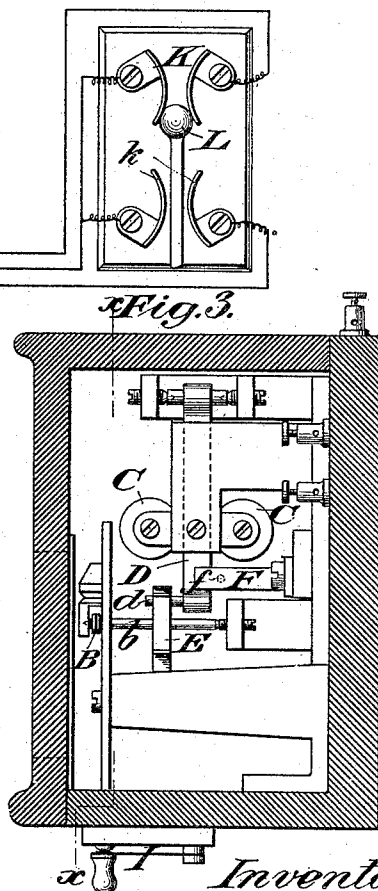
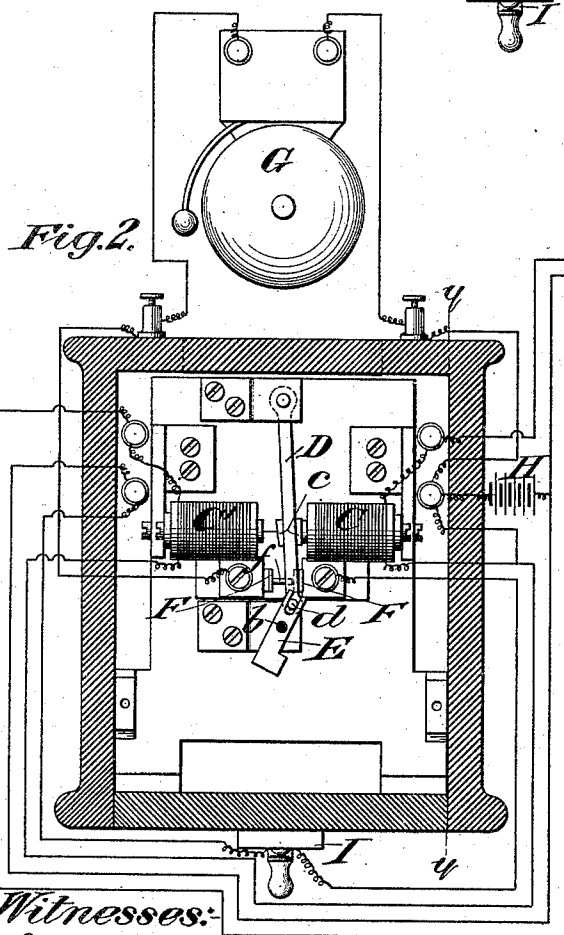
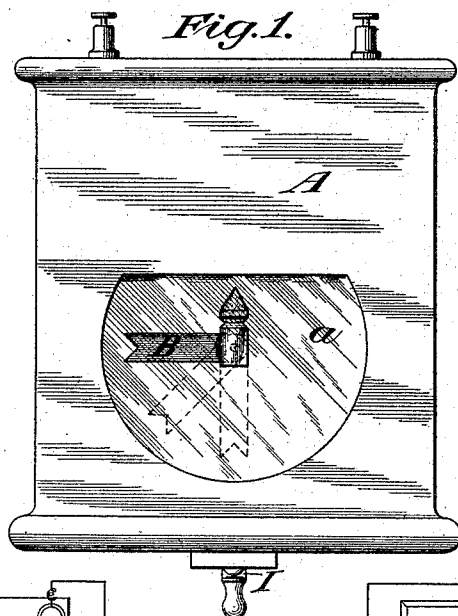


(No Model.)

T. H. PATENALL.  
SIGNAL REPEATER.

No. 488,285.

Patented Dec. 20, 1892.



Witnesses:

*D. H. Raymond*  
*C. Sundgren*

*Inventor:-*  
*Thomas H. Patenall*  
*by attorneys*  
*Brown & Howard*

# UNITED STATES PATENT OFFICE.

THOMAS H. PATENALL, OF RAHWAY, NEW JERSEY.

## SIGNAL-REPEATER.

SPECIFICATION forming part of Letters Patent No. 488,285, dated December 20, 1892.

Application filed January 2, 1892. Serial No. 416,776. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS H. PATENALL, of Rahway, in the county of Union and State of New Jersey, have invented a new and useful Improvement in Signal-Repeaters, of which the following is a specification.

My invention relates to an improvement in signal repeating devices for use in connection with signal operating mechanism to indicate to the operator the position of the signal.

My invention contemplates more particularly the introduction of an audible signal in connection with the visual repeating signal now in use to warn the operator in case the signal fails to complete its stroke from danger to safety or the reverse.

A practical embodiment of my invention is represented in the accompanying drawings in which,

Figure 1 is a front view of the casing which incloses the repeating devices, the visual repeater being shown through a glass window or opening. Fig. 2 is a vertical section taken through the casing in the plane of the line  $\alpha \alpha$  Fig. 3 and showing the electric connections with the audible signal and with the contact pieces which receive the circuit closer controlled by the signal operating mechanism and, Fig. 3 is a view in vertical section from front to rear through line  $\gamma \gamma$  of Fig. 2.

A represents a suitable casing in which the electro magnet and repeater operating mechanism are located. The casing is here shown rectangular in form and is provided with a window  $a$  in its front through which the repeating signal arm B may be seen by the operator.

Within the casing two electro magnets C and C' are supported having a space between their adjacent ends for the vibratory movement of a common armature  $c$ . The armature  $c$  is fixed to or formed integral with a swinging arm D here shown as depending from its pivotal support at the upper portion of the casing and provided at its free end with a pin  $d$  having a loose engagement with the end of a counterbalance arm E fixed to rotate with the spindle  $b$ . The spindle  $b$  is mounted so as to rotate freely and carries on its front end the signal arm B. The depending arm D vibrates between a pair of yielding contact pieces F one of which is provided

with a stud or projection  $f$ , which, when the arms F assume their normal positions under tension tending to close them, makes an electrical contact with the opposite contact piece. The contact pieces F may be made, one or both, of spring metal or a spring of ordinary form may be utilized to throw the pieces normally toward each other. The positions of the magnets relatively to the contact pieces F are such that when the arm D is swung to bring the armature  $c$  into engagement with either magnet it will press the contact pieces F apart sufficiently to disengage the stud  $f$  from the opposite piece, and hence break the electric circuit through the pieces F. The swing of the arm D is intended to be sufficient to move the repeater arm B from horizontal to down and vice versa. An electric bell G is in circuit with the contact pieces F, a battery H and a switch I. The magnet C is in circuit with the battery H and a pair of contact pieces K with which the circuit closer L under the control of the signal operating mechanism is adapted to contact when the signal is set horizontal or at danger and the magnet C' is in circuit with the battery H and a pair of contact pieces  $k$  with which the said circuit closer L is adapted to contact when the signal is down or at safety.

The operation is as follows: When the circuit closer L is raised into contact with the pieces K in the act of setting the signal to danger, it will close circuit through magnet C, energize the said magnet and draw the arm D into the position shown in Fig. 2, and the repeater arm B will assume the horizontal position shown in Fig. 1. When the signal is operated in the opposite direction the circuit closer L will engage the pieces  $k$  breaking circuit through magnet C and closing circuit through the magnet C', thereby drawing the arm D over into contact with magnet C' and turning the signal arm B into a depending position. The movement of the arm D between the magnets will be announced by an alarm from the bell, caused by the momentary closing of the circuit through the contact pieces F, and, if the signal fail of being completely thrown, the arm D will hang between the two magnets, and the circuit through the bell will continue complete and the bell continue to ring. In case of any fail-

ure of the signal to operate for any great length of time the sound of the bell may be caused to cease by simply turning the switch I.

What I claim is:

5 The signal repeating device comprising the separated magnets each in independent circuit, the swinging armature common to the two magnets, the visible signal supported to swing, an arm connected with the swinging  
10 visible signal and having a loose engagement with the free end of the swinging armature, the yielding contact pieces having a normal tendency to rest in electrical contact, and the audible signal in circuit with the yielding

contact pieces, the swinging armature being 15 located between the yielding contact pieces and when in its middle position free from pressure from either of the yielding contact pieces and adapted to engage one of the contact pieces just before it reaches the limit of 20 its movement toward the magnet to which it is attached and thereby break the audible signal circuit, substantially as set forth.

THOMAS H. PATENALL.

Witnesses:

FREDK. HAYNES,  
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