(No Model.) H. LEBASTEUR & S. H. ROUART.

APPARATUS FOR AUTOMATICALLY INDICATING OR SIGNALING THE PASSAGE OF TRAINS UPON RAILWAYS.

No. 332,913. Patented Dec. 22, 1885.

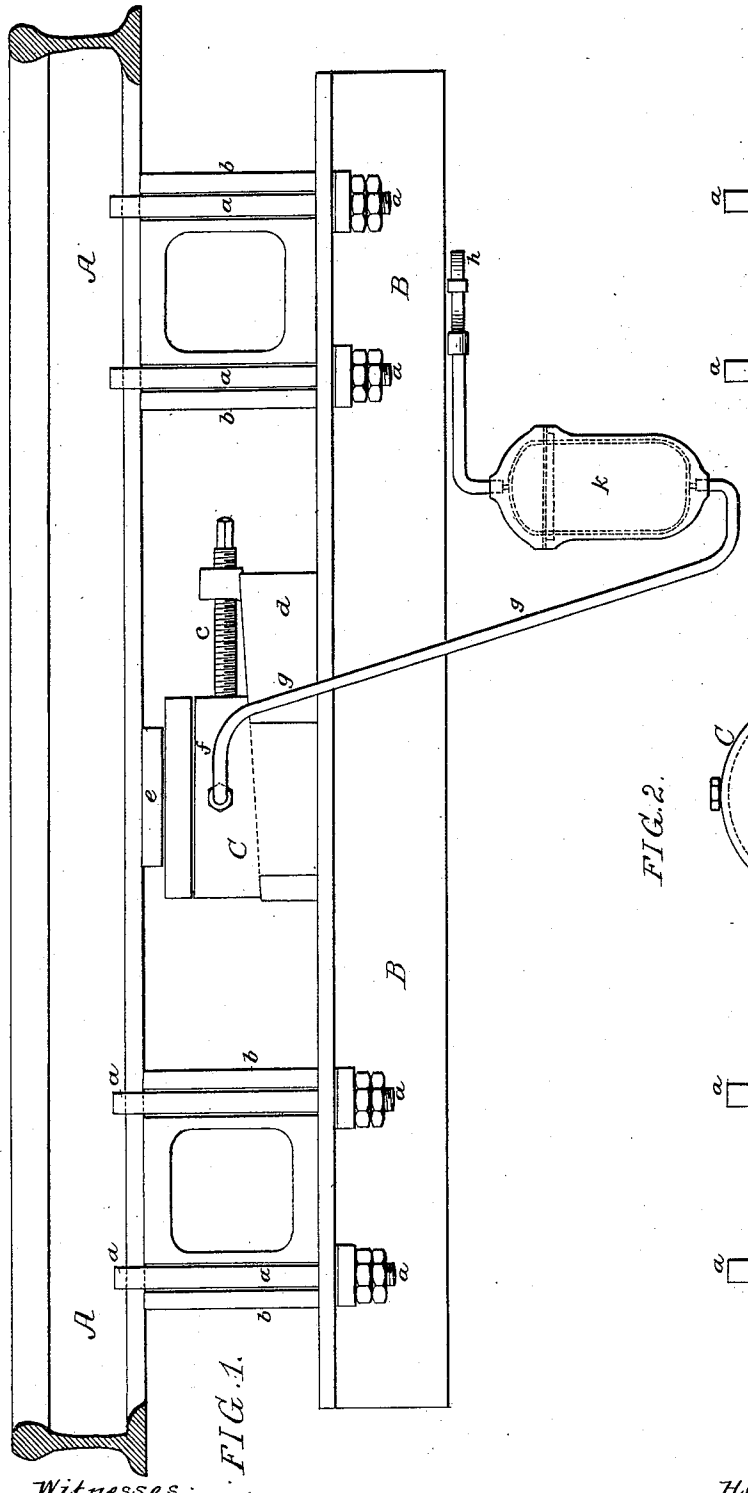


FIG. 1.

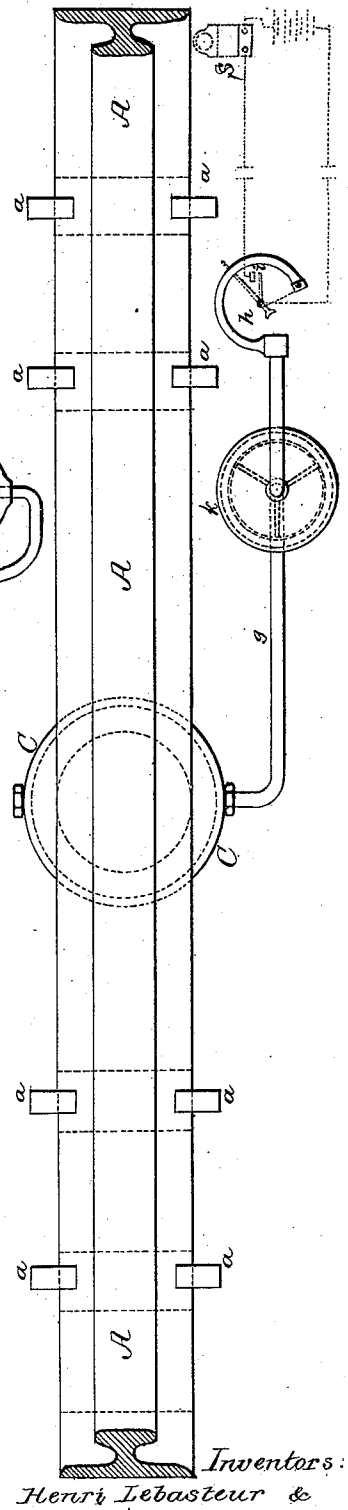


FIG. 2.

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by their Attorneys
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UNITED STATES PATENT OFFICE.

HENRI LEBASTEUR AND STANISLAS HENRI ROUART, OF PARIS, FRANCE.

APPARATUS FOR AUTOMATICALLY INDICATING OR SIGNALING THE PASSAGE OF TRAINS UPON RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 332,913, dated December 22, 1885.

Application filed May 15, 1885. Serial No. 165,611. (No model.) Patented in France December 10, 1884, No. 165,846; in Belgium March 11, 1885, No. 68,152; in England March 12, 1885, No. 3,258, and in Austria-Hungary July 1, 1885, No. 10,494.

To all whom it may concern:

Be it known that we, HENRI LEBASTEUR and STANISLAS HENRI ROUART, of Paris, France, and citizens of the Republic of France, have invented an Improved Automatic Train-Signaling Apparatus, (for which we have obtained patents in France, No. 165,846, dated December 10, 1884; in Belgium, No. 68,152, dated March 11, 1885; in England, No. 3,258, dated March 12, 1885, and in Austria-Hungary, No. 10,494, dated July 1, 1885,) of which the following is a specification.

This invention relates to an apparatus for indicating automatically and at a distance the passage of trains over the part of the track to which the said apparatus is applied.

The object of this invention is to enable a train on passing over any point on a railway to operate an apparatus, and thereby signal and give indication of the passage, either by working, signaling, or recording devices, or otherwise, on the spot, and also at the same time to give notice of its passage at any other point on the railway where required. When a train is passing over a railway-rail, the rail bends between the chairs or sleepers, under the weight of the vehicles, and although the extent of this deflection, which has been ascertained by measurement, be very slight it is nevertheless sufficient to actuate an apparatus possessing the requisite sensitiveness. These deflections of the rail are utilized for operating the apparatus hereinafter described.

In the accompanying drawings, Figure 1 is a side view of a section of rail to which our improvements have been applied, and Fig. 2 is a plan view of the same.

In a block, C, of cast-iron or other unyielding material, is formed a hollow or chamber closed by a very thin sheet, *f*, of brass joined at its edges to the cast-iron block, so that the hollow space in the block forms a closed chamber, with one side formed of flexible material. This chamber is filled with an incongealable liquid, and communicates through a pipe, *g*, with the tube of a Bourdon manometer, *h*. A block of steel, *e*, rests upon the sheet of brass. The apparatus thus arranged is placed under the rail A, as hereinafter described. A short length of rail, B, is attached, bottom upward, by means of claw-bolts *a* and distance-pieces *b*, to the under side of the ordinary rail, A, as indicated in Figs. 1 and 2 of the annexed drawings. The apparatus is placed between the rails A and B, the block of cast-iron resting upon the lower or inverted rail. The block of steel is brought into contact with the under side of the other rail by means of a wedge or incline, *d*, operated by a screw, *c*, as indicated in Fig. 1. When the apparatus is thus to a certain extent under pressure, every deflection of the rail has the effect of bulging the brass membrane, so as to press upon the liquid contained in the chamber and cause it to transmit the pressure to the tube of the manometer, the extremity of which is then subjected to a corresponding displacement. Under these conditions a deflection of one millimeter in the rail causes the extremity of the manometer-tube *h* to be displaced by upward of one centimeter. This movement is utilized to operate a contact-maker, *i*, which opens or closes an electric circuit, and thereby works an electric bell or other signal, S, as indicated by dotted lines in Fig. 2.

In order to preserve the sensitiveness of this apparatus, it is necessary to take the precaution of interposing a temperature-compensator in the passage for the liquid, because the arrangement of tubes for transmitting motion by means of a liquid resembles a thermometer with a metal case or tube. This thermometer being filled at mean temperature, the liquid contracts to a much greater extent than its case, and the diaphragm placed under the rail thereby becomes depressed to an extent which prejudices the action of the apparatus.

Any suitable description of compensator may be employed. For example, a chamber, K, of a metal such as zinc, which expands and contracts rapidly with changes of temperature, may be placed in the passage for the liquid, a block or mass of a material—such as marble, earthenware, glass, porcelain, and the like—not subject to rapid expansion or contraction being placed inside this chamber, so as to fill it almost entirely, only leaving space enough for an extremely thin film of liquid between it and the sides of the chamber.

The relative dimensions of the parts may

readily be calculated, so as to render the action of the apparatus unaffected by changes of temperature.

We claim as our invention—

1. The combination of the rail of a railway-track and a closed chamber beneath the rail and containing a liquid, with a manometric indicating device at a distance, and a connecting-pipe for transmitting the deflections of the rail to the indicator, substantially as described.

2. The combination of the rail of a railway-track and a closed chamber beneath the rail containing a liquid, with a manometric indicating device, connecting-pipe, and compensator, substantially as set forth.

3. The combination of the rail of a railway-track, a closed chamber beneath the same, a manometer controlled thereby, and an electric signal, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HENRI LEBASTEUR.
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Witnesses:
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