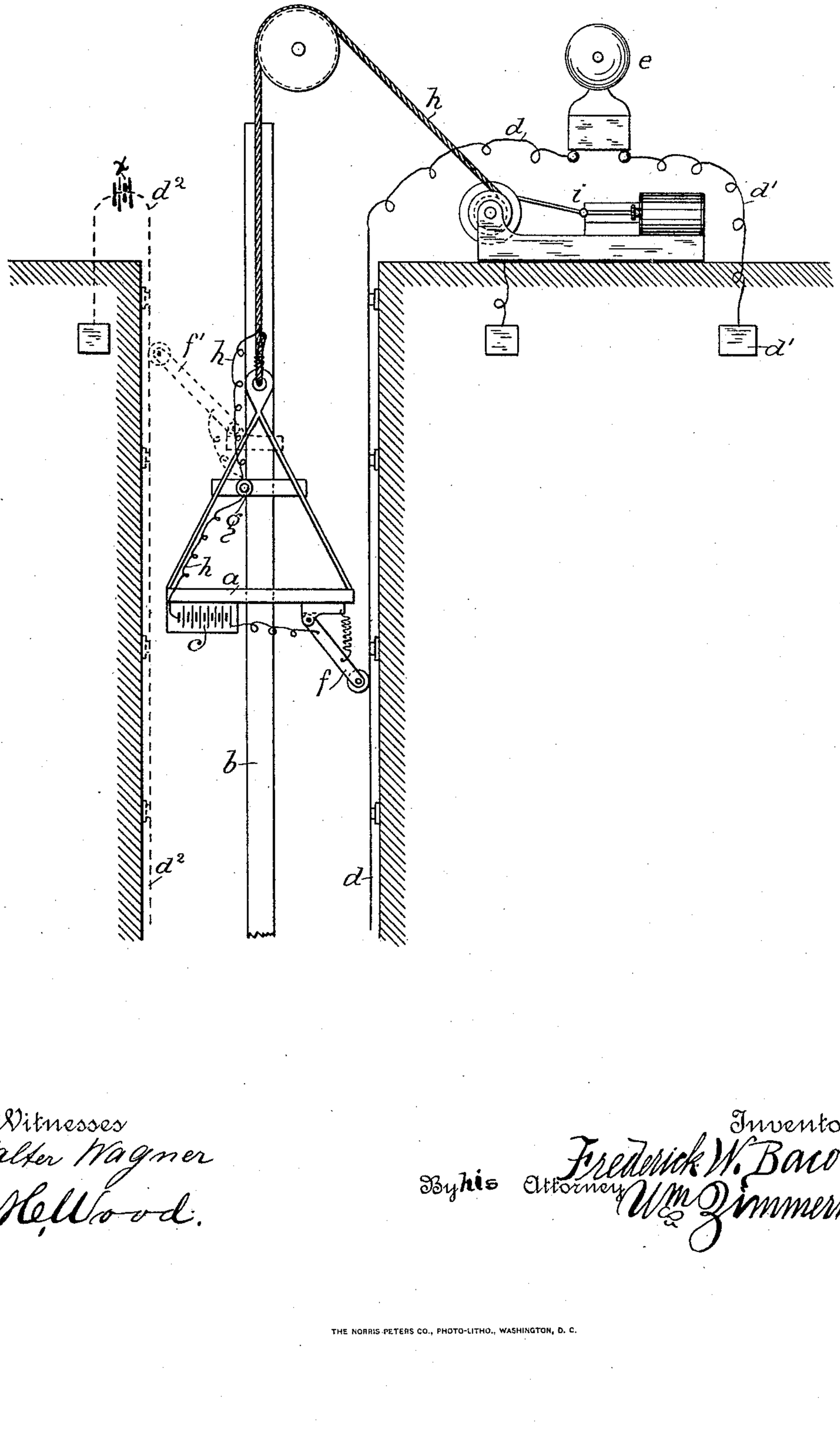
(No Model.)

F. W. BACORN.

ELECTRIC SIGNAL FOR MINE SHAFTS.

No. 467,985. Patented Feb. 2, 1892.



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UNITED STATES PATENT OFFICE.

FREDERICK W. BACORN, OF MARYSVILLE, MONTANA.

ELECTRIC SIGNAL FOR MINE-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 467,985, dated February 2, 1892.

Application filed July 28, 1891. Serial No. 400,966. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. BACORN, a citizen of the United States, residing at Marysville, in the county of Lewis and Clarke and State of Montana, have invented certain new and useful Improvements in Electric Signals for Mine-Shafts, which are fully set forth in the following specification, reference being had to the accompanying drawing, forming a part hereof, and in which the drawing shows a section of a mine-shaft with an elevator cage in it provided with my improved electric signaling device.

The object of my invention is to provide an electric signaling device for cages of mine-shafts, elevators, and other like vehicles to which it may be applicable, whereby signals may at any and all times be made from the cage to the engineer or other parties outside of such vehicle. As at present constructed there is a rope from the bell in the engineer's room which runs down to the bottom of the shaft, generally outside of the cage, which must be caught by the hands and pulled to ring said bell—a device which is very unreliable, and its operation is always more or less difficult when the cage is in slight motion, depending both on its direction and speed, and is impracticable when the cage is running at its usual or required speed. To overcome said difficulties, I have contrived an electrical apparatus which is constructed substantially as follows, namely:

The cage *a* is held by the usual guides or ways *b* and raised by a rope *h*, passing over a sheave to a drum, wound and unwound by an engine *i*, all of which said parts may be of any known construction. Into the shaft of the mine is passed a wire *d*, insulated from the shaft-timbers and open at its lower end, as shown, and of which the upper end is connected to an electric bell *e* or other signaling device, which is connected through a wire *d'* to earth. On the cage, or, as here shown, under its floor, is carried a battery *c*, of which one pole is connected to a trolley *f*, which connects that side of the battery with said wire *d*. To the opposite pole of the battery is connected a wire *h*, which runs up through the cage, and its upper end is connected to the wire hoisting-rope *h*, which, through the operating machinery *i*, connects to earth, thus completing the electric circuit of the battery, as shown. In said wire *h* and in a suitable place in the cage is placed a push-button *g* to make and break said circuit. When for any reason the electric circuit cannot be made through the hoisting-rope of the cage or for other reasons it may be desired a second open wire d^2, like the wire *d*, may be put into the shaft and connected to earth at its upper end, as shown. Said wire is then put into the circuit through the wire *h* above the push-button *g*, which is connected to a trolley *f'*. Said wire d^2 and trolley f^2 and a short piece of the connecting-wire *h* are shown in broken lines, so as to distinguish them clearly from the other parts before mentioned.

It is not necessary that the battery *c* be placed on the cage or vehicle, because it may really be placed at any convenient point in the circuit, as in the wires *d* or *d'* or in the wire d^2, as at *x*, it only being necessary in such case to observe that the battery must be placed above the uppermost point reached by the cage at its upper position. When, therefore, the circuit is closed, the return current will be established through the earth and the signaling device will be operated while the cage is in motion.

What I claim is—

The combination, with a mine-shaft provided with an electric conductor extending through its length, electrically open at its lower end and connected at its upper end to signaling mechanism, of a cage provided with a hoisting-rope capable of conducting an electric current, connected at its upper end to said signaling mechanism, a trolley from said cage on said electric conductor, a push-button within said cage, and connections to said trolley and hoisting-rope, substantially as specified.

FREDERICK W. BACORN.

Witnesses:
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