adapted to frictionally engage the frames 1 1 of the mine-shaft, while the serrated surfaces or edges 20 20 of said eccentrics are adapted to engage in the frames 1 1 and prevent the hoist or cage 3 from descending when the hoisting-cable 7 breaks.

In connection with the shafts 11 11 we employ springs 22 22, a spring being placed upon each shaft. The springs surround the shafts 11 11, having their ends engaging the cross-beam 6, as at 23 23, and the segment-shaped crank-arms 12 12, as at 24 24.

In operation should the hoisting-cable 7 break above the cross-head 17 the release of the cables 15 15 permits of the springs 22 22 rotating the shafts 11 11 and throwing the gripping-eccentrics 18 18 into engagement with the frames 1 1 to prevent further descent of the hoist or cage 3. Should the eyebolt 8 break below the cross-head 17, the cables 15 15 will still support the cage or hoist 3 until the hoisting-cable 7 or the eyebolt 8, whichever may have broken, can be repaired.

The gripping-eccentrics, which are composed of the disks or plates 19 19, having serrated edges and bodies of rubber, are adapted to firmly grip the sides of the frame 1. The serrated edges of the plates 19 19 engage the surfaces of the frames 1 1, while the rubber 21 of each gripping-eccentric frictionally engages the frames and prevents the hoist or cage 3 from falling when the hoisting-cable has parted.

We preferably construct our improved safety device of strong metal or material which when a stress or strain is exerted upon the same will withstand the weight or pressure brought to bear by the cage or hoist of the mine-shaft.

What we claim, and desire to secure by Letters Patent, is—

1. In an elevator safety device, the combination with the frames of a mine-shaft and a cage or hoist mounted between said frames, of brackets carried by said cage, shafts journaled in said brackets, segment-shaped crank-arms carried by said shafts, cables connected to said arms and to the hoisting-cable of said cage, gripping-eccentrics carried by

the ends of said shafts, said eccentrics consisting of serrated disks and an intermediate filling of rubber extending beyond the edges of the disks and means carried by said shafts to move said eccentrics into engagement with the frames of said mine-shafts, when the hoisting-cable of said cage breaks, substantially as described.

2. In an elevator safety device, the combination with the frames of the elevator-shaft and a cage suspended between said frames, of shafts mounted on said cage and extending across the same from side to side, segment-shaped arms carried by said shafts, cables connected to said arms and to the hoisting-cable of the cage, a gripping-eccentric carried on each end of each shaft, each eccentric being composed of two toothed disks and an intermediate filling of rubber extending beyond the edges of the disks, the teeth on the disks and the rubber filling being adapted to simultaneously engage the frames, a spiral spring surrounding each shaft and having one end connected to the cage and the other end connected to the segment-shaped arm, said springs being adapted to rotate the shaft when the tension of the hoisting-cable is relaxed.

In testimony whereof we affix our signatures in the presence of two witnesses.

JOHN TAYLOR.
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THOMAS C. B. MILBERY.

Witnesses:

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