

W. B. Culver,

Elevator,

No 84,939,

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Fig. 1

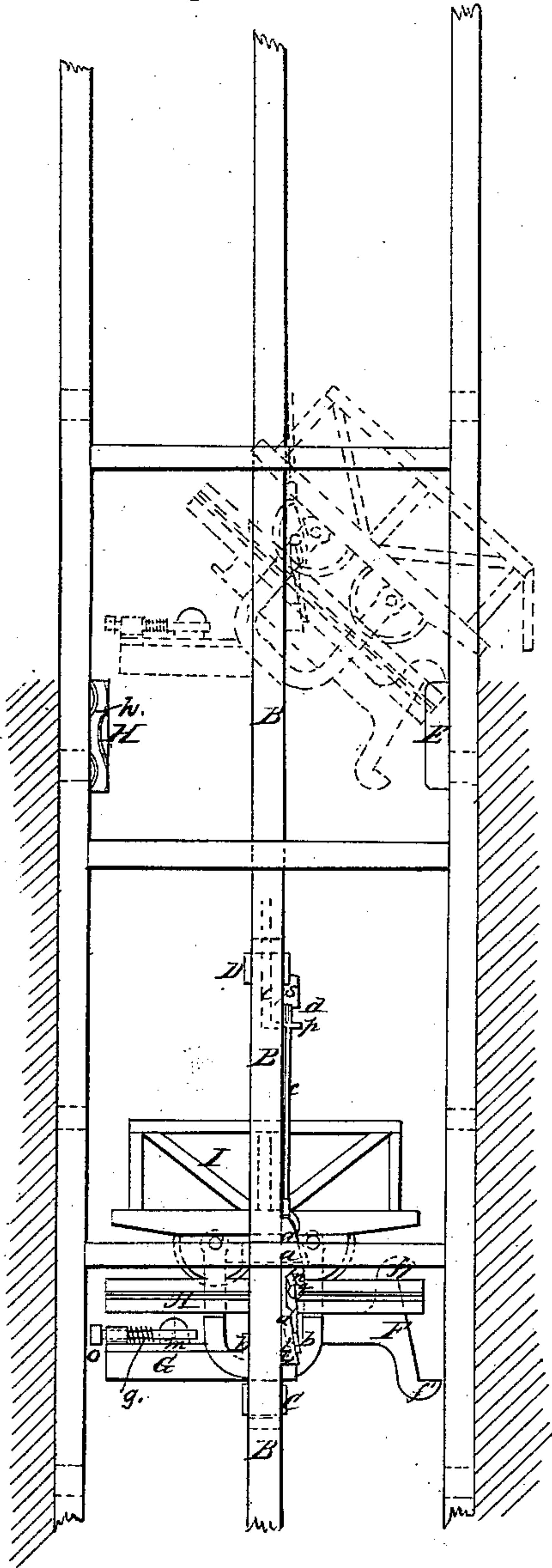
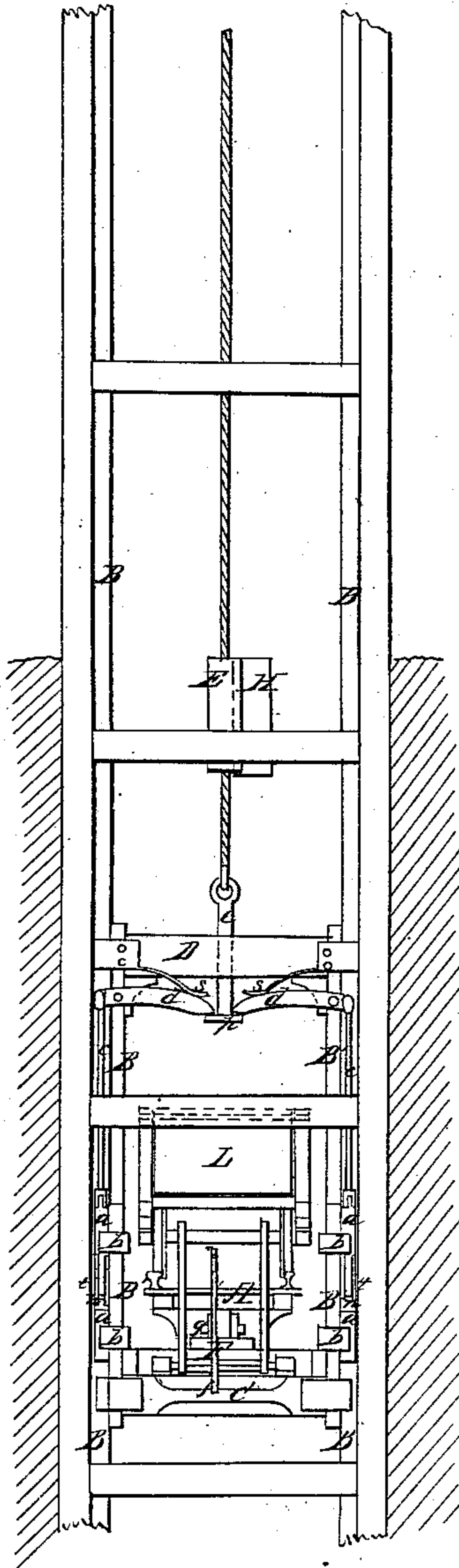


Fig. 2.



Witnesses.

J. S. L. L. L.
A. L. L. L.

Inventor.

W. B. Culver
per Brown, Loomis & Co.
Attys

United States Patent Office.

W. B. CULVER, OF SCRANTON, PENNSYLVANIA.

Letters Patent No. 84,939, dated December 15, 1868.

IMPROVEMENT IN HOISTING AND DUMPING-APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, W. B. CULVER, of Scranton, in the county of Luzerne, and State of Pennsylvania, have invented a new and useful Improvement in Safety Hoisting and Dumping-Apparatus; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention is more especially designed for use in coal and other mines, but is equally applicable for all purposes where a hoisting and dumping-apparatus is required, and is in part applicable to hoisting-apparatus not constructed or arranged for dumping; and

It consists in the arrangement of stationary and moving dumping-projections, attached, respectively, to the frame and platform, whereby the contact of the one against the other causes the dumping of the platform.

It furthermore consists in the arrangement, upon the moving parts of the apparatus, of a locking-bolt, operated by a stationary guide, whereby the locking and unlocking of the platform are produced by the sliding of the same.

Referring to the drawings—

Figure 1 represents a side-elevation view of a safety hoisting and dumping-apparatus, constructed according to my invention, and

Figure 2, an end elevation of the same.

Similar letters of reference indicate corresponding parts in both figures.

A is a pivoted platform, arranged to slide vertically within suitable framing sunk in a shaft of a mine, but may be placed in any location where a hoisting or dumping-apparatus is required.

B B are vertical guide-posts, secured to the frame, upon each side of the platform A, for the purpose of guiding the same in its upward and downward movement.

Attached to the said platform A, and with their outer surfaces in immediate contact with the inner surfaces of the vertical guides B B, are vertical sliders B' B'.

These sliders B' B' are connected, at their lower extremities, by a cross-piece, C, upon which the platform A is pivoted, and at their upper ends, by a cross-piece, D, so that a hoisting-rope, O, attached to the central portion of said upper cross-piece D, and with an upward tension produced by sufficient application of power above, will cause the raising of the platform.

Secured to said vertical sliders B' B', and so as to clasp the lateral surfaces of the guides B B, is any desirable number of sliding jaws, b, for guiding these sliders in their upward and downward movements.

Upon the platform A suitable provision is made for receiving and retaining a car, L, for containing the material to be hoisted and dumped.

The above-described points are more or less after the ordinary construction of hoisting-apparatus, but my improvement consists more particularly in the arrangement, between the sliding jaws b and guides B, of mov-

able wedges a. Said wedges are of upward-taper form, and designed for so engaging between the said parts, in the event of breakage of the rope, as to prevent the sliding of the one upon the other.

Connected to the upper extremities of these wedges a are connecting-rods c c.

Said rods c are upwardly passed along the sliders B', and made to connect with the outer extremities of horizontal levers d d.

These levers d are pivoted to the lateral surface of said sliders B', so that their inner ends converge and nearly meet at a central point, near the under side of the upper cross-piece D.

Immediately above these levers d are springs s s, which are intended to exert a downward pressure upon the inner ends of the levers d.

Passing perpendicularly through the central portion of the cross-piece D is a sliding bolt or rod, e, with a ring at its upper extremity, for connection thereto of the hoisting-rope O.

From the lower extremity of this rod e, and directly under the converging ends of the levers d, projects horizontally a foot, p, so that the upward sliding of the bolt or rod e through the cross-piece D causes the elevation of the inner ends of the levers d, by means of said projecting foot p.

The ends of the levers d d may be connected by links to the sliding rod e, or by any other suitable connection, so as to be raised by the tension of the rope.

The upward movement of the inner ends of the levers d d causes a depression of the connecting-rods c c, by means of their connection with the opposite ends of the said levers, and thereby causing the downward sliding of the wedges a a, which, by nature of their upward-taper form, cease to bind between the jaws b and guides B as they are downwardly forced; and while being thus downwardly forced, are or may be forced off from the surface of the guide posts B, by means of inclined notches n, provided in the wedges a, working over fixed guide-pins or screws t in the sliders B'.

Within the wedges a are provided suitable excavations or cavities, which are also of an upward-taper form, and designed for reception of rollers i i.

These rollers i are arranged within these tapering cavities in such manner as that their peripheries may be in position to engage with the surfaces of the guide-posts B, and the back or tapering sides of said tapering cavities, whenever said wedges, by the breaking of the rope, are permitted to be drawn upward by the action of the springs.

The excavated or inner surfaces of the wedges, by means of their inclined or taper construction, engage more closely with the peripheries of the rollers, as they are caused to pass over the same in a downward direction; and the breaking of the rope and the falling of the platform cause the said rollers i, by the upward tendency of the wedges, and the downward pressure of the sliding jaws b, to engage so closely with the

outer surface of the guide-post and the inner surface of the wedges *a* as to effectually prevent the sliding of the one over the surface of the other.

These rollers *i* are loosely arranged within the cavities of the wedges *a*, but may be suspended therein upon axles rotating within inclined slots cut in the said wedges, so as to allow the said rollers *i* a nearly vertical-sliding motion, as well as a rotating motion, and so as to keep their peripheries, at all elevations of the roller within the said cavities, in contact with the back or inclined surfaces of said cavities.

The peripheries of said rollers *i*, instead of being constructed plain or smooth, may be roughened, or provided with corrugations or cogs, and corresponding corrugations or cogs to gear therewith, provided upon the back or inclined surfaces of the cavities in which they are arranged, for the purpose of insuring a more certain engagement and disengagement between said parts when necessary.

E is a stationary dumping-projection, secured to the frame of the apparatus, and consisting of a vertically-arranged block, with its upper extremity terminating even with the surface of the ground or other surface upon which the material being hoisted is intended to be dumped.

F is a moving dumping-projection, secured to the under side of one end of the platform, and in the same perpendicular line as the stationary projection E, and designed for engaging therewith in the upward and downward movements of the platform.

This projection F is provided, upon its extremities, with outwardly-extending spurs *f f'*, and is arranged in a nearly vertical position, being inwardly inclined towards its upper extremity when the platform is level, so as in the upward passage of the platform to cause its upper spur, *f*, to clear the projection E, and the lower spur, *f'*, to engage with the lower extremity of the same, thereby to cause the dumping of the platform.

The dumping of the platform A causes the inclined position of the dumping-projection F to be reversed, so that in the downward passage of the said platform, the lower spur, *f'*, of the projection F will clear the stationary projection or dumping-block E, while the upper spur, *f*, will engage with the upper end of said block, as illustrated in red outline in fig. 1, and cause the readjustment of the said platform.

G is a smaller platform, arranged under the platform A, and rigidly secured to the sliding parts of the apparatus, so as to slide with the larger platform A, but without partaking of its tilting nature.

Secured upon this platform G is a locking-bolt, *g*, arranged to slide horizontally thereon, and is or may be provided with a spiral or other spring-attachment, to keep it in place.

The platform A is locked, and its tilting prevented by means of the engagement of the inner extremity of the locking-bolt *g* with a projection, *m*, upon the under side of said platform A.

The locking-bolt *g* is provided, near its outer end, and transversely thereto, with a horizontally-arranged projection or stud, *o*, for a purpose hereinafter explained.

H is a grooved block, vertically arranged, and secured to the frame at a point opposite the stationary dumping-block E, and on a level with the same, and within the perpendicular line of motion of the horizontal projection or stud *o*, near the end of the locking-bolt *g*.

Said block H is provided, upon one of its sides, with a groove, *h*, so that in the upward and downward movements of the platform A, the said stud *o* is caused to pass longitudinally through the said groove *h*.

This groove *h*, instead of being straight, is of an outwardly-curved or bowed formation, at or about its central portion, so that the stud *o*, in following the direction of said groove *h*, will be carried out of its perpendicular line of motion, causing the locking-bolt *g* to be drawn backward and out of lock with the projection *m*, thereby unlocking the platform at the point where it is ready to be dumped, but allowing it to be locked at all other points of elevation within the frame.

The operation of the invention is such that when the hoisting-rope breaks, the springs *s s*, with a motion quicker than the action of gravity, draw the wedges *a* upward, and wedge them between the surfaces of the guide-posts B and the sliding jaws *b*, while said jaws *b*, caused by the falling of the platform, slide down upon the inclined or taper surfaces of the wedges with a force proportionate to the weight of the platform with its load, thereby producing a jamming or wedging of the parts upon the guide-posts B sufficient to arrest, in ordinary cases, the further downward sliding of the platform. But if this wedging of said parts be insufficient to arrest the fall, and the wedges *a* are carried downward by the sliding jaws *b*, said wedges, by means of their now closer proximity to the guide-posts, will have brought the peripheries of the rollers *i* in firm contact with the surfaces of the guide-posts on the one side, and the back or taper side of their inner surfaces on the other side, so that a downward sliding of the wedges *a* will produce an upward rolling of the rollers *i* within the cavities, thereby, by means of the upward-taper formation of said cavities, causing a firmer wedging of the parts, and the effectual arrest of the platform.

The car is loaded, and the platform hoisted in the ordinary way.

When the platform has nearly reached the point at which it is to be dumped, the stud *o*, near the end of the locking-bolt *g*, enters the groove *h* in the stationary block H, and, by following the outwardly-curved formation of said groove *h*, withdraws the inner end of the said locking-bolt *g* from above the projection *m*, thereby unlocking the platform.

When the locking-bolt *g* is thus withdrawn, the lower spur, *f'*, of the dumping-projection F, by means of the continued ascent of the platform, engages with the under side of the dumping-block E, and causes the dumping of the platform.

The descent of the platform causes the spur *f*, on the upper extremity of the dumping-projection F, to engage with the upper end of the dumping-block E, thereby readjusting the platform as it descends the shaft.

The platform is again locked by the downward passage of the stud *o* through the groove *h*.

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

1. The sliding rod *e*, springs *s*, levers *d*, connecting-rods *c*, and wedges *a*, with rollers *i* arranged therein, all arranged, with relation to each other and to the hoisting-apparatus, substantially as described and for the purpose herein set forth.

2. The stationary and moving dumping-projections E and F, in combination with the hoisting and dumping-apparatus, all arranged and operating in the manner substantially as herein described.

3. The locking-bolt *g*, projection *m*, and grooved block H, in combination with each other and with a hoisting-apparatus, substantially as described and for the purpose herein set forth.

W. B. CULVER.

Witnesses:

GEO. L. DICKSON,
WM. H. PERKINS.