G. S. BURGAN.

SAFETY DEVICE FOR ELEVATOR OR MINE CAGES.

APPLICATION FILED AUG. 11, 1906.

922,452. **Patented May 25, 1909.**

3 SHEETS—SHEET 1.

Fig. 1.

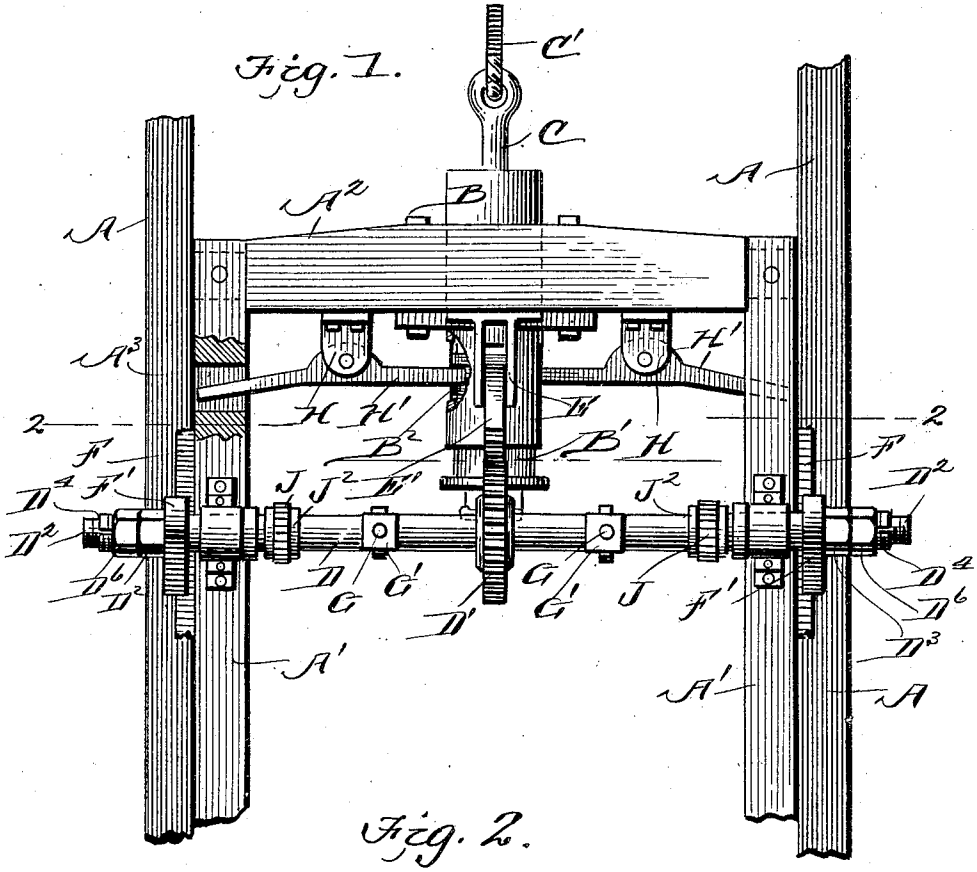
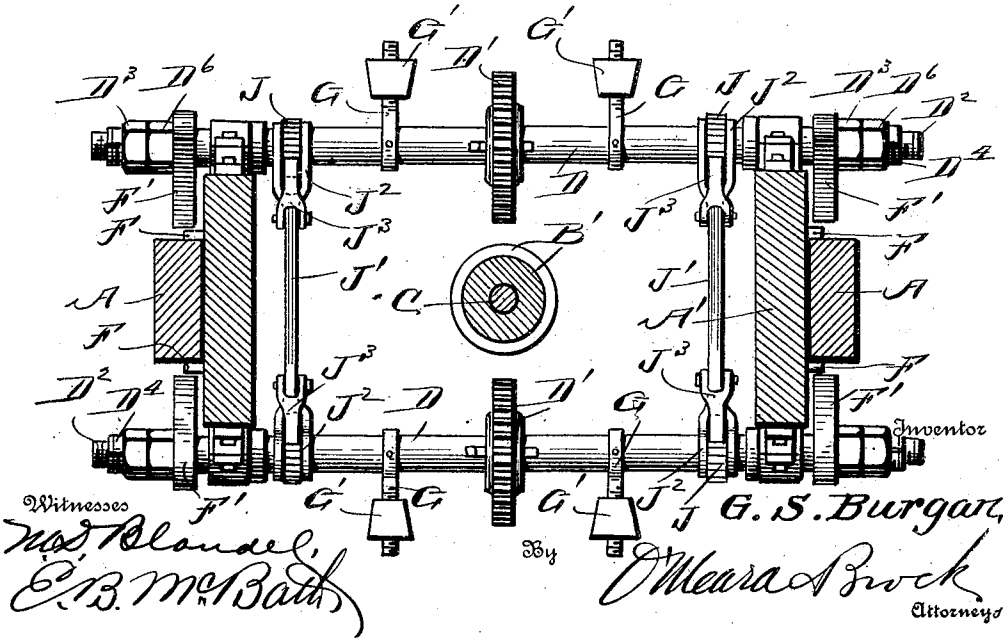


Fig. 2.



Witnesses

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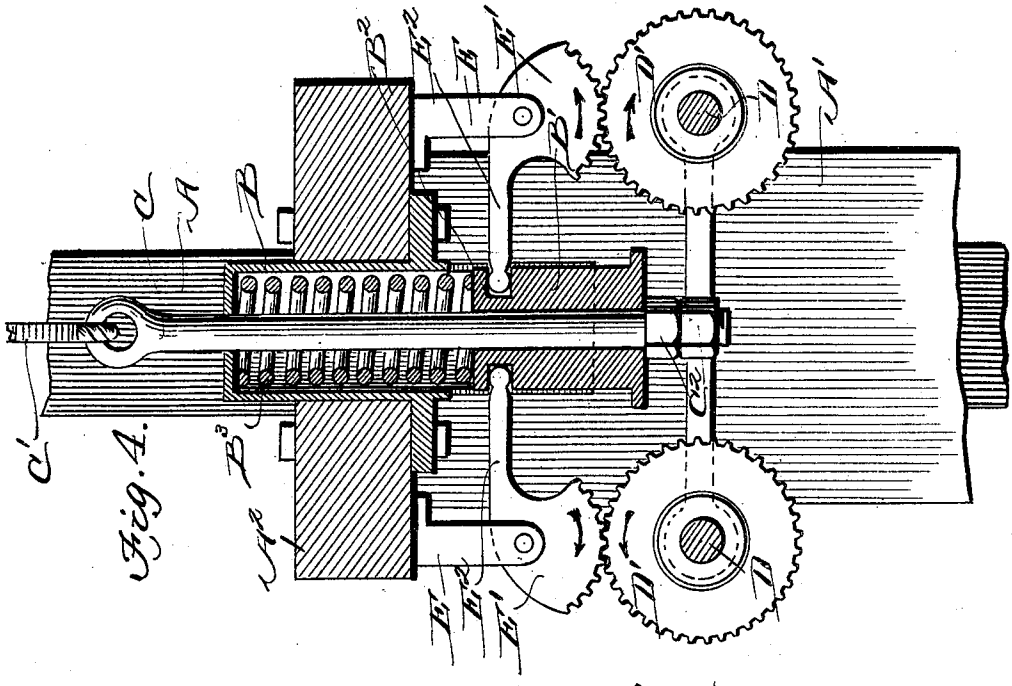


Fig. 4.

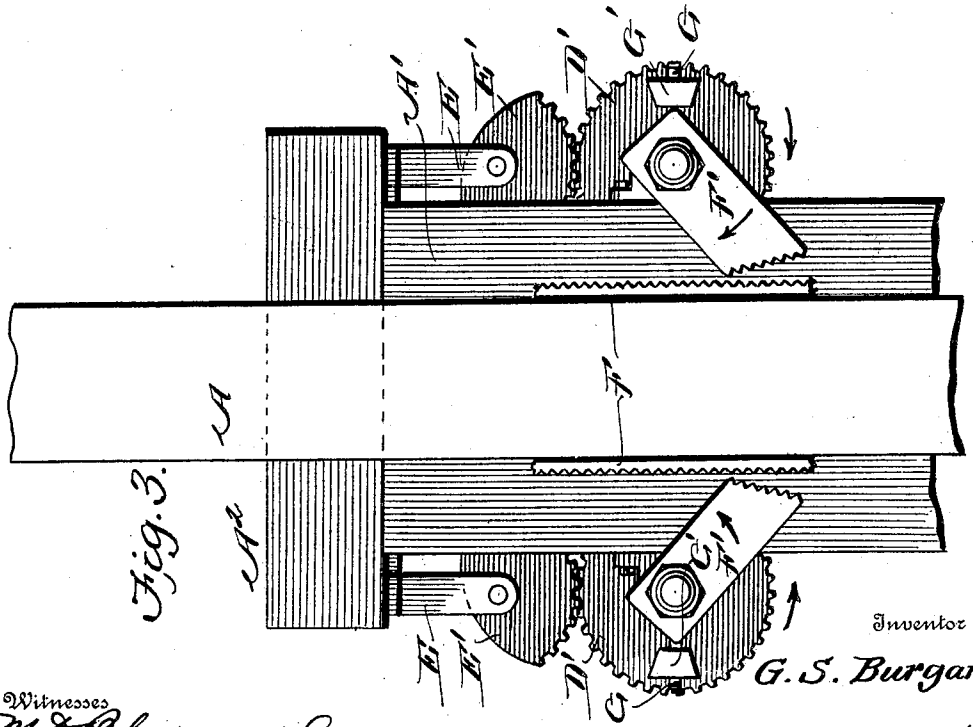


Fig. 3.

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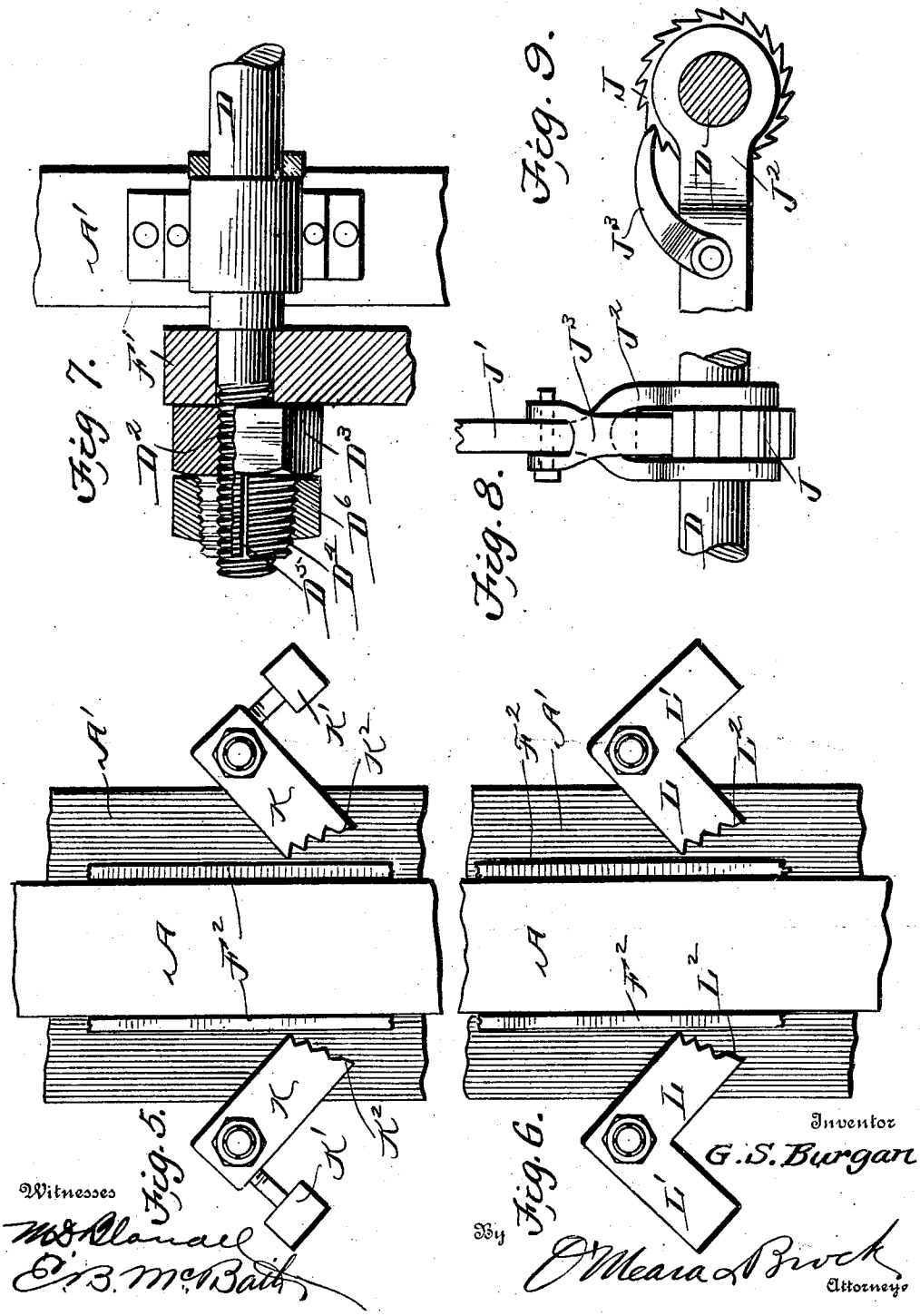
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

GEORGE S. BURGAN, OF MINERS MILLS, PENNSYLVANIA.

SAFETY DEVICE FOR ELEVATOR OR MINE CAGES.

No. 922,452. Specification of Letters Patent. Patented May 25, 1909.

Application filed August 11, 1906. Serial No. 330,167.

To all whom it may concern:

Be it known that I, GEORGE S. BURGAN, a citizen of the United States, residing at Miners Mills, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Improvement in Safety Devices for Elevator or Mine Cages, of which the following is a specification.

This invention relates to an attachment for elevators, and especially that type of elevator used in mines, the object of the invention being an automatic catch which will stop the elevator-cage upon the breaking of the hoisting cable and lock the same against any downward movement.

The invention consists of the novel features of construction hereinafter fully described, pointed out in the claims, and shown in the accompanying drawings, in which,

Figure 1 is a view in elevation of a portion of an elevator frame and guides in which the frame or cage travels, and showing in elevation my attachment. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is an end elevation of my attachment in position upon an elevator-cage. Fig. 4 is a central vertical section. Figs. 5 and 6 are detail elevations in outline illustrating slight modifications in the gripping members. Fig. 7 is a detail sectional view of the locking nut, in position upon the end of a shaft. Fig. 8 is a detail plan view of a portion of a shaft, and of certain locking mechanism carried thereby. Fig. 9 is a side view of said locking mechanism, the shaft being shown in section.

In these drawings A indicates the guides between which the elevator cage travels and A′ indicates side members of said cage connected by a center cross-bar A^2, and the said side members are recessed upon opposite sides, one of said recesses being shown at A^3. Through the cross-bar A^2 extends a sleeve B downwardly open and in the lower end portion of which works a plug B′. Adjacent its upper end the plug is provided with a circumferential groove B^2 and within the sleeve B is a coil spring B^3 which bears at its upper end upon the top of the sleeve B and at its lower end upon the plug B′. A draw bar C passes loosely through the sleeve and plug and has connected to it at its upper end a cable C′ and upon its lower end suitable jam nuts C^2, one of which bears upon the bottom of the plug B′. When the weight of the cage is upon the cable C′ the draw bar will be lifted slightly forcing the plug B′ against the spring B^3 and compressing the spring.

Shafts D are carried by the cage parallel to the cross bar A^2 and in a lower plane, the shafts being journaled in suitable bearings carried by the side members A′. Centrally fixed upon the shafts D are gear wheels D′. Hangers E are supported from the cross piece A^2 and in these hangers are pivoted toothed segments E′, which mesh respectively with the gear wheels D′ and which are provided with oppositely extending arms E^2, the free ends of which are slightly rounded and engage the groove B^2 upon opposite sides of the plug B′.

Suitable rack bars F are secured in any desired manner to the guide members A said bars being arranged upon opposite sides of the guides A. Upon the shafts D are fixed gripping members F′ which extend inwardly and downwardly and at their lower ends are provided with teeth adapted to engage the teeth of the bars F. To normally hold the gripping members in position for immediate engagement with the bars F, arms G provided with threaded portions are fixed to the shafts D and weights G′ are threaded upon said arms and by adjusting the weights with reference to their distance from the axis of the shafts, the gripping members F′ will be counterbalanced so that their toothed ends will be held adjacent the rack bars F, but slightly spaced therefrom. Brackets H are also carried by the cross bar A^2 and upon opposite sides of the sleeve B and to said brackets are pivoted intermediate their ends levers H′ and the inner ends of these levers rest in the groove B^2 while the outer ends of the levers rest in the recesses A^3.

To lock the gripping members F′ in engagement with the rack bars F and prevent any jar from disengaging them after they have been thrown into locking position and also to brace the shafts D, I provide connecting bars J′, the ends of which are bifurcated as shown at J^2, and extend around the shafts D, the said shafts rotating within the straps formed by said bifurcated ends. Ratchet wheels J are fixed to the shafts and rotated in the bifurcations J^2 and are engaged by pawls J^3 which are pivoted upon the bars J′ and these pawls prevent reverse rotation of the shafts D.

In Figs. 5 and 6 I have shown two slight modifications, showing in the Fig. 5 a grip-

ping member K, which is provided at its pivoted end with a weight K′ and the last or lowermost tooth upon said gripping member is formed with a blunt point K² which prevents the gripping member from being forced into a wooden bar F² carried by the guide A and employed in place of the metal rack bars F. It will be obvious that the counter-weight K′ fixed upon the gripping member will take the place of the arms G and weights G′. In the form shown in Fig. 6, I have omitted the counter-weight entirely by forming the gripping member of a piece of angled metal, one arm L carrying the teeth while the other arm L′ serves as the counter-weight, and the arm L is also provided with a lowermost tooth blunted as shown at L².

In Fig. 7 I have illustrated a form of lock nut for locking the shaft D in position, and in this view D² represents a threaded end of the shaft upon which is threaded a nut D³ provided with an exteriorly threaded and longitudinally split sleeve D⁴, one of the slots being shown at D⁵, and over this split or slotted sleeve is threaded a lock nut D⁶, which binds the split members of the sleeve to the threaded portion D² of the shaft.

The operation of the device is as follows:— Upon the breaking of the cable C′ the spring B³ will force downwardly the plug B′ and this will carry with it the inner ends of the arms E², thus partially rotating the segments E, and the gear wheels D′, and the shafts D in the direction shown by the arrows and also throwing the gripping members F′ in the direction shown by the arrows upon Fig. 3, and these gripping members being forced into engagement with the rack bars F, will prevent the cage from falling. At the same time the inner ends of the levers H′ will be moved downwardly and their outer ends which extend into the recesses A³ will be lifted and will be brought into binding engagement with the inner faces of the guides A and will also aid in supporting the cage. It will also be understood that when the partial rotation of the shafts D throws the gripping members F′ into engagement with the rack bars F, that reverse rotation of the shafts and consequent disengagement of the gripping members from the rack bar is prevented by the engagement of the pawls J³ with the ratchets J.

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

1. The combination with an elevator cage and of guide bars between which the cage travels, of rotatable shafts, said shafts being arranged upon opposite sides of the guide bars, gripping members fixed to said shafts, gear wheels on the shafts, a sleeve carried by the top of the cage, a plug movable therein, a draw bar working loosely through said sleeve and plug and held against withdrawal from the plug, a cable connected to the draw bar, a spring arranged in the sleeve and bearing downwardly upon the plug, pivoted segments having toothed portions in engagement with the gear wheels, and arms carried by the segments and engaged by the plug, as and for the purpose set forth.

2. In a device of the kind described, rotatable shafts, gear wheels fixed thereon, gripping members fixed to the shafts, ratchet wheels carried by said shafts, bars connecting the shafts, the ends of the bars being bent around the shafts and the shafts rotating loosely in said end portions, pawls carried by said bars and engaging the ratchets and preventing reverse rotation of the shafts, and means for giving said shafts a partial rotation in one direction upon the breaking of a cable.

GEORGE S. BURGAN.

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