

(No Model.)

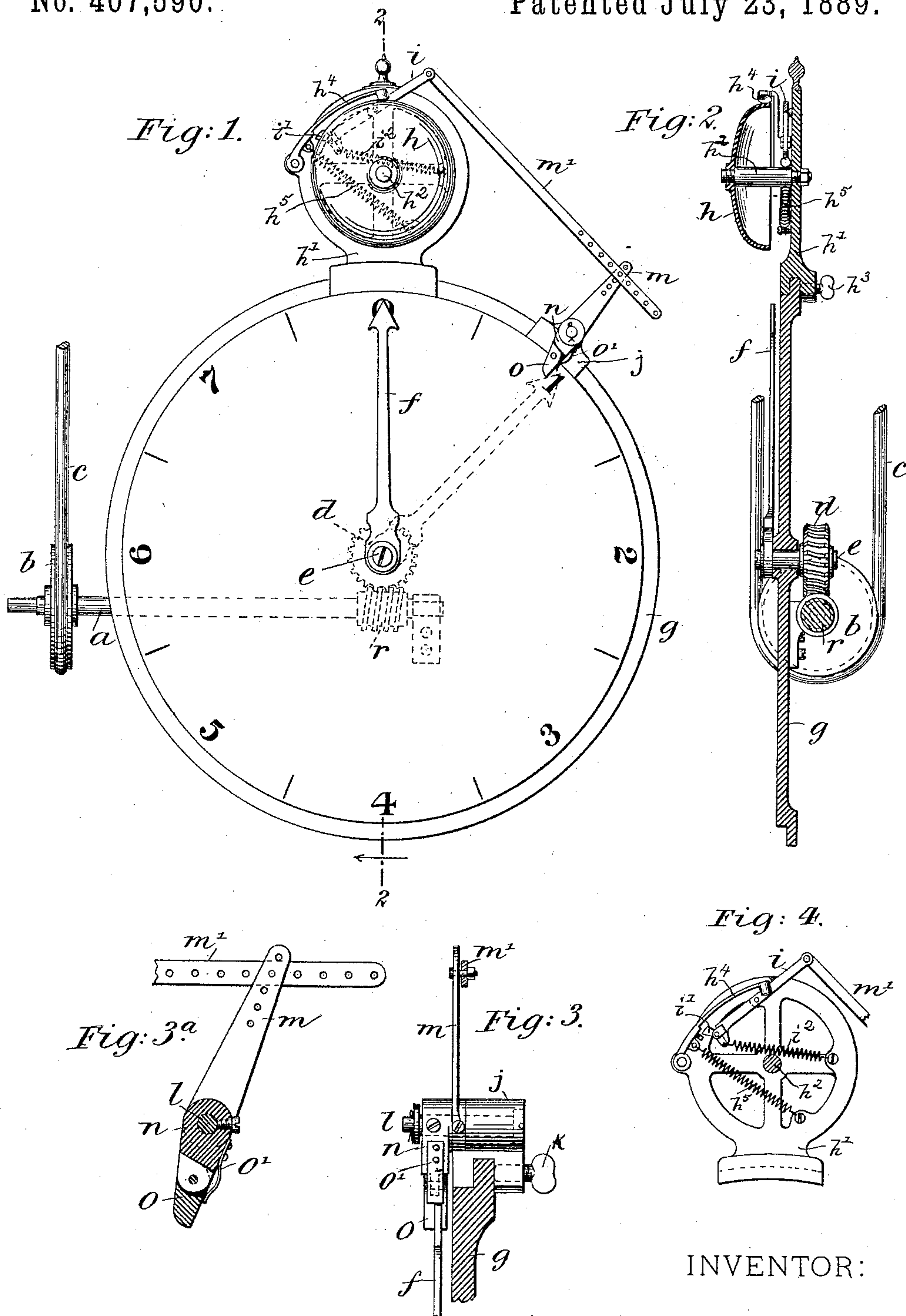
2 Sheets—Sheet 1.

W. E. HALL.

INDICATOR AND SIGNAL FOR ELEVATORS.

No. 407,590.

Patented July 23, 1889.



WITNESSES:

*John A. Rensie*  
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(No Model.)

2 Sheets—Sheet 2.

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Fig: 5.

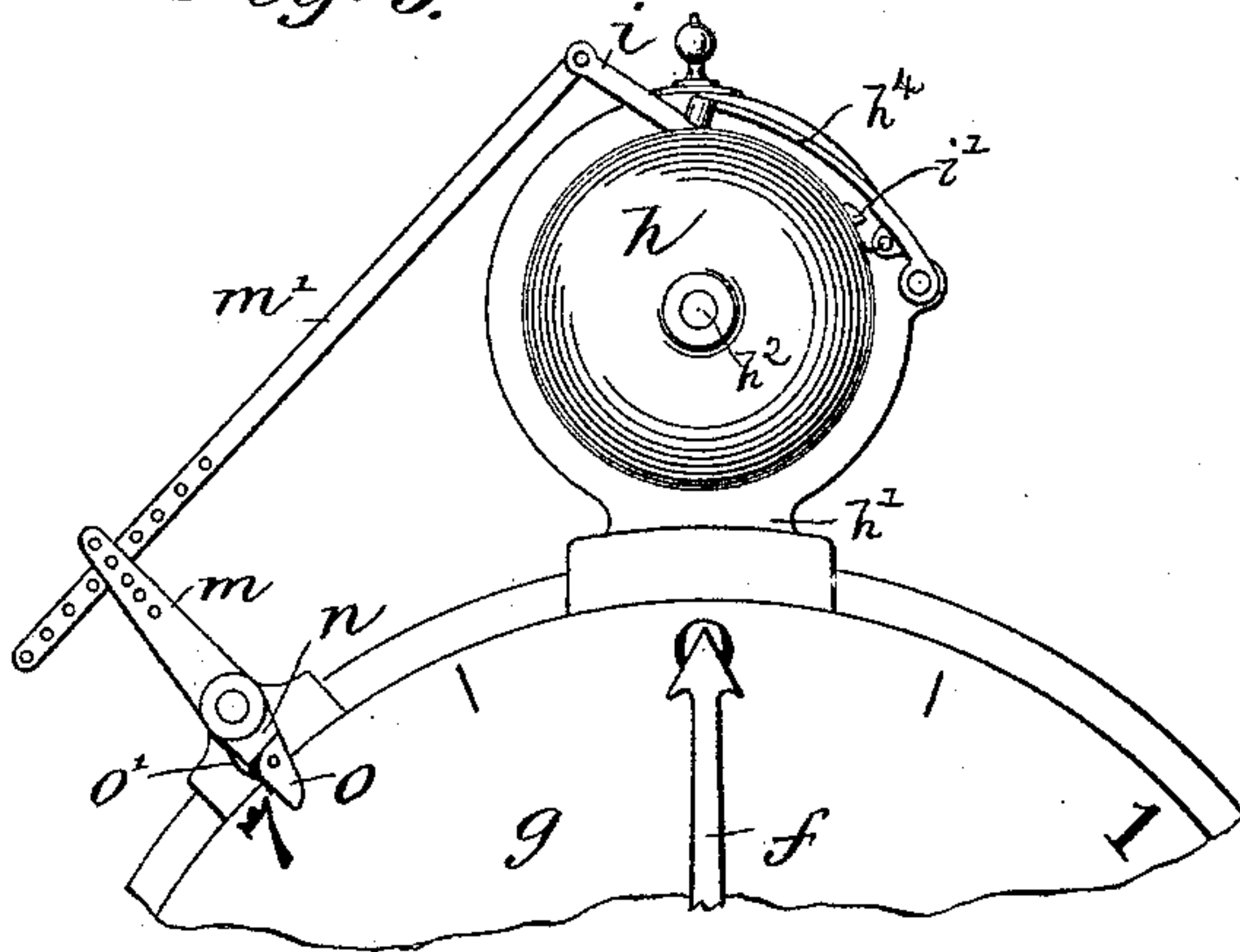
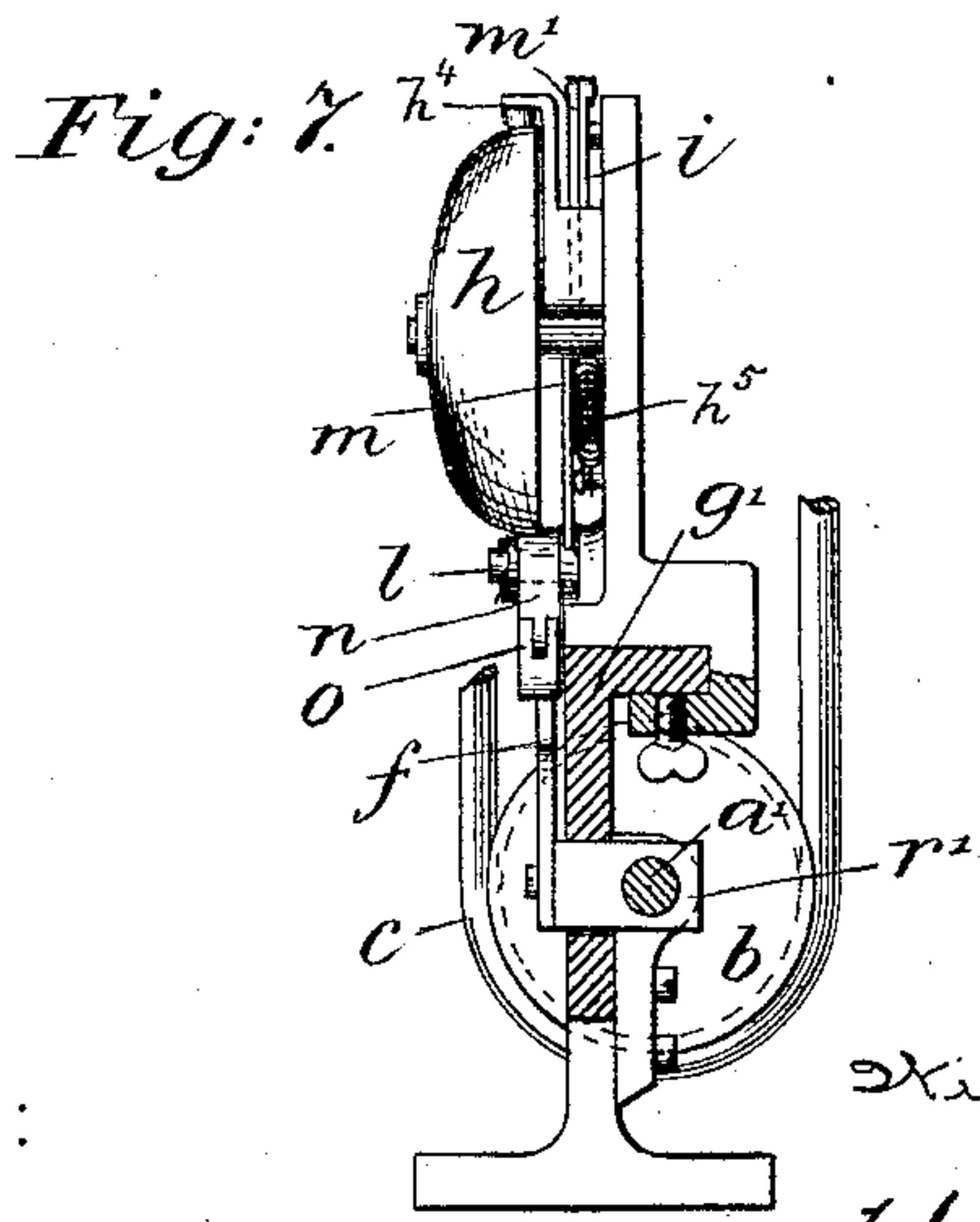
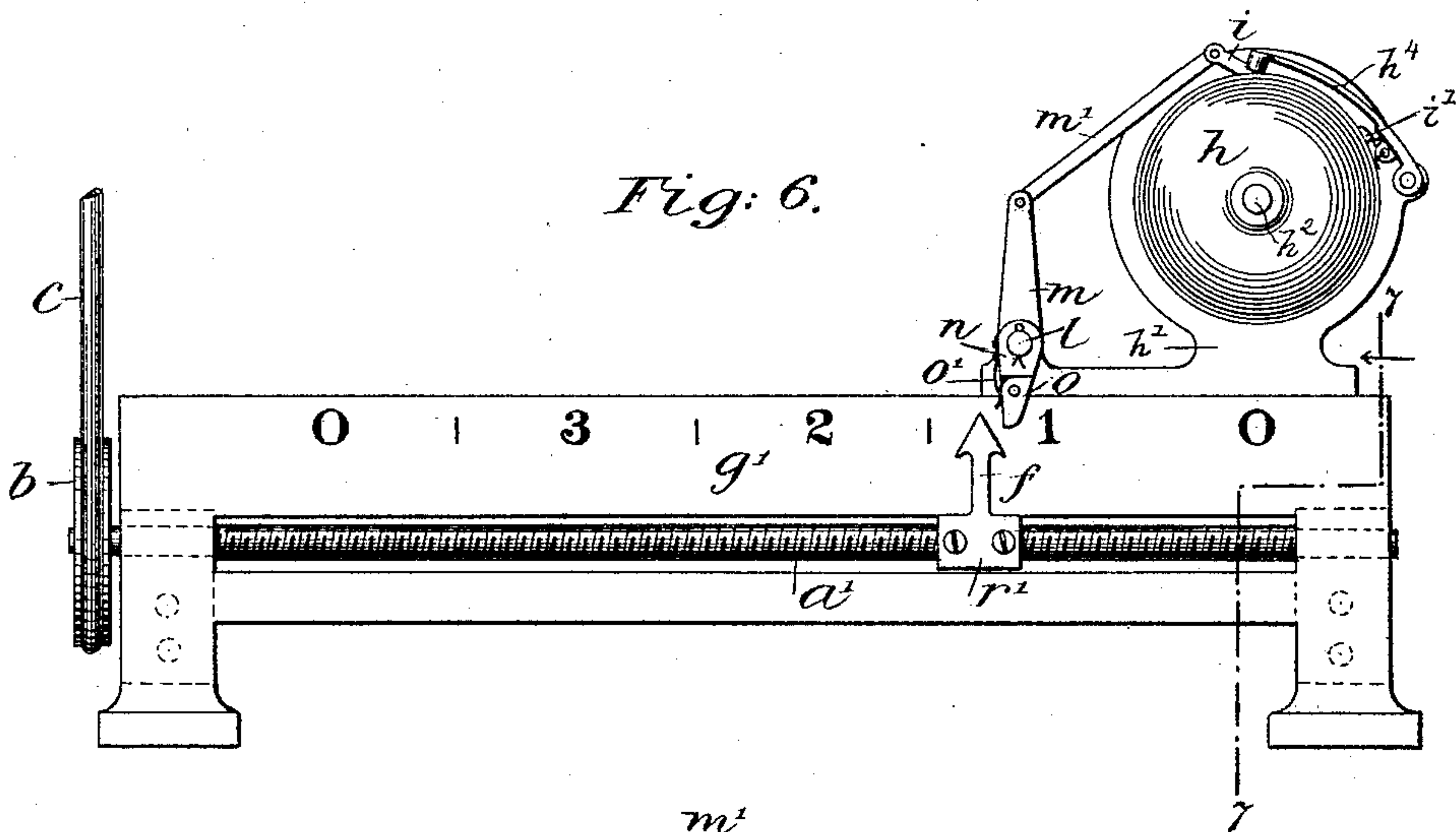


Fig: 6.



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# UNITED STATES PATENT OFFICE.

WILLIAM E. HALL, OF BUTTE CITY, MONTANA TERRITORY.

## INDICATOR AND SIGNAL FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 407,590, dated July 23, 1889.

Application filed April 4, 1889. Serial No. 305,924. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. HALL, a citizen of the United States, and a resident of Butte City, in the county of Silver Bow, Montana Territory, have invented certain Improvements in Indicators and Signals for Elevators, of which the following is a specification.

My invention relates to a combined visual indicator and audible signal for use in connection with mine-elevators, whereby the engineer in attendance upon the hoisting-engine may know by observation at what level the cage is at any time while it is ascending or descending, and whereby he may receive an audible signal when the cage shall have reached some predetermined point in its ascent or descent.

My invention will be fully described hereinafter, and its novel features carefully defined in the claims.

In the accompanying drawings, illustrative of my invention, Figure 1 is a front elevation of the combined indicator and signal, and Fig. 2 a sectional view of the same on line 2-2 in Fig. 1. Figs. 3 and 3<sup>a</sup> are enlarged views of the trip device detached. Fig. 4 is a view of the gong-actuating mechanism. Fig. 5 is a view similar to Fig. 1, illustrating the arrangement of the trip device when the cage is descending. Figs. 6 and 7 illustrate a slightly-modified form of the apparatus.

*a* is the operating-shaft of the device, which will be driven from the hoisting-shaft of the cage through the medium of a pulley *b* and belt *c*, or other similar mechanism. I have not shown the cage and its hoisting mechanism, as the driving of an indicator from the hoisting-shaft of an elevator has been practiced before. On the shaft *a* is secured a worm *r*, which gears with a worm-wheel *d* fixed on an arbor *e*. On the arbor *e* is fixed a pointer or index *f*, which traverses the face of a dial *g*, on which are numbered gradations 1 2 3 4, &c., corresponding each to one of the levels of the mine. In the present case I have supposed there are seven levels, the zero-mark indicating both the bottom and the mouth of the shaft. The gearing will be so proportioned that when the cage is ascending or descending and arrives at any level, as 5, the index *f* will stand at the corresponding

numeral, as 5, on the dial. As the device is represented in Fig. 1, the index will move to the right from the zero-mark when the cage descends, and to the left from the zero-mark when the cage ascends. Simple indicators similar to this have before been employed.

I will now describe the device actuated by the index of the indicator for sounding the gong or giving otherwise an audible signal to the engineer when the cage has reached some predetermined point in its travel, either up or down.

*h* is the gong, mounted removably on the plate of the dial *g*, and provided with an operating-lever *i*. The striking mechanism of the gong may be of any kind preferred. That illustrated in Figs. 1, 2, and 4 is well known. It comprises the supporting base or bracket *h'*, having a post *h*<sup>2</sup>, on which the gong is mounted. The bracket is secured to the dial by a set-screw *h*<sup>3</sup>. The lever *i* is pivotally mounted on this bracket, and its operative end, which carries a trip *i'*, is provided with a retracting-spring *i*<sup>2</sup>. When the lever *i* is pulled over, the trip acts upon the hammer *h*<sup>4</sup> of the gong and raises said hammer, and when the trip has passed the spring *h*<sup>5</sup> of the hammer causes the latter to strike the gong a smart blow. Any gong device of this general character may be used.

Mounted adjustably on the dial *g* is a trip device, which is coupled to the lever *i*, and stands in the path of the pointer *f*, whereby, when said pointer reaches a certain point in its travel, it will act on said trip device and sound the gong, imparting an audible signal to the engineer. This trip device consists of a bracket *j*, constructed to be mounted adjustably on the plate of the dial *g* and to be held at any point at which it is set by a set-screw *k*. In this bracket is mounted a rock-shaft *l*, on which is secured an arm *m*, which is coupled by a link *m'* with the lever *i*. On said shaft is secured a short arm *n*, to which is pivotally secured a toe *o*, which stands just in front of the dial and in the path of the pointer *f*, as seen in Fig. 1. This toe is so mounted on the arm *n* that it is free to yield and swing out of the way when the pointer engages it in moving to the right, (as when the cage is descending,) the spring *o* yielding to the pressure; but when the cage



is ascending and the pointer *f* engages the toe from the opposite side, as indicated in dotted lines in Fig. 1, the heel of the toe engages a shoulder on the arm *n*, and cannot swing independently of the latter; consequently the pointer in acting from this direction on the toe will rock the shaft *l*, and, through the arm *m*, link *m'*, and lever *i*, sound the gong.

The trip device may be set at any point on the rim of the dial, and the perforations in the link *m'* and arm *m* will allow of considerable movement thereon without moving the gong; but the gong may also be shifted at will, it being secured removably and adjustably to the dial in a manner similar to that described with reference to the trip device.

Ordinarily the trip device will be set so as to impart an audible signal to the engineer when the cage is ascending and has almost reached the mouth of the shaft; but it may be set to give the signal at any point desired. Indeed, my invention contemplates the use of more than one trip device and gong like those shown, all of which may be set on the dial-plate at the same time, but at different points.

Usually the signal will be required during the ascent of the cage; but the same device, except with the parts inverted, may be used to impart a signal when the cage is descending. This is illustrated in Fig. 5.

The brackets or supports of the trip device and gong may be connected together or integral, so that both will be shifted or set at the same time, in which case the connection between the arm *m* and link *m'* need not be variable or adjustable.

In Figs. 6 and 7, the former of which is a front view and the latter a transverse section on line 7 7 in Fig. 6, I have shown a construction substantially the same as that before described, except that the pointer *f* moves in a right line to and fro and a plate *g'* takes the place of the dial *g* and is the equivalent thereof. I will briefly describe this variation. The gong *h* and the trip device are mounted

adjustably on the upper edge of the plate *g'*, and the pointer is attached to and carried by a traveling nut *r'*, which runs on a screw-shaft *a'*, rotatively mounted in bearings on the plate *g'*. This construction is susceptible to all of the changes noted with regard to the other construction shown.

In Fig. 3 I have shown the arm *m* attached to the same boss with the arm *n*, but this is unimportant.

Having thus described my invention, I claim—

1. The combination, with the dial-plate, the pointer which travels over the same, and its operative mechanism, of the gong and the trip device, substantially as described, mounted adjustably on said dial-plate and coupled to the operating mechanism of the gong, the toe of said trip device being arranged in the path of said pointer, as set forth.

2. The combination, with the dial-plate, the pointer which travels over the same, and its operative mechanism, of the gong mounted adjustably and movably on said plate, and the trip device described, also mounted adjustably on said plate and connected adjustably to the operating mechanism of the gong, as set forth.

3. The combination, with the dial-plate, the pointer and its operative mechanism, of the gong mounted on the dial-plate and the trip device mounted on and clamped to the dial-plate, said device consisting of the supporting-bracket, the rock-shaft in said bracket, the arm *m* on said shaft coupled to the operating mechanism of the gong, the arm *n* on said shaft, the toe *o*, pivotally mounted in the arm *n*, and the spring *o'*, said toe being arranged in the path of the pointer, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM E. HALL.

Witnesses:

JOHN F. CORKER,  
BENJAMIN W. JEMSENS.