No. 740,942. PATENTED OCT. 6, 1903.

W. B. STEVENSON.

SAFETY GEAR FOR MINE SKIPS, CAGES, &c.

APPLICATION FILED MAY 20, 1903.

NO MODEL.

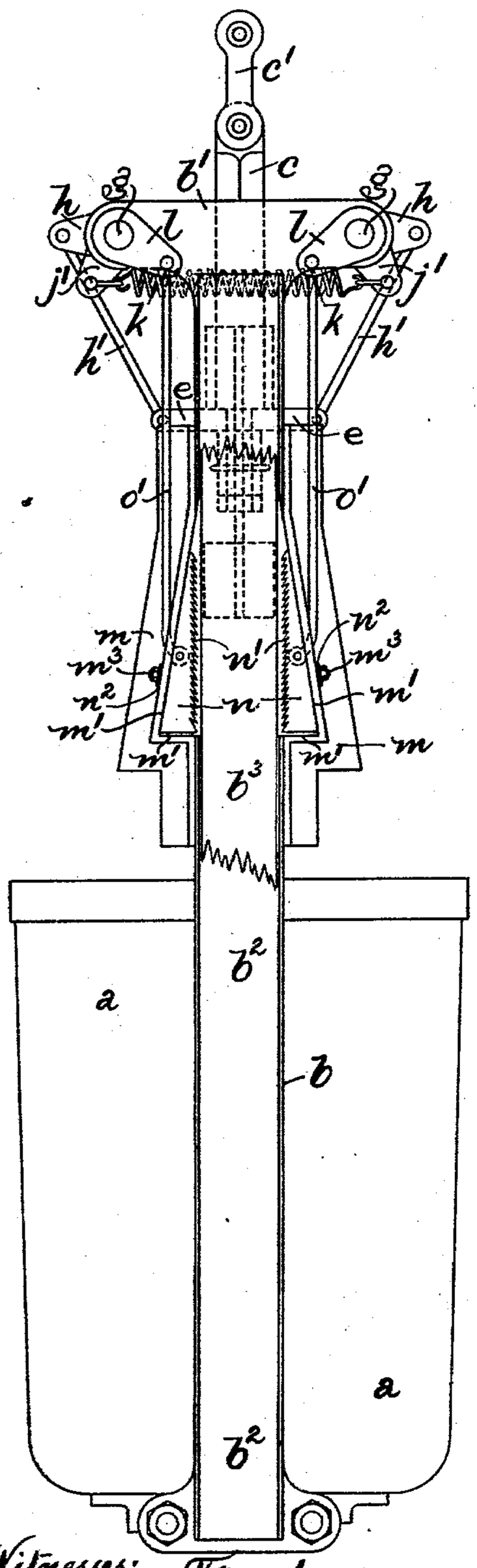


Fig. 1.

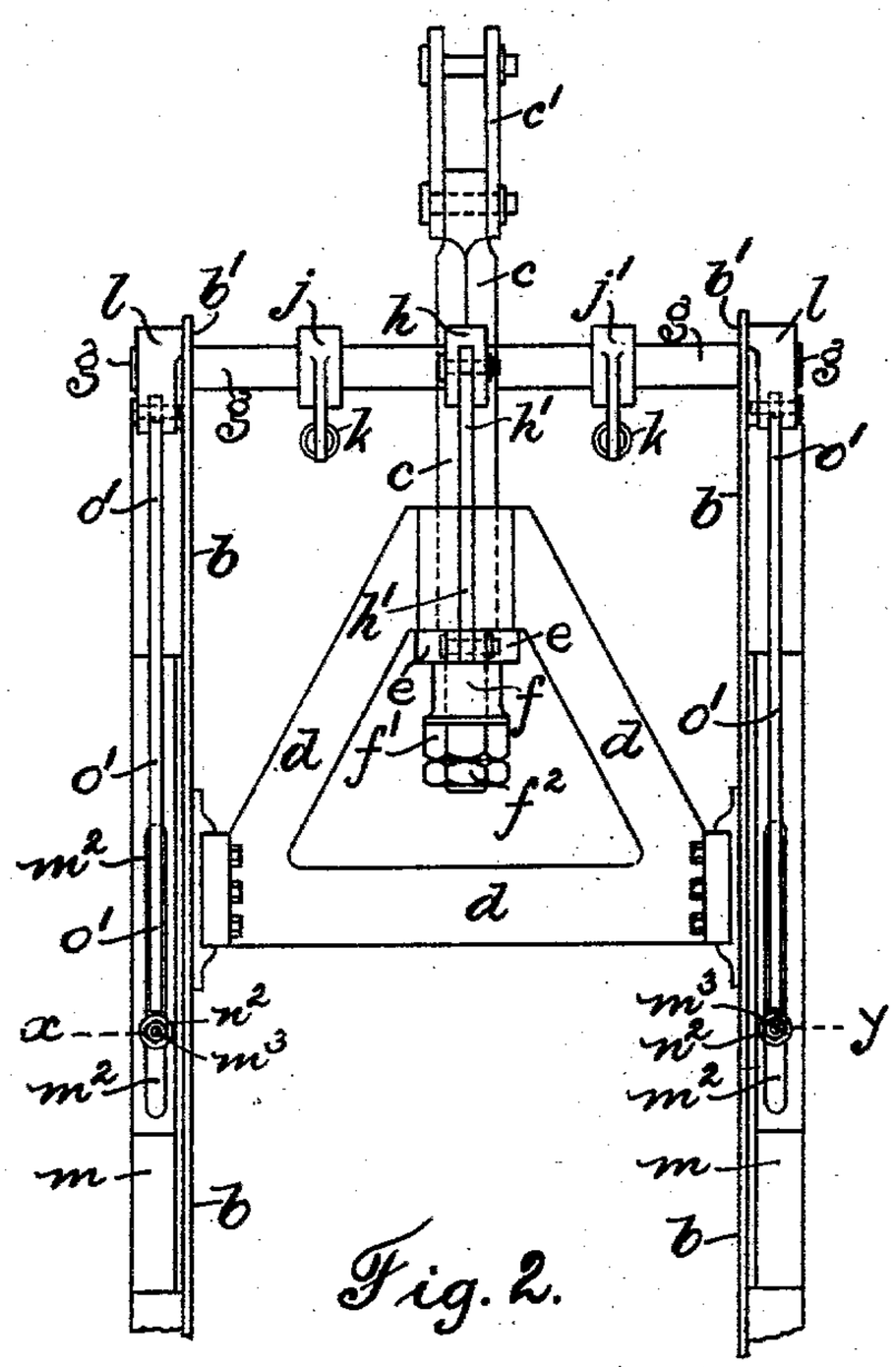


Fig. 2.

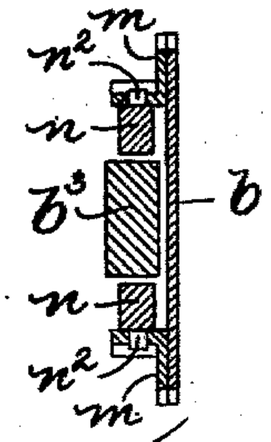


Fig. 3.

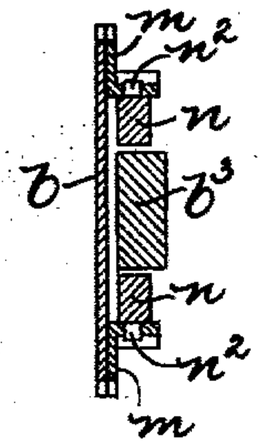


Fig. 5.

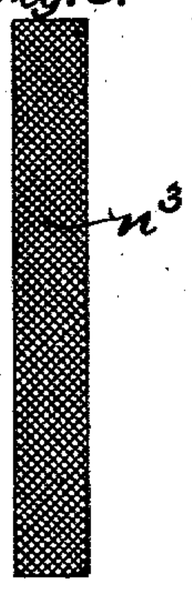
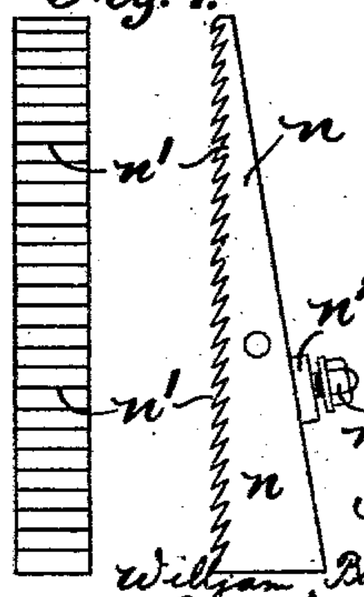


Fig. 4.



As Witnesses:
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per Chas. Brendale Agent

No. 740,942. Patented October 6, 1903.

UNITED STATES PATENT OFFICE.

WILLIAM BOWIE STEVENSON, OF WITWATERSRAND GOLD FIELDS, TRANSVAAL.

SAFETY-GEAR FOR MINE SKIPS, CAGES, &c.

SPECIFICATION forming part of Letters Patent No. 740,942, dated October 6, 1903.

Application filed May 20, 1903. Serial No. 157,906. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BOWIE STEVENSON, a subject of the King of Great Britain, residing on the property of the Nourse Deep Gold Mining Company, Limited, Witwatersrand Gold Fields, Transvaal, have invented certain new and useful Improvements in Safety-Gear for Mine Skips, Cages, and the Like, of which the following is a specification.

The object of my invention is to provide safety-gear mechanism for mine skips and hoists and elevating devices of like character always sure to act and which when acting will reduce the shocks and jerks to a minimum.

Said invention is fully shown in the following specification, of which the accompanying drawings form a part, wherein similar letters of reference designate like or equivalent parts wherever found throughout the several views, and in which—

Figure 1 shows in side elevation a skip and its supporting-frame provided with my improved safety-gear. Fig. 2 is a front view of the safety-gear shown in Fig. 1, the skip being omitted. Fig. 3 is a section on line $x\ y$, Fig. 2. Fig. 4 shows one of the dog-wedges or catches detached designed for use with wooden guides or runners, and Fig. 5 shows the gripping-face of one of the dog-wedges or catches designed for use with metal guides or runners.

a is the skip, and b its supporting-frame, to which it is attached at the lower extremity.

c is the draw-bar, and d is the cross-head, which latter forms the connection between the frame b and the draw-bar c.

c' is the shackle to which the hauling-rope is attached.

The draw-bar c at its lower end passes through the top of the cross-head d and is free to move vertically therein within certain limits.

On the portion of the draw-bar c beneath the top of the cross-head d is arranged a plate or collar e, and below the plate e is a sleeve f. A nut f' is screwed onto the extremity of the draw-bar c up to the sleeve f to keep the parts in position, and f^2 is a lock-nut.

In the top of the frame b and on opposite sides of the draw-bar c is arranged a rod g, which is capable of rotating in its bearings in said frame. At the center of each of the rods g is keyed or otherwise suitably fixed a lever or wiper h. The wipers h are connected with the plate or collar e at each side of the draw-bar by means of rods h'. The rods h' are pivotally attached to the extremities of the wipers h and the ends of the plate e.

One ach of the rods g, between the extremities thereof and the wipers h, are fixed two other levers or wipers $j\ j'$. The extremities of the two oppositely-arranged wipers j and the two opposite wipers j' are connected by means of strong spiral springs k. The extremities of the rods g project beyond the back plate b' of the frame b at each end, and on their outer ends wipers or levers l are fixed.

The frame b forms a recess or groove b^2, into which the guides or runners b^3 of the shaft project.

To the frame b above the skip a are bolted, riveted, or otherwise conveniently affixed angular brackets or straps m, which form guides or slides for the catches or dog-wedges n. The containing and guiding straps m form internal angular recesses m' between the runners b^3 and the frame. The dog-wedges are inclined or shaped at the back to fit the angular recesses m'. The front faces of the wedges or catches n, which are vertical and parallel with the sides of the guides or runners b^3, are serrated or provided with gripping-teeth n' on the vertical face or edge. (See Fig. 4.)

In the straps m longitudinal slots m^2 are formed, and in the back or inclined face of the wedges n studs or projections n^2 are provided, which project through the slots m^2. On the ends of the studs or projections n^2 beyond the slots m^2 are fitted nuts m^3. This arrangement compels the dog-wedges n when they are operated to move so that their toothed faces or edges always remain vertical and parallel with the edges of the runners or guides b^3.

The wipers l on the extremities of the rods g are connected with the dog-wedges n by means of rods o', which rods are pivotally connected with the wipers at one end and at the other end pass through the slots m^2, and are pivotally connected with the dog-wedges inside the angular containing-straps m. Instead of using rigid rods, such as o', I may employ a rope or chain in substitution therefor.

It will be observed that the dog-wedges n present a large serrated or toothed surface to the sides of the runners b^3 and that as they slide or are drawn up in the straps m they are forced inward and the serrated or toothed surface n' maintained truly parallel with the sides of the guides or runners.

In Fig. 5, in which one of the dog-wedges or catches is illustrated designed for use with metal guides or runners, the gripping-face n^3 is formed by cross-cuts, leaving the face with a file-like surface, which comes into contact with or bears against the sides of the runners when the wedges or catches are brought into operation.

The action of the gear or mechanism is as follows: In the drawings the several parts are shown in the position they assume when the skip is suspended by means of the hauling-rope. The plate e is supporting the cross-head d, the spiral springs k are in tension, and the wedges or catches n are at the bottom of the recesses m' and running clear of the guides or runners. Should the hauling-rope break, the draw-bar c would drop down in the top of the cross-head, so that the plate or collar e would draw down the wipers h through the medium of the rods h'. At the same time the spiral springs k would contract and draw inward the ends of the wipers $j\,j'$. The movement of the wipers h and $j\,j'$ would rotate the rods g in their bearings in the frame b. The rotation of the rods g would turn the wipers l, and the movement of said wipers would raise the wedges or catches n through the medium of the rods o'. As the wedges are drawn up the backs or inclined faces slide in the angular recesses formed by the containing and guiding straps until their toothed surfaces are brought into contact with the sides of the runners or guides and penetrate the same, and thereby arrest the movement of the skip. The whole weight being now thrown onto the opposing inclined surfaces of the wedges and their containing-straps, the tendency of the load will be to jam the wedges the more tightly against the sides of the runners or guides.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. In a safety-gear of the nature indicated the combination with the skip or cage and its supporting-frame of the containing and guiding straps having longitudinal slots formed therein fitted to the frame and forming angular recesses at each side of the guides or runners, the dog-wedges or catches arranged in said angular recesses and each provided with a vertical serrated or toothed gripping-surface parallel with the guides or runners, studs or projections on the backs or inclined surfaces of the dog-wedges or catches projecting into the slots in the straps to retain the catches in position and to compel the gripping-surfaces thereof to move parallel with the guides or runners, and means for raising the wedges or catches in their containing and guiding straps should the skip or cage become unsuspended, substantially as described.

2. In a safety-gear of the nature indicated the combination with the skip or cage and its supporting-frame of the containing and guiding straps fitted to the supporting-frame and forming angular recesses at each side of the guides or runners, the dog-wedges or catches each provided with a vertical serrated or toothed gripping-surface arranged in said angular recesses in such manner that when raised the gripping-surfaces move inward and parallel with the sides of the guides or runners, and means for raising the dog-wedges in the straps should the skip become unsuspended said means comprising rods or spindles journaled in the upper portion of the frame at each side of the cross-head, wipers fixed to the spindles and attached to the draw-bar by means of rods so that as the draw-bar falls in the cross-head the spindles may be rotated, wipers fixed to the spindles and connected in pairs by spiral springs, and wipers fixed on the extremities of the spindles and attached to the wedges or catches by means of rods, so that as the spindles are rotated by the springs when the draw-bar falls in the cross-head the wedges or catches are raised in the containing and guiding straps, substantially as described.

3. In a safety-gear of the nature indicated, in combination, the skip a and its supporting-frame b, the brackets or straps m forming the angular recesses m' at the sides of the guides or runners, and having the longitudinal slot m^2, the dog-wedges or catches n arranged in said recesses m', the vertical serrated or toothed gripping-surface n' of the wedges or catches n parallel with the guides or runners, the studs or projections n^2 formed on the backs or inclined surfaces of the dog-wedges n projecting into the longitudinal slots m^2, the draw-bar c plate or collar e and cross-head d, the rods or spindles g journaled in the upper portion of the frame at each side, the wipers h fixed on the spindles g and the rods h' pivotally connected at one extremity with the wipers h and at the other extremity with the plate or collar e, the wipers $j\,j'$ on the spindles g and the spiral springs k attached to the two pairs of the wipers $j\,j'$, the wipers l fixed to the extremities of the spindles g beyond the frame and the rods o' pivotally attached to the wipers l at one extremity and at the other extremity projecting through the longitudinal slots m^2 and pivotally attached to the dog-wedges or catches n, substantially as and for the purposes described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM BOWIE STEVENSON.

Witnesses:
CHAS. OVENDALE,
J. SCRIMGEOUR.