(12) UK Patent Application (19) GB (11) 2 419 624 (13) A

(43) Date of A Publication 03.05.2006

(21) Application No: 0423789.7

(22) Date of Filing: 27.10.2004

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(51) INT CL:
B61L 29/08 (2006.01) **B61L 29/24** (2006.01)

(52) UK CL (Edition X):
E1G G91A

(56) Documents Cited:
GB 0367393 A **GB 0282944 A**
JP 2000238641 A

(58) Field of Search:
INT CL[7] **B61L, E01F**
Other: **Online: WPI, EPODOC, JAPIO**

(54) Abstract Title: **Railway level crossings**

(57) Apparatus is disclosed for use at a railway level crossing having gates or barriers (3) which can be opened or closed or raised or lowered. The gates or barriers are provided with detection device (4) comprising switches and relays, for detecting whether at least one of the gates is open or closed or whether at least one of the barriers is raised or lowered. Warning devices (5) such as light beacons or LED displays, are connected to the detecting device for providing a warning indication to a user of the crossing that at least one of the gates is open or at least one of the barriers is raised. The LED display can be a double sided sign panel showing a warning text.

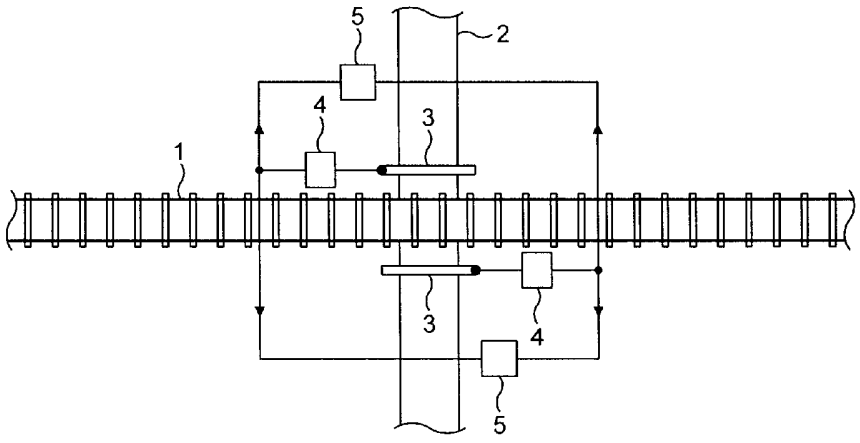

FIG. 1

GB 2 419 624 A

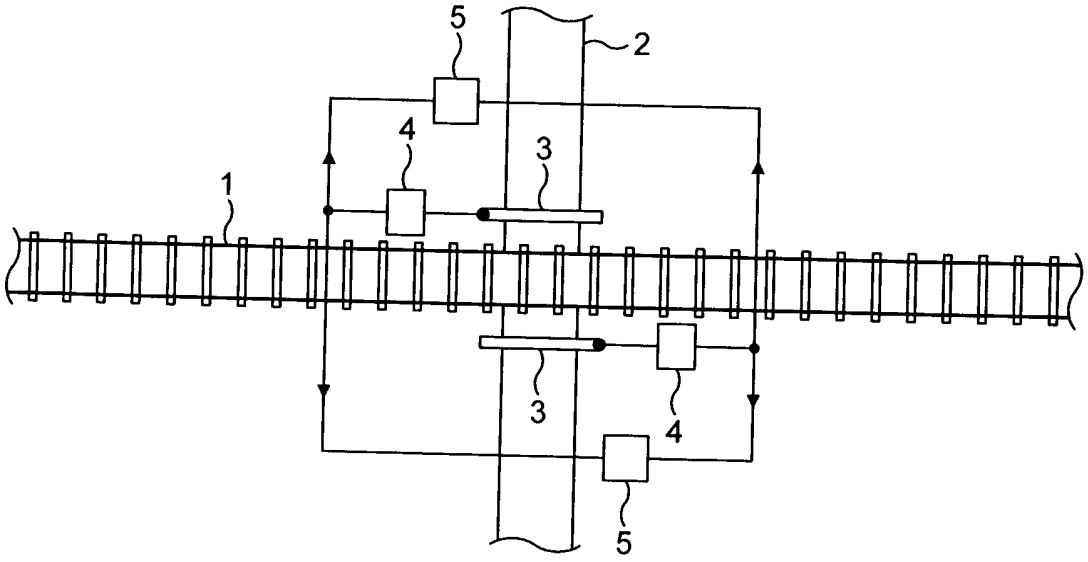

FIG. 1

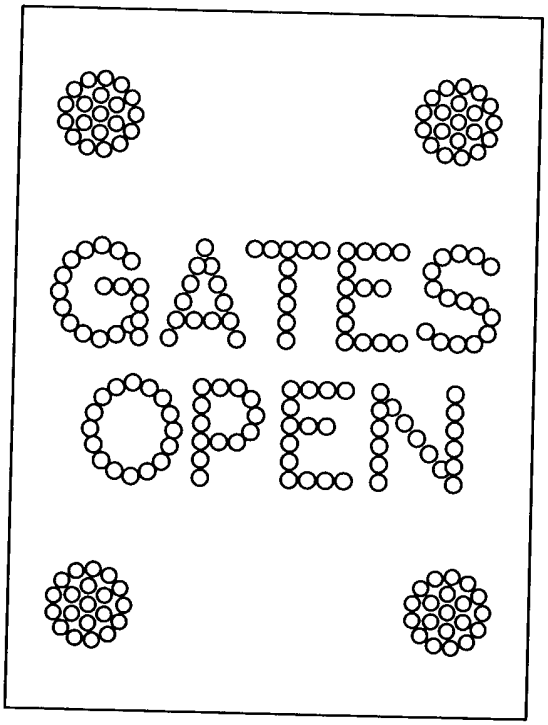

FIG. 2

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RAILWAY LEVEL CROSSINGS

The present invention relates to railway level crossings, in particular to detecting that the gates or lifting barriers of a railway level crossing have been closed or lowered.

User worked crossings (UWCs) are common in the UK (there are over 4,000 currently in use). At this type of level crossing, the responsibility for correct operation lies entirely with the user.

The crossing is always fitted with gates or lifting barriers to fence off the railway, and when fitted with gates the user must take the following actions when crossing the railway:

park vehicle on the approach to the level crossing and open the nearside gate;
cross over the railway and open the level crossing gate on the far side;
cross back over the railway, embark the vehicle, and then proceed over the railway after first making sure that it is safe to do so;
disembark the vehicle, cross over the railway to the near side and close the gate; and
re-cross the railway, close the far side gate, and drive away from the crossing.

With lifting barriers, the number of crossing traversals required can be reduced.

Whichever method is employed, if the user either chooses not to close the gates or lower the barriers or inadvertently forgets to do so, there is no detection or indication that the crossing is still open to road users. This can have potentially catastrophic consequences – the next user of the level crossing is likely to be distracted by the open crossing (they may in fact be accustomed to the fact that an open crossing generally signifies that there is no train approaching) and will tend to then ignore warning signs and/or lights.

According to the present invention, there is provided apparatus for use at a railway level crossing having gates which can be opened or closed or barriers which can be raised or lowered, comprising:

detection means for detecting whether at least one of the gates is open or closed or whether at least one of the barriers is raised or lowered; and

indicating means for connection to the detecting means for providing a warning indication to a user of the crossing that at least one of the gates is open or at least one of the barriers is raised.

The indicating means could provide a visual indication. In this case, the indicating means could comprise a light beacon or provide a warning message.

The indicating means providing a visual indication could comprise an LED display.

The apparatus could have first and second such indicating means for location on opposite sides of the crossing.

The apparatus could have first and second such detecting means for respective ones of the gates or barriers, the indicating means being for connection with both of the detecting means.

The present invention also comprises a railway level crossing provided with apparatus according to the invention.

The present invention will now be described, by way of example, with reference to the accompanying drawing, in which:-

Fig. 1 is a schematic diagram of a user worked railway level crossing incorporating an example of the invention; and

Fig. 2 shows the display of an example of means for warning a user.

Referring to Fig. 1, reference numeral 1 designates a length of railway track traversed by a roadway 2, there being a user worked level crossing where the roadway 2 crosses the track 1 and comprising a pair of gates or lifting barriers 3, one on each side of the track 1. Each of gates or barriers 3 is provided with detection means 4 for detecting whether the gate is open or closed or whether the barrier is raised or lowered. On each side of the crossing there is warning means 5 connected to the detection means 4 for producing a warning if one or both of the gates or barriers 3 is open or raised.

Where gates are employed, the detection means 4 to detect the closed state of the gates may use passive industrial magnetic reed switches located within the gate enclosure, the reed switches being closed when the gates are closed. A voltage will be applied to the coils of a relay when the reed switches are closed such that the relay will be energised when both gates are closed, and de-energised when either or both of the gates is or are not fully closed.

Where lifting barriers are employed, the detection means 4 may detect the positions of the barriers using industry standard practice.

As regards the warning means 5, two alternative types of visual indication warning means will be described. In both cases, each warning means could be located on a post on the exit side of the crossing (one on each approach) approximately 20m past the crossing. The first type, known as the Hymas Beacon, consists of a rotating amber beacon. This beacon will be illuminated and rotate at any time that both gates are not fully closed or both barriers are not fully lowered.

The second type of visual indication system proposed comprises a double-sided sign panel 800mm high x 600mm wide with light-emissive diode (LED) lights. An example of a typical display of such a device is shown in Fig. 2. The device has four amber lights on each side. When activated, the amber lights flash alternatively in pairs, first the top two lights, then the bottom two lights. At all times that the device is activated, warning text will be displayed in white, red or amber text e.g. "Gates Open" or "Warning Gates Open". The text on the front and rear may differ.

The current state of the gates/barriers will be detected at all times. If at least one of the gates are left open or at least one of the barriers raised for an excessive length of time (the length of time to be considered excessive will vary from site to site), a failure alarm may be provided to a remote site. This may take the form of an audible and/or visible alarm, and may be transmitted from the crossing to the remote monitoring point by a variety of means e.g. SMS, GPRS, direct cable, etc.

The above described arrangements provide for additional protection at user worked crossings with regards to the potential for a gate or gates being left open or a barrier or barriers being left raised.

To summarise, the arrangements provide:

a system to detect whether the gates are open or closed (or whether barriers are raised/lowered if provided);

a visual indication system to provide both a reminder to the current user that the gates/barriers must be closed/lowered, and also to subsequent users that the gates/barriers may have been left open/raised by the previous user; and

an alarm facility to provide failure alarms to a remote point.

CLAIMS

1. Apparatus for use at a railway level crossing having gates which can be opened or closed or barriers which can be raised or lowered, comprising:

detection means for detecting whether at least one of the gates is open or closed or whether at least one of the barriers is raised or lowered; and

indicating means for connection to the detecting means for providing a warning indication to a user of the crossing that at least one of the gates is open or at least one of the barriers is raised.

2. Apparatus according to claim 1, wherein the indicating means provides a visual indication.

3. Apparatus according to claim 2, wherein the indicating means comprises a light beacon.

4. Apparatus according to claim 2, wherein the indicating means provides a warning message.

5. Apparatus according to claim 2 or 4, wherein the indicating means comprises an LED display.

6. Apparatus according to any preceding claim, having first and second such indicating means for location on opposite sides of the crossing.

7. Apparatus according to any preceding claim, having first and second such detecting means for respective ones of the gates or barriers, the indicating means being for connection with both of the detecting means.

8. A railway level crossing provided with apparatus according to any preceding claim.

INVESTOR IN PEOPLE

Application No: GB 0423789.7
Claims searched: 1 - 8

Examiner: Jens Skou
Date of search: 9 March 2005

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X, Y	X: 1-4, 6-8 Y: 5	GB 0282944 A	(GARDNER) See page 1, line 9 - 49 and 90 - 95.
X	1-3, 6-7	GB 0367393 A	(HADDAN) See page 1, line 12-20; page 5, line 123-126; and page 6, line 12-32; and figure 1 and 8.
Y	5	JP 2000238641 A	(SANKOSHA CO LTD) See WPI abstract Acc. No. 2000-577048 [54] and figure 1.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[X]:

Worldwide search of patent documents classified in the following areas of the IPC[7]:

B61L, E01F

The following online and other databases have been used in the preparation of this search report:

WPI, EPODOC, JAPIO