

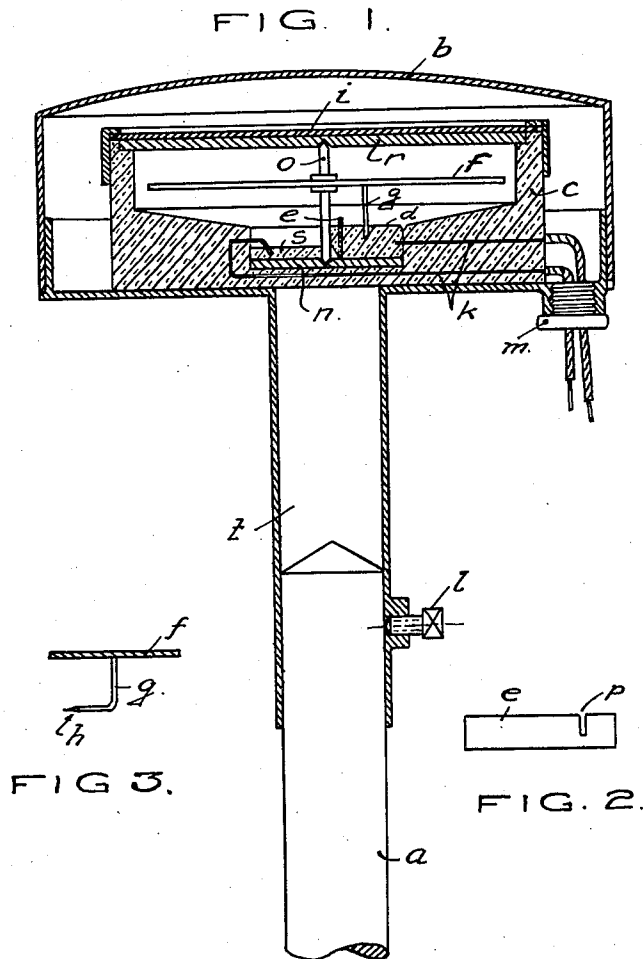
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SAFETY DEVICE FOR RAILROAD WORKING

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SAFETY DEVICE FOR RAILROAD WORKING

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2 Claims. (Cl. 246-249)

The invention relates to safety devices for railroad working, as described in the present specification and illustrated in the accompanying drawing that forms part of the same.

- 5 The invention consists essentially in the novel features in safety devices for railroad working using magnetic needles, as pointed out in the claims for novelty following a description in detail of a preferred form of the invention.
- 10 The objects of the invention are to insure greater safety and accuracy in safety devices for railroad working; to use the directive forces of the rails or bar-magnets connected to them upon the magnetic needle in preference to the earth magnetism which proves too small a directive
- 15 force in view of the large masses of iron, especially in multiple-track lines; to obtain a high coefficient of safety in making or breaking the contact influencing the operating circuits; to produce a safety device which will not be influenced by the undesirable vibrations produced by the passage of trains; and generally to provide safety devices for railroad working, cheap to manufacture, easy to install and efficient for the purposes
- 20 set forth.

In the drawing, Figure 1 is a vertical cross sectional view of the safety device.

Figure 2 is a side elevational view of the partition wall.

- 30 Figure 3 is a fragmentary detail of the magnet contact.

Like numerals of reference indicate corresponding parts in the various figures.

- 35 Referring to the drawing, the casing indicated by the letter *c* is made of any suitable insulating material and has a central cavity, the bottom of which is lined with a glass plate *n* having a central recess forming the lower bearing for the pivot *o* of the magnetic needle *f*.

- 40 The beam *r* diametrically bridging the casing *c* is recessed in the center to form a bearing for the upper end of the pivot *o*. The casing *c* has the glass cover *i* suitably held in place by a flanged ring.

- 45 The wall *e* divides the cavity of the casing into two sections *s* and *d*, both of which are filled with mercury up to a certain level.

- The wall *e* has the slot *p* just wide enough to allow for the passage of the elbow *g* preferably made of platinum wire, and rigidly secured to the needle *f* and terminating in a needle point *h*.

- 50 The level of the mercury in section *s* is such that the needle point clears it. In section *d* the level of the mercury is considerably higher than in section *s*.

The mercury contained in section *d*, owing to its high surface tension, cannot escape through the slot *p* which as aforesaid is just wide enough to allow for the passage of the elbow *g* terminating in the needle point *h* adapted to pierce the surface of the mercury exposed by the slot, thereby facilitating easy penetration and insuring good electrical contact.

The casing *c* sits on and is secured to a tray having a tubular extension *t*. The zinc or copper cap *b* forms with said tray a protective watertight cover for the casing *c*.

The tubular extension is slidably mounted on the cylindrical stand *a* to which it is adjustably secured by the set screw *l*.

The tray has a threaded opening closed by a bushing *m*, through which pass the electrical wires *k*, one leading to section *d* and the other leading to section *s*.

The electrical circuit is as follows:—From the mercury contained in section *s*, to the mercury contained in section *d* through the pivot *o*, magnetic needle *f* and elbow *g*; the circuit being completed by the wires *k*.

In the operation, the magnetic polarity and the direction of the lines of flux that the wheels and axles of the railroad vehicles assume when passing the particular point at which the device is to be located, being known, a magnetic field is established at that point in which the direction of the lines of force differs from the known field. This may be accomplished by placing bar magnets in suitable positions adjacent to the track. The device is then placed in the magnetic field of the bar magnets and the magnetized bar in the manner of a compass adjusts itself to the lines of force. The casing is then oriented to place the contact arm in contact with or out of contact with the mercury as desired. The bar and the condition of the electrical circuit effected by the contact remains stable until some outside magnetic influence of sufficient strength to affect the magnetic field is introduced. This outside influence is provided by the passage of the vehicle on the rails. The direction of the lines of force of the magnetic field of the vehicles and the bar magnets being made different, the passage of the vehicle will produce a deflection of the magnetic bar of the device which in moving will make or break the electrical circuit according to the setting.

It is easily understood that by reversing the bar magnets, the position of the magnetic needle could be changed and that consequently the closed circuit could be changed into an open

one adapted to be closed by the elbow *g* entering the section *d*.

The above is an important feature of the invention as it permits the turning of a closed circuit installation into an open one, and vice versa, according to the various requirements of the installation and this almost instantaneously. The tubular extension and cylindrical stand construction allows easy adjustment of the device through the set screw *l*, in that the device can be not only adjusted vertically but also laterally by simply revolving the tubular extension. This feature combined with the reversability of the bar-magnets allows a very fine adjustment of the device to meet with all sorts of conditions and requirements.

The elbow construction of the contact point increases the contacting surface without decreasing the penetrability of the needle point.

Another feature of the invention consists in the close proximity of the needle point to the pivot, since relatively small torsional forces are to be considered.

I claim:

1. In a safety device for railroad working, a mercury contact device comprising a compass-like magnetized bar pivoted to change direction in a horizontal plane, a contact arm secured to said bar and extending downward therefrom and terminating in a needle point horizontally extending normal to said bar, a mercury container having an aperture in the side disposed to permit the entry of said contact arm, mercury in the container to a level above said needle point, a second mercury container surrounding a pivot of said bar and mercury therein in contact with said pivot, said pivot being electrically connected

to said contact arm, electrical connections from each quantity of mercury, a casing housing and supporting said bar and containers.

2. In a safety device for railroad working, a mercury contact device comprising a shallow mercury container of non-conducting material divided by a non-conducting barrier into two compartments, said barrier having an aperture connecting the two compartments, a magnetized bar horizontally mounted on a vertical shaft having upper and lower bearings, said lower bearing being located on the bottom of one of said compartments, said upper bearing having supporting means attached to said container, contact arm secured to said needle and extending downwards therefrom and terminating in a needle point extending substantially normal to said shaft, the locations of the shaft and the contact and the said hole in the barrier permitting the passage of the contact point and arm between the two said compartments, a quantity of mercury in one compartment of sufficient depth to provide electrical contact with said shaft, a quantity of mercury in the other compartment sufficient to extend above said aperture in the barrier, a water tight casing and cover enclosing device, a translating device having electrical connections to the separate amounts of mercury, a post and socket support for said casing having securing means and adjustable vertically and rotatably, the device being placed in close proximity to the related track and oriented to make or break contact by the magnetic effect of a passing vehicle on the magnetized bar.

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