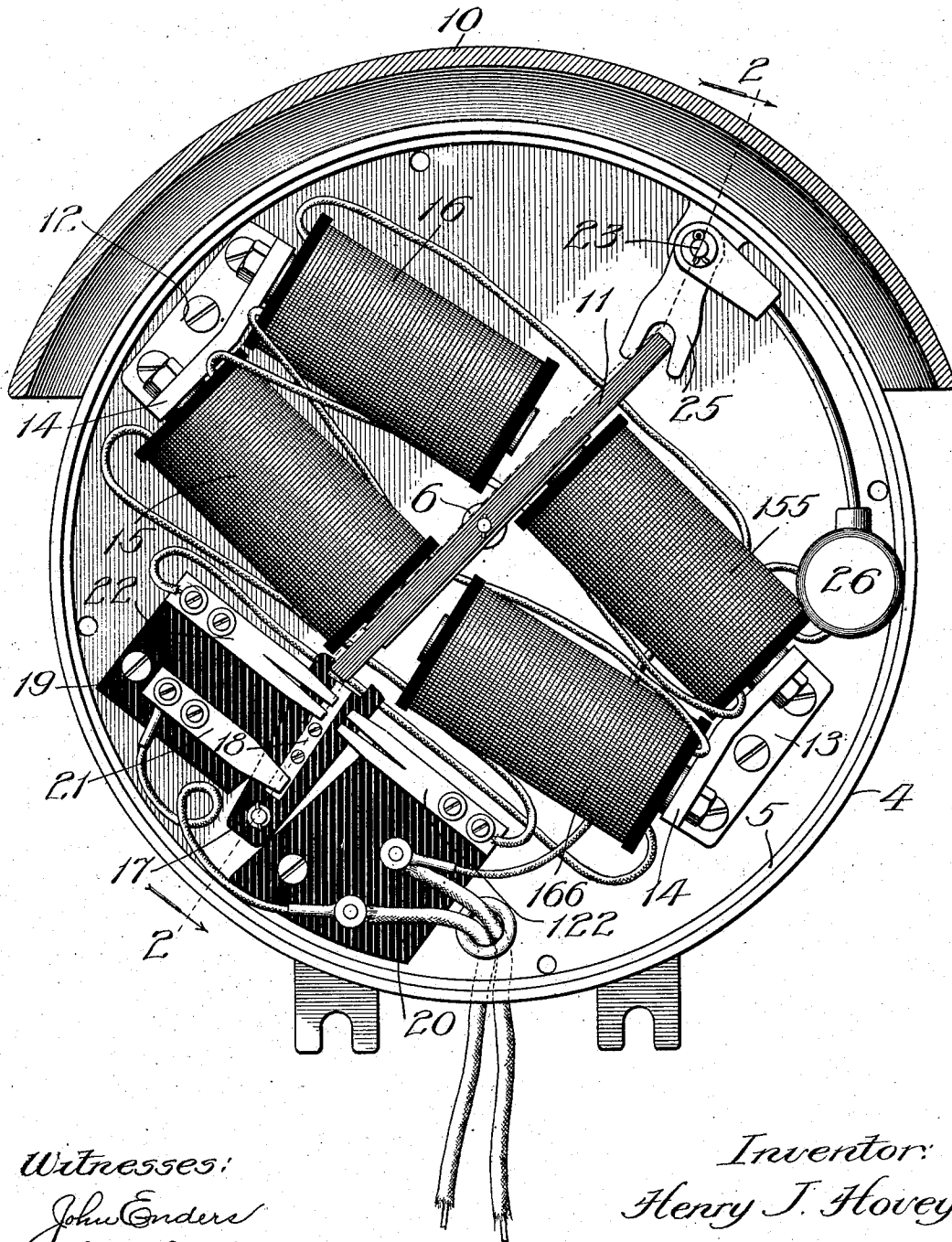


H. J. HOVEY.
ELECTRIC ALARM SIGNAL.
APPLICATION FILED JULY 18, 1908.

933,369.

Patented Sept. 7, 1909.
2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

John Enders
Chas. H. Buell

Inventor:

Henry J. Hovey

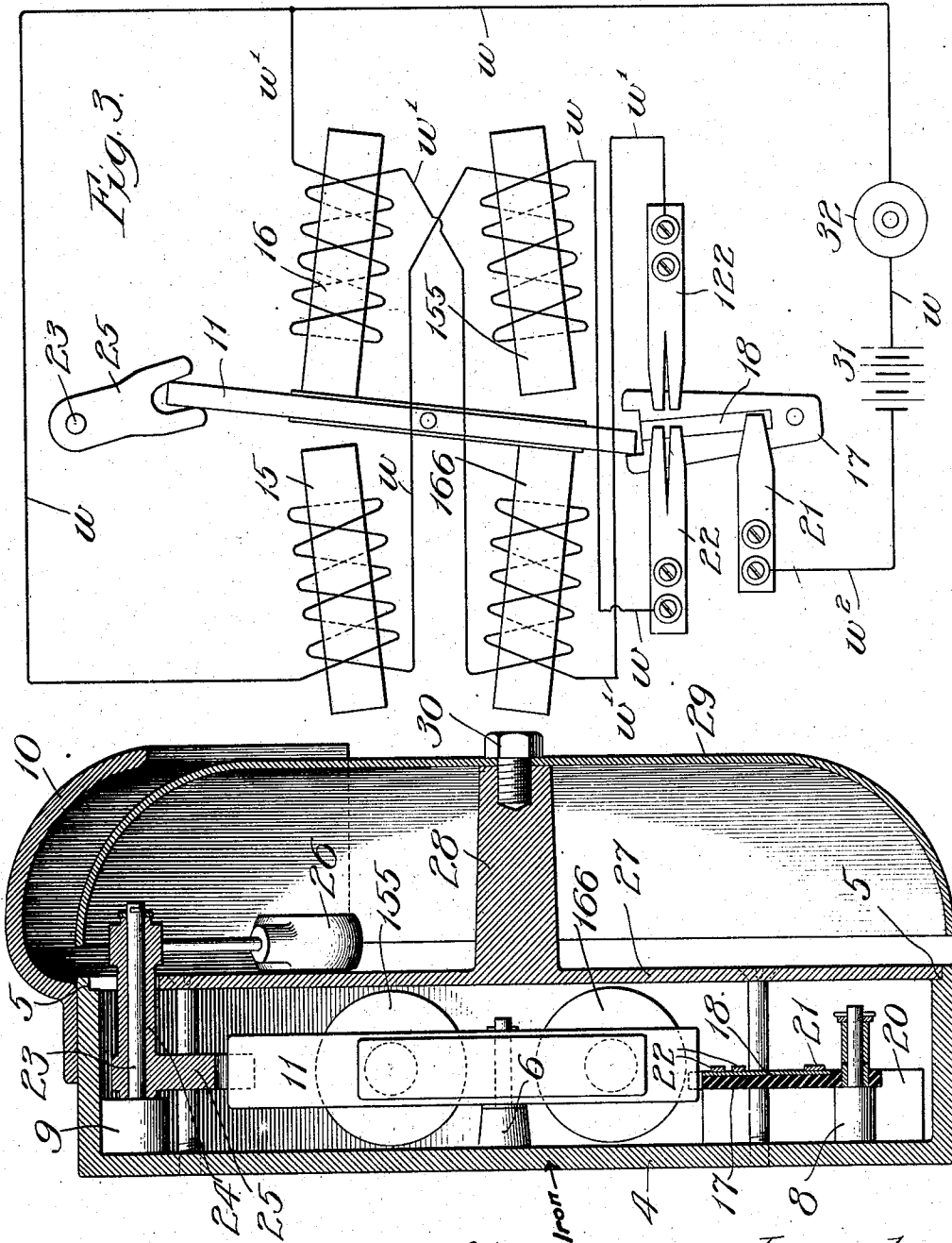
By *degenforth, Pe, Britton & Wilcox*
Attys.

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John Enders
Chas. H. Buell

Fig. 2.

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UNITED STATES PATENT OFFICE.

HENRY J. HOVEY, OF EVANSTON, ILLINOIS, ASSIGNOR TO BRYANT ZINC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ELECTRIC ALARM-SIGNAL.

933,369.

Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed July 18, 1908. Serial No. 444,176.

To all whom it may concern:

Be it known that I, HENRY J. HOVEY, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Electric Alarm-Signals, of which the following is a specification.

My invention relates to an improvement in the class of electrically-sounded gongs, such as are used as alarm-signals at railway-crossings to announce the approach of a train, which, in approaching the crossing, closes the electric circuit containing the device to actuate it. Similar alarm-signals are also used at swing-bridges and in other connections for warning against danger.

In the accompanying drawings, Figure 1 is a face view, with a shield-detail in section, of my improved device with its gong-carrying cover removed to disclose the oscillatory hammer and its electro-magnetic actuating mechanism; Fig. 2 is a section on the irregular line 2-2 Fig. 1, and Fig. 3 is a diagram of the electric circuits containing the signal-operating electromagnets.

The casing 4 is an iron casting of circular form with an annular cover-seating shoulder 5 about its edge and a central boss 6 and bosses 8 and 9 in diametrical line with each other on its base. A shield 10 of the preferred bulging shape illustrated extends partway about the casing to overhang what constitutes the arc described by its upper portion in the position of its use, to exclude snow, dirt and the like from the interior of the gong, hereinafter described.

On the central boss 6 an armature 11 is pivotally supported centrally between its ends to adapt it to oscillate freely, and at opposite points on the base of the casing are provided iron brackets 12 and 13, each securely fastened through its base-portion to the casing-base and having its flange-portion 14 bent, as shown, to describe an obtuse angle with the faces inclining correspondingly from the apex to afford fastening-points each for the core of an electromagnet spool. Thus the spools 15 and 16 are rigidly fastened to the flange-faces of the bracket 12 and the spools 155 and 166 are similarly fastened to the flange-faces of the bracket 13, the positions of the two brackets being such as to bring the apexes of their bent flanges in diametrical line with the pivotal point of the

armature; and the relative inclination of the magnet-spools brings the adjacent poles of those forming the pair 15 and 155 fully against opposite sides of the armature in one ultra-position of its throw and the adjacent poles of those forming the pair 16 and 166 similarly against the respectively adjacent sides of the armature in the other ultra-position of its throw. A switch-lever 17, of insulating material, is fulcrumed at one end on the boss 8 and is bifurcated or recessed in its opposite free end where it receives the adjacent end of the armature; and it carries on its outer face a metal contact-strip 18. Blocks 19 and 20 of insulating material are secured on the casing-base at opposite sides of the switch-lever 17, the block 19 carrying a metal contact finger 21 with its free end bearing against the strip 18 near the fulcrum of the lever to be permanently in contact with that strip, and a contact-finger 22 with its free end extending into position to contact with the strip 18 near the free end of the lever, thereby to separate the contact by one throw of the lever, and by its opposite throw contact the strip with a circuit-closing finger 122 secured on the block 20 in position to form a companion to the finger 22. The boss 9 has a post 23 extending from it and surrounded by a sleeve 24, from the inner end of which an arm 25 projects at a right-angle to receive in its bifurcated or recessed end the adjacent end of the armature; and the stem of a hammer 26, forming the gong-striker, projects similarly from the sleeve near its opposite end.

A cover-forming disk 27 seats removably and is fastened against the annular shoulder 5 to shield the electromagnet-mechanism; and a post 28 extends from its center and carries the gong 29, which is fastened through a central hole in it, by a screw-bolt 30 to the end of the post, whereby an arc-section of the gong extends under the shield 10 for the purpose hereinbefore mentioned.

The circuits containing the electromagnets may be traced on the diagram of Fig. 3 as follows: An electric generator is represented conventionally at 31 with a circuit-closer conventionally shown as a push-button 32, included in a wire *w* leading from one pole of the generator, passing through the magnets 13 and 155 to connect them in series and terminating at the finger 22; a branch

w^1 leads from the wire w through the magnets 16 and 166, connecting them in series and terminating at the finger 122; and a wire w^2 connects the finger 21 with the opposite pole of the generator.

From the foregoing description of the mechanism the operation will be understood to be the following: Upon closure of the circuit, as by manipulating the push-button and with the parts in the relative positions represented in the diagram, the magnets 15 and 155 will be energized to attract to their poles the armature, thereby causing the latter to turn the switch-lever 17 in the direction to break the circuit at 18, 22 and close it at 18, 122 thus energizing the magnets 16 and 166 to retract the armature to their poles. In this way, while the circuit remains closed, the armature will be continuously oscillated to alternate energizing of the magnet-pairs; and the oscillations of the armature, by its engagement with the arm 25, actuate the hammer against the gong and sound it with rapidly-repeated strokes. Obviously, the rebound of the hammer imparts to the arm 25 momentum which causes it to act against the armature and supplement the attractive force upon it of the electromagnets with the advantage of economizing in the current for energizing them.

It will be observed that each time a pair of the electromagnets, the members of which are disposed in diagonal relation to each other, is energized by closure of the electric circuit containing the same, a magnetic circuit is formed through the core of one of the members, the bracket carrying it, the casing, the bracket carrying the other member, the core of that member, and the armature. This renders each pair of the members practically a horseshoe-magnet, whereby the pulling-force of both poles is exerted close to the armature. The advantage which ensues is that the operation of the device may be effected with the minimum expenditure of current, or with four volts of a battery where eight volts would be required if the magnets were insulated magnetically from each other, or if the members of each pair were arranged side by side, when the arc of movement between the core of the outermost member and the outer-end portion of the armature would be materially greater and render the force of attraction much weaker than the arc of movement between the core of the innermost magnet and the armature.

As will be understood, where the device is used for alarm-purposes on a railroad the usual or any suitable provision is made for

effecting the circuit-closure automatically by locomotives or trains running on the track.

What I claim as new and desire to secure by Letters Patent is—

1. In an electric alarm-signal the combination with a metal base, of a pair of metal brackets secured to the casing in metallic contact therewith, each of said brackets having a projecting flange bent to form an obtuse angle, said brackets being secured to the casing so as to face each other, two electro-magnets secured to each flange with their cores in metallic contact with the flange whereby the electro-magnets secured to each flange diverge from each other, an electric circuit containing in series members of said electro-magnets arranged diagonally to each other on the casing and forming pairs, an armature pivotally mounted between its ends to extend between the electro-magnet-poles, a gong, a hammer connected to one end of said armature, contact fingers forming terminals in said electric circuit and a switch-lever extending between said fingers, said switch-lever being engaged by the armature for changing the circuit through said magnets.

2. In an electric alarm-signal the combination with a metal base, of a pair of metal brackets secured to the casing in metallic contact therewith, each of said brackets having a projecting flange bent to form an obtuse angle, said brackets being secured to the casing so as to face each other, two electro-magnets secured to each flange with their cores in metallic contact with the flange, whereby the electro-magnets secured to each flange diverge from each other, an electric circuit containing in series members of said electro-magnets arranged diagonally to each other on the casing and forming pairs, an armature pivotally mounted between its ends to extend between the electro-magnet-poles, a gong, a hammer connected to one end of said armature, a switch-lever fulcrumed in the casing and engaging at its free end with one end of the armature, a contact-finger included in said electric circuit and permanently engaging said lever, contact-fingers forming terminals in said circuit disposed on said casing at opposite sides of the switch-lever near its free end whereby current will be caused to pass alternately through said pairs of electromagnets when the circuit is closed.

HENRY J. HOVEY.

In presence of—

RALPH A. SCHAEFER,
W. T. JONES.