C. O. RICHARDSON.

INDICATORS FOR MINING-SHAFTS.

No. 193,462. Patented July 24, 1877.

Fig. 1.

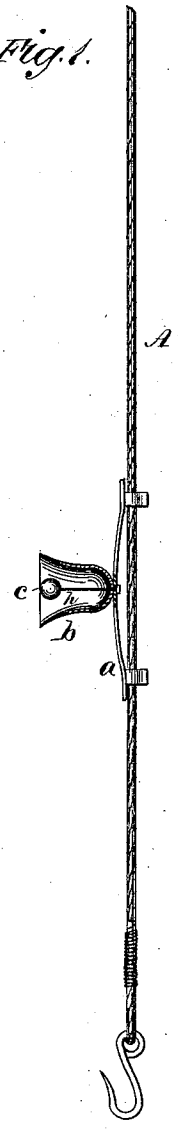
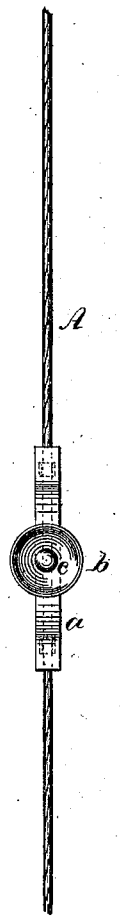


Fig. 2



WITNESSES:

Francis McArdle.

J. H. Scarborough.

INVENTOR:

C. O. Richardson.

BY

ATTORNEYS

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UNITED STATES PATENT OFFICE.

CALVIN O. RICHARDSON, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN INDICATORS FOR MINING-SHAFTS.

Specification forming part of Letters Patent No. **193,462**, dated July 24, 1877; application filed June 11, 1877.

To all whom it may concern:

Be it known that I, CALVIN O. RICHARDSON, of the city and county of San Francisco and State of California, have invented a new and Improved Indicator for Mining-Shafts, of which the following is a specification:

Figure 1 is a side elevation of my improved indicator, and Fig. 2 is a front view.

Similar letters of reference indicate corresponding parts.

In the drawing, *a* is a bar to which the bell *b* is bolted in a horizontal position. C is the clapper of the bell, which is supported by a spring shank or arm, *h*, which permits the clapper to vibrate freely when the bell is moved.

The bar *a* is fastened to the hoisting-rope A of the mining-shaft by means of clips or by lashing it with cords.

My invention consists of a bell having a spring tongue or clapper that vibrates easily, so that when the bell is attached to the hoisting-rope of a mining-shaft, and the tub or cage descending, the clapper will strike the bell when there is a slight checking or variation in speed, which is caused by the momentum of the clapper overcoming the slight resistance of the spring-tongue. Thus warning is given of the descent of the cage or tub. A more violent ringing is caused as the tub approaches the bottom, by the brakesman making a few sudden pressures upon the brake, thus warning the workmen to stand from under.

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

The bell *b*, secured to the bar *a*, and containing the spring-clapper C, combined with a hoisting-rope, substantially as and for the purpose herein shown and described.

CALVIN O. RICHARDSON.

Witnesses:
E. H. THARP,
JOHN F. MYERS.