(No Model.)

W. F. BATH.

REGISTERING AND INDICATING DEVICE FOR MINES, &c.

No. 412,586. Patented Oct. 8, 1889.

FIG. 2.

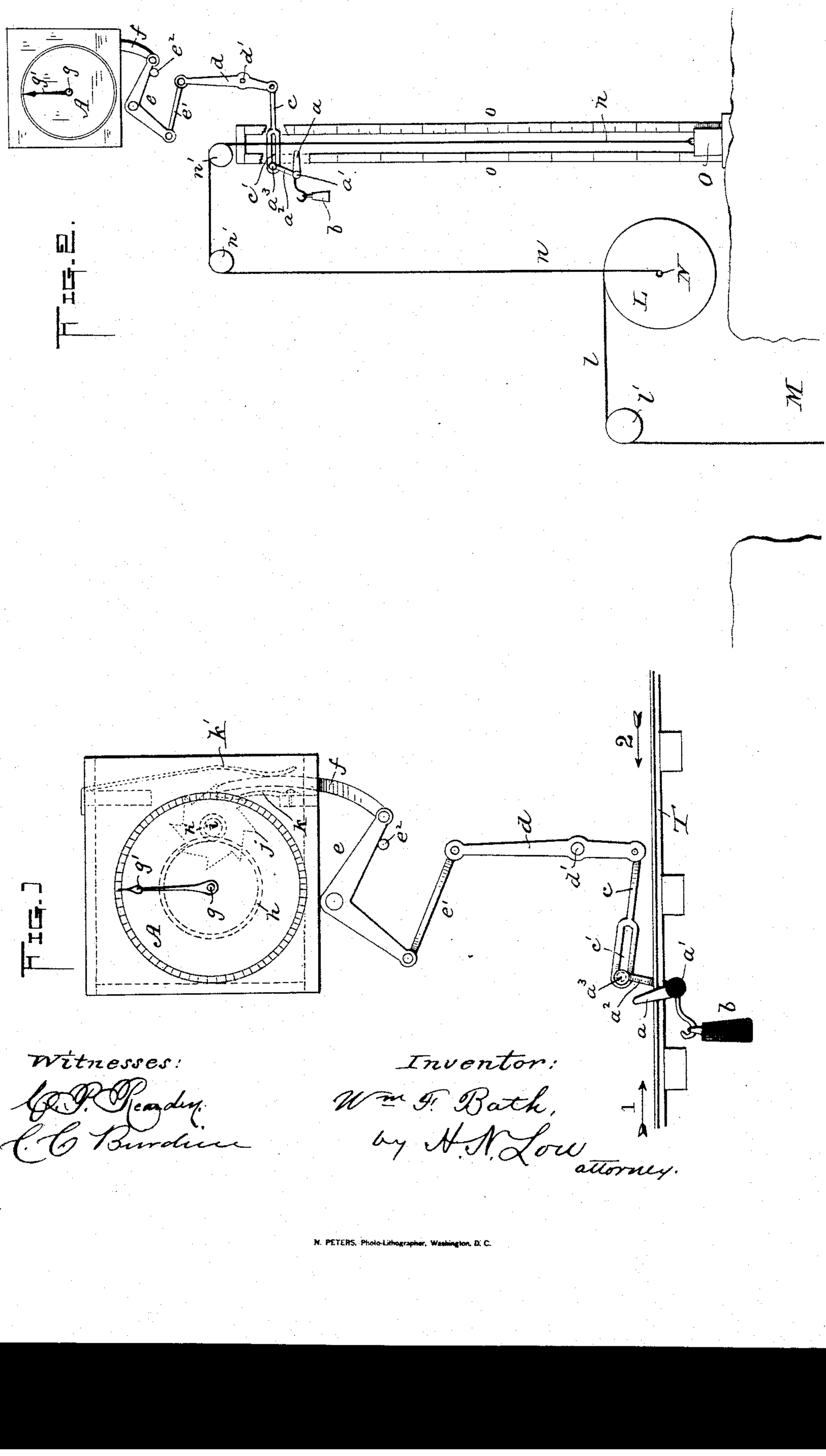

FIG. 1.

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UNITED STATES PATENT OFFICE.

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REGISTERING AND INDICATING DEVICE FOR MINES, &c.

SPECIFICATION forming part of Letters Patent No. 412,586, dated October 8, 1889.

Application filed July 3, 1889. Serial No. 316,411. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BATH, a citizen of the United States, residing at Wardner, in the county of Shoshone and Territory of Idaho, have invented certain new and useful Improvements in Registering and Indicating Devices for Mines and other Purposes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

It is the object of my invention to produce a registering device of simplified and inexpensive character, by which the number of cars, cages, or buckets which are run out or hoisted from a mine may be accurately registered.

A further feature of my invention consists in means, combined with the registering device, when applied to a cage or bucket which is withdrawn from the mine by hoisting, for accurately denoting the position of the cage in the shaft.

With such objects in view my invention consists in certain parts and combinations thereof hereinafter particularly set forth and claimed.

In order to make my invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect.

In said drawings, Figure 1 is an elevation of an apparatus embodying my invention applied to the registering of cars moving upon a horizontal or inclined track. Fig. 2 is a similar view showing my improved registering mechanism as applied to the registering of the passage of cages or buckets in a vertical shaft, and combining, also, means whereby the position of the cage in the shaft is signaled.

Referring to the drawings, A indicates a dial register, comprising a dial suitably divided into numbered spaces, a hand g', mounted upon a shaft g concentric with the dial, a large gear-wheel h, fixed upon and adapted to actuate the shaft g, a counter-shaft i and small pinion h' thereon, meshing with gear h, and a ratchet-wheel j, fixed on said counter-shaft.

K is a spring-arm fixed to the register frame or case and bearing at its free end upon the ratchet-wheel j, so as to prevent its backward movement.

f is a reciprocating bar or dog engaging by its free end the ratchet j, and pivotally mounted at its other end upon a vertically-oscillating arm of a bell-crank lever e. e^2 is a stop or pin which limits the backward or downward movement of said lever. The other arm of said lever, which oscillates horizontally, or substantially so, is connected by a link e' with the upwardly-extending arm of a substantially vertical lever d, which is mounted upon the fixed pivot or axis d'.

c is a link or connecting-rod pivoted to the lower arm of lever d and extending horizontally therefrom. This link is formed with a horizontally-extending slot c', in which is mounted a transverse pin a^3, carried by an arm a^2. The latter is fixed to a horizontal rock-shaft a', which is also provided with an upwardly-extending arm a. A weight b, secured upon one side of the rock-shaft or other suitable device, tends constantly to turn said shaft in such direction as to keep pin a^3 in and against one end of slot c'.

As seen in Fig. 1, T indicates a track or rail upon which the car (not shown) travels as it leaves the mine in the direction indicated by arrow 2. Such car will be provided with a projection or arm of any suitable character adapted to strike and depress arm a as the car moves along the track. If the car be moving from the mine—*i. e.*, in the direction of arrow 2—the depression of arm a will rock the shaft a', oscillate arm a^2, cause pin a^3 to draw link c to the left, (of the drawings,) oscillate lever d, draw link e' to the right, oscillate lever e, and force dog f upward. The latter, being kept in engagement with ratchet j by the spring k', will cause the ratchet to turn one tooth, and the registering-hand g', through mechanism already described, to advance one space upon the dial, indicating that one car has passed out. As soon as the car has passed, the gravitating effect of the dog f and horizontal arm of lever e, one or both of which parts are made heavy for the purpose, causes the other lever and rock-shaft a' to resume their normal positions.

When a car returns in the direction indicated by arrow 1, arm *a* will be depressed; but in this case the pin a^3, traveling in slot *c'*, will meet with no resistance, and lever *d*, and consequently the dog *f*, will not be disturbed.

Referring to Fig. 2, L indicates a drum adapted to wind up a rope *l*, which passes over a pulley *l'*, and down the shaft M to a cage or bucket. (Not shown.) Upon an extension of the axis of drum L is formed or mounted a small spindle N, upon which is secured and adapted to be wound up a cord *n*. Said cord passes over pulleys *n'* to a weight O, mounted or held in guides *o*. Said weight is situated beneath the arm *a* of the mechanism already described, the arm in this case being inclined at an angle or arranged horizontally instead of being vertical, as in Fig. 1. The winding up of the cage by the drum L and rope *l* thus is accompanied by a winding up of cord *n*, (though more slowly and through less space,) which raises the weight O and causes it to actuate arm *a* and turn the hand of register A one space, in a manner already described. Upon the descent of the bucket or cage and of weight O the latter will oscillate arm *a* without affecting the register. At one side of the weight O, upon one of its guide-rails or other suitable surface, is marked a scale of spaces or characters indicating the different levels of the mine which communicate with shaft M, or subdivided and numbered to show depths in feet. As the weight O approaches and passes these marks or numbers the situation of the cage relative to the different levels, or to the bottom or to the top, or its depth in the shaft, is indicated and ascertained by a glance. Such indicator and register will be placed in the office of the superintendent or engine-room, or both, as may be desired.

It will be understood that my improvements may be employed in other situations and for other purposes to which they are adapted besides those which, for the purpose of explaining my invention, I have herein illustrated.

Having thus described my invention, what I claim is—

1. In a register, the combination, with the registering mechanism proper, of a hoisting-drum and a cord and weight connected and adapted to move therewith, said weight having its path in proximity to and adapted to engage and operate a part connected with the registering mechanism, substantially as set forth.

2. In a combined register and indicator, the combination, with the register proper, of a hoisting-drum, a cord and weight connected and adapted to move therewith, said weight engaging a part connected with the registering mechanism, and a scale situated by the path of the weight, substantially as set forth.

3. In a registering mechanism, the combination, with the register proper, of a reciprocating and oscillating bar or dog *f*, a lever *e*, carrying the same, a rock-shaft *a'*, adapted to be rocked by the movement of the object to be registered, an arm a^2 on said shaft and provided with a pin a^3, a connecting rod or link *c*, having a slot engaged by said pin, and connections between said lever *e* and link, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM F. BATH.

Witnesses:
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