No. 668,819. Patented Feb. 26, 1901.

W. HUME.

RAILWAY SIGNALING APPARATUS.

(Application filed Oct. 6, 1898.)

(No Model.) 3 Sheets—Sheet 1.

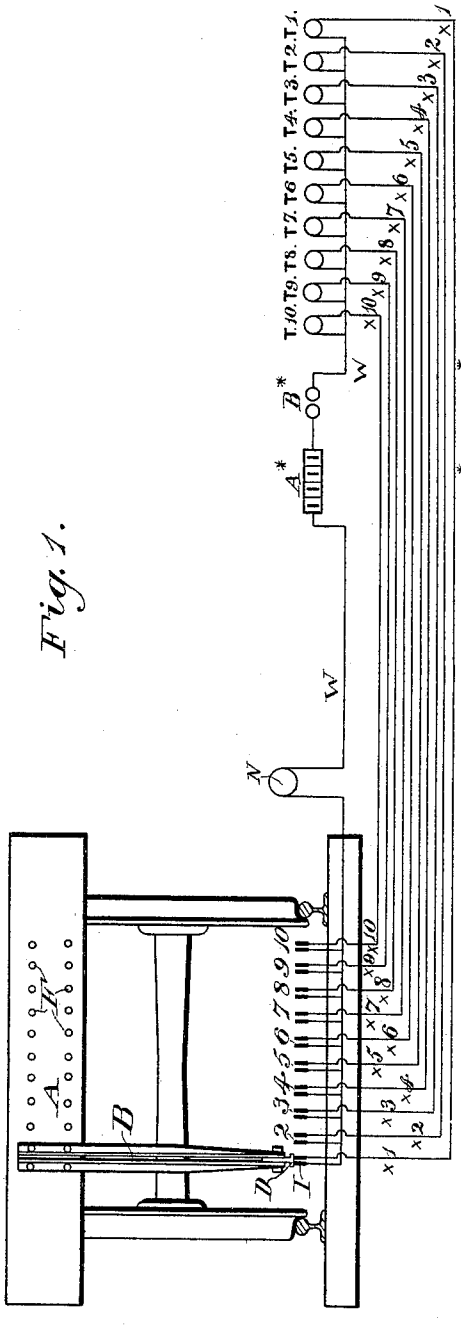

Fig. 1.

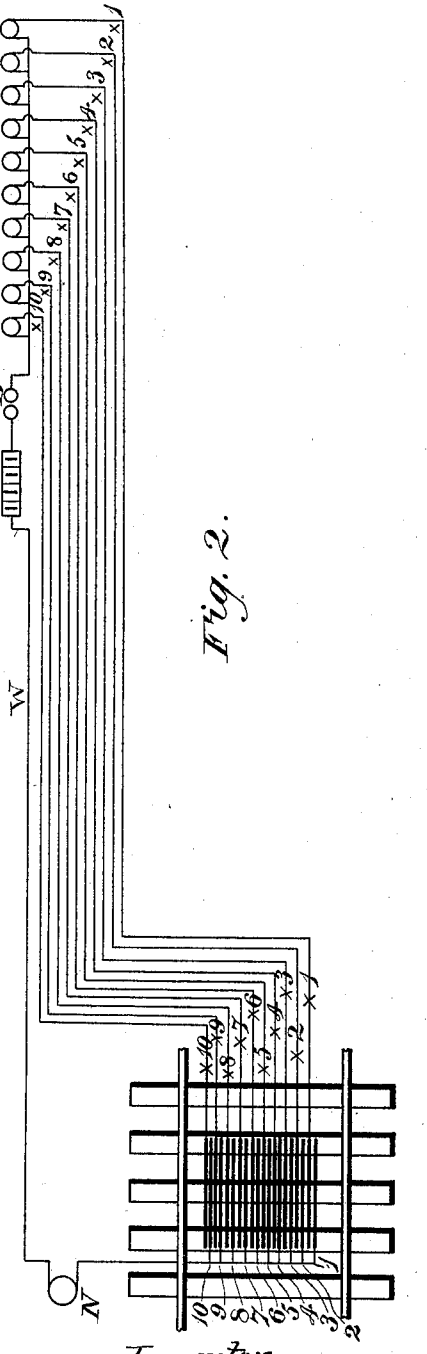

Fig. 2.

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3 Sheets—Sheet 2.

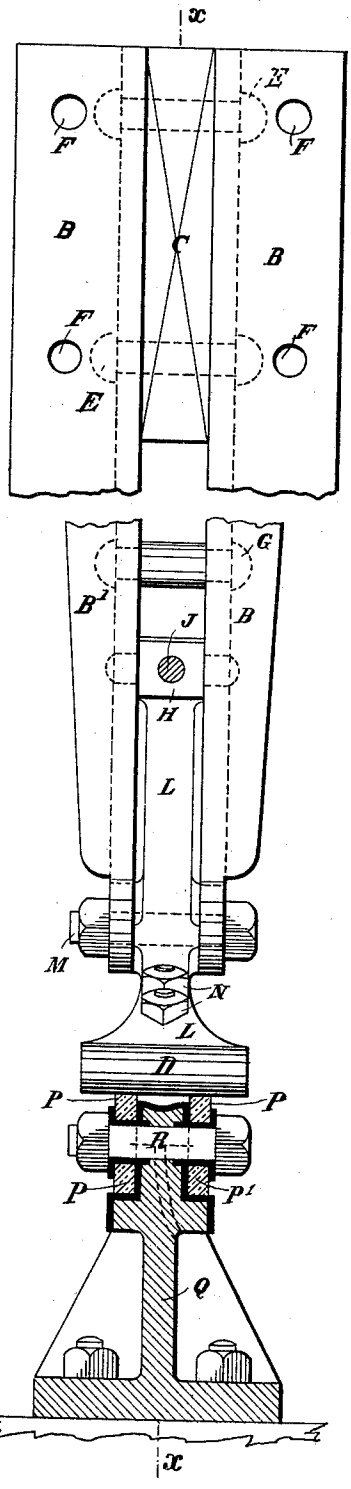

Fig. 3.

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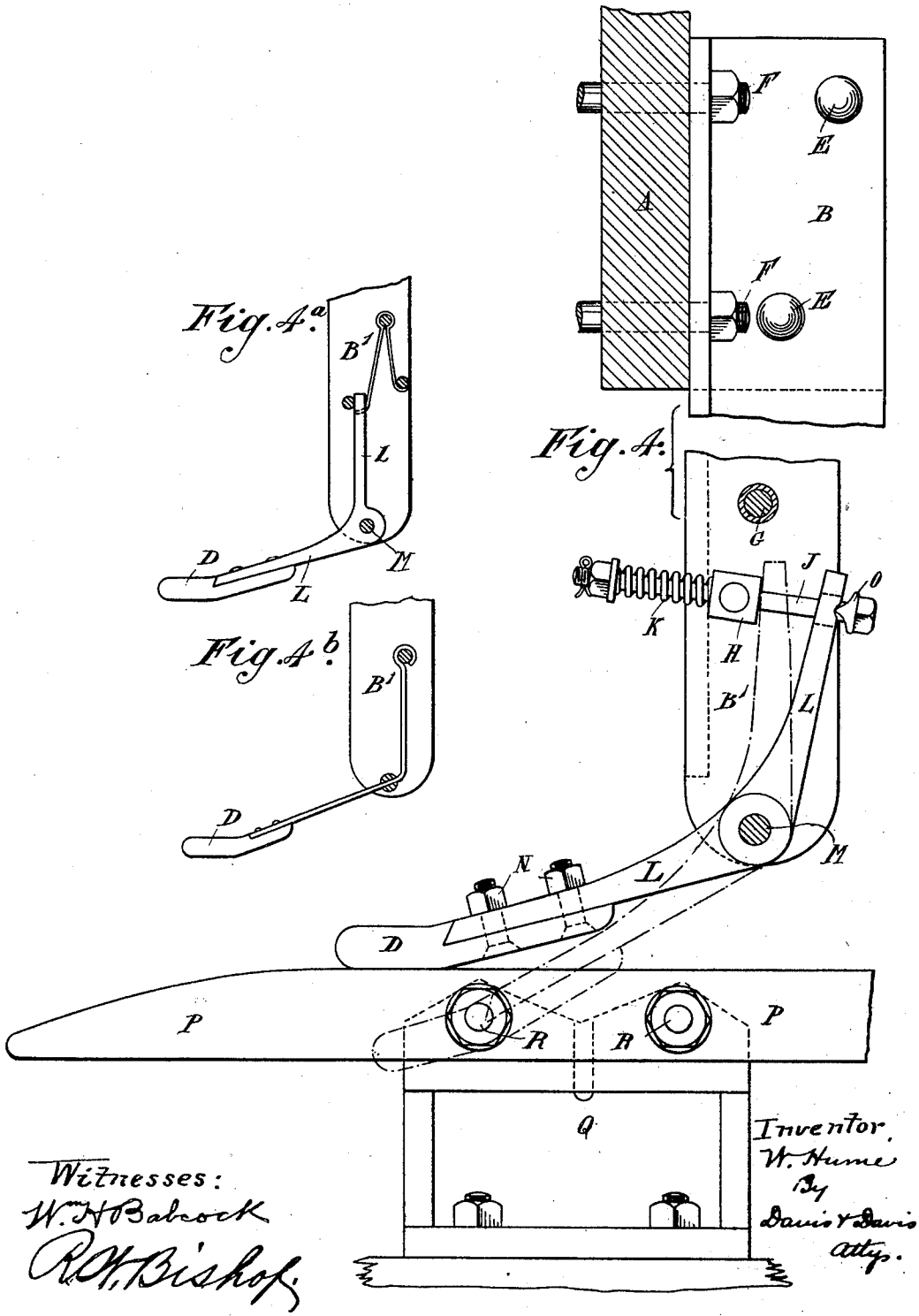

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UNITED STATES PATENT OFFICE.

WASHINGTON HUME, OF NEW BROAD STREET, COUNTY OF LONDON, ENGLAND.

RAILWAY SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 668,819, dated February 26, 1901.

Application filed October 6, 1898. Serial No. 692,843. (No model.)

To all whom it may concern:

Be it known that I, WASHINGTON HUME, a subject of the Queen of Great Britain and Ireland, residing at New Broad Street, in the county of London, England, have invented Improvements in Railway Signaling Apparatus, of which the following is a specification.

This invention of improvements in railway-signals has reference to means whereby railway trains or engines can cause their approach to be indicated at signal boxes or stations. The means I employ, as hereinafter explained, are such that in an automatic manner, by means of an appliance carried by an engine or some vehicle of a train, a signal or indicator will be electrically operated in such wise as to convey to those in charge of a signal box or station not only the fact that a train is approaching, but also which train it is according to its train-number, the object being to obviate or greatly lessen the liability to mistake one train or engine for another even when the train signaled is behind time and out of its order on the service time-table, and the system is such as to be especially useful in dark and foggy weather.

In describing the nature of my invention I will assume that the audible signals are to be produced by bells; but it will be understood that the word "bell" is to be taken to include any other equivalent and suitable sound-producing device.

For causing the approach of a train or of an engine to be indicated at a signal box or station I provide a number (conveniently ten) of pairs of bars of material that is a good conductor of electricity. The two bars of each pair are arranged parallel to one another, but are insulated from one another, and the several pairs of bars are arranged side by side (but insulated one pair from another) in the space between the two rails of the track and parallel with such rails. Each pair of bars is connected with a signal-bell common to the entire set and also with a separate train-number indicator located in the signal box or station and with an attention-bell which is common to all the pairs of bars and is located outside the tracks opposite the bars, these bars being for the purpose of signaling to the person in charge of the signal box or station. On the locomotive or on some other one of the vehicles of a train I provide an adjustable brush or equivalent whereby to bridge the space between the two bars of a pair when that part of the train carrying such device is passing over the particular pair of bars connected with the indicating devices above mentioned intended to indicate the approach of the particular train or locomotive.

In carrying out my invention each pair of bars may conveniently be supported on and secured to two or more cast-iron brackets bolted to the sleepers, and in order to insulate from one another the two bars constituting a pair, the heads of the brackets and the bolt securing the bars to them might be dipped in or coated with some non-conducting substance, or, alternatively, loose liners for the bracket-heads or sleeves for the bolts of any suitable non-conducting material might be used.

An arrangement according to this invention is illustrated, by way of example, in the accompanying drawings.

Figure 1 shows diagrammatically a cross-section through ten pairs of bars 1 2 3 4 5 6 7 8 9 10, such as above mentioned, and through the railway-rails, and it also shows the connections by wires with the attention and call bells, batteries, and train-indicators, as well as an end elevation of part of a vehicle with brush-carrier applied thereto. Fig. 2 is a diagrammatic plan of the same arrangements drawn to a smaller scale. Fig. 3 is a partial end elevation, partly in section, showing to a larger scale than Figs. 1 and 2 a portion of a buffer-beam with carrier contact-brush and a pair of conducting-bars and their support; and Fig. 4 is an elevation, partly in section, of the like parts in a plane at right angles to Fig. 3, the section being on the line $x x$ of Fig. 3. Figs. 4^a and 4^b are detail views showing modifications.

Referring to Figs. 1 and 2, it will be seen that one bar of each of the ten pairs (marked, respectively, 1 2 3 4 5 6 7 8 9 10) is connected up to a common single wire W, which passes through the "attention-bell," which is indicated at N and is located immediately alongside the track in front of the bars for the purpose of calling the attention of those in charge

of a train or locomotive during foggy weather or at night to the arrival of the train or locomotive at the bars and to warn them that they are approaching a station or signal. The wire W is connected through a battery A* and call-bell B* to ten train-indicators T' T^2 T^3 T^4 T^5 T^6 T^7 T^8 T^9 T^{10}, (all situated in the signal box or cabin.) The remaining bar of each of the ten pairs is connected by a separate and independent wire with its corresponding indicator in the signal-box. The ten wires are marked, respectively, X' X^2 X^3 X^4 X^5 X^6 X^7 X^8 X^9 X^{10}.

The object of the call-bell B* is to advise the signalman of the approach of a train.

The pairs of bars and their corresponding indicators are intended to be used consecutively by the trains, beginning with No. 1 and proceeding onward up to No. 10, after which the operation can be repeated as often as necessary, beginning again at No. 1. Conveniently the pairs of bars marked 1 might be used to signal trains Nos. 1, 11, 21, and so on, (each such train carrying a correspondingly-located brush,) while the bars 2 would be used to signal trains Nos. 2, 12, 22, and so on up to any required number of trains, the brushes being correspondingly arranged on the trains.

The buffer-beam A of the locomotive, Fig. 3, is drilled to templet to take the holding-bolts for securing a vertical brush-carrier B at will in either of ten different lateral positions corresponding to those of the pairs of bars mounted 1 to 10, inclusive, so that the brush can be placed in the proper position corresponding to the number of the particular train the engine is to draw. The brush D (which may be of brass, gun-metal, or other suitable metal) is carried at the lower end of the carrier B. Thus it will be understood that with the holes spaced as above stated the carrier B can practically at a moment's notice be fixed in or shifted into the position that will correspond with any particular pair of bars the number of which will agree with the number which the particular train bears in the service time-table, and it is not needful to always use a given locomotive to draw a given train. It is to be noted that the upper surfaces of the pairs of contact-bars are downwardly inclined at those ends the brush is intended to first touch in order that the brush may make contact and gradually rise up the inclines in a manner to close the circuit without shock. When the brush D by touching both bars of any pair at once closes the circuit, the attention and call bells N and $B^\times$, respectively, are caused to ring and the corresponding indicator-flap is opened in the signal box or station, thus facilitating recognition of any particular train and obviating or mitigating liability to error.

Referring to Figs. 3 and 4, it will be seen that the brush D is shown hinged to the lower end of the carrier B and provided with a spiral spring K to insure contact. The brush-carrier comprises a couple of angle-bars B B, (of suitable material, such as steel,) with an interposed filling-piece C, and E E are rivets that fasten B B and C together. F F are holes for the bolts, whereby to fasten the brush-carrier to the buffer-beam A. From the description already given it will be understood that such holes are to be equally spaced across the buffer-plate A, so as to correspond with the spacing and number of the pairs of bars on the track and with the distance center to center of bolts F F. Some of them may be on one side of the draw-gear and the remainder on the other side, provided the pairs of bars on the track be correspondingly arranged. The lower portions B' of the angle-bars B B have their side flanges gradually tapered off. (See Fig. 3.) G is one of several rivets at intervals to hold the portions B' of the bars together. H is a block on trunnions to receive the thrust of the spring K, which is adapted to cause the lever L, which is movable about a pin M and to which the brush D is secured by bolts N, to press the brush against the contacts. O is a washer with a knife-edge-like base to allow of the radial movement of the lever L. Instead of the spiral spring K, the trunnion-block H, and the bolt J a V-shaped spring K' might be arranged between the angle-bars (see Fig. 4^a) so that one end bears against an abutment K^2, carried thereby, and the other against the lever L, so as to cause the brush D to be pressed against the pair of contact-bars, or instead of either of the before-described arrangements the brush may be carried by a flat spring K^3, Fig. 4^b, suitably fastened to the angle-bars.

In Fig. 3 a pair of contact-bars is shown in cross-section, the bars being marked, respectively, P and P'. Their ends are tapered, as shown, or they may be downwardly bent. Q is a cast-iron pedestal or bracket bolted to the sleeper of the track for carrying the bars which are held to the pedestal Q by bolts R. The thick heavy black lines at the top of the pedestal Q and around the ends of the bolt R represent the non-conducting material necessary to insulate the bar P from the bar P'.

In connection with each up and each down line there would be provided a signaling arrangement such as above described, the respective indicators of which at the signal box or station are distinctively marked and grouped. At junctions each independent line would be similarly provided and the separate signaling arrangements would be marked, so as to avoid confusion.

What I claim is—

1. Railway signaling apparatus comprising pairs of insulated contacts arranged on the track, corresponding indicating devices located at a signal box or station, a source of electricity, electrical connections between each of said pairs of contacts, each of said indicating devices and source of electricity, an audible signaling device located at said signal

box or station, an audible signaling device located in proximity to said pairs of contacts, said audible signaling devices being adapted to operate each time a circuit is completed through any pair of said contacts, and a circuit-closing device carried by the vehicle whose approach is to be notified, and arranged to make contact with a prearranged pair of said contacts, substantially as described.

2. Railway signaling apparatus comprising longitudinal pairs of insulated bars spaced apart across the track, corresponding train-number indicators located at a signal box or station, electrical connections between one of the bars of each pair and one terminal of the corresponding train-indicator, an electric battery, an audible signaling device located at said signal box or station, an audible signaling device located in proximity to said insulated bars, a conductor connecting said battery and audible signaling devices and connected with and common to the second bar of each pair and to the second terminal of each of said indicators, and a contact-piece mounted in a prearranged position on the vehicle whose approach is to be notified so as to complete the circuit between the corresponding pair of bars when passing over the same, substantially as described.

Signed at the city of London, England, this 22d day of September, 1898.

WASHINGTON HUME.

Witnesses:
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H. W. ALLISON.