Ingenuity Unlimited

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Each idea submitted must be accompanied by a declaration to the effect that it has been tried and tested, is the original work of the undersigned, and that it has not been offered or accepted for publication elsewhere. It should be emphasised that these designs have not been proven by us. They will at any rate stimulate further thought.
Articles submitted for publication should conform to the usual practices of this journal, e.g. with regard to abbreviations and circuit symbols. Diagrams should be on separate sheets, not in the text.

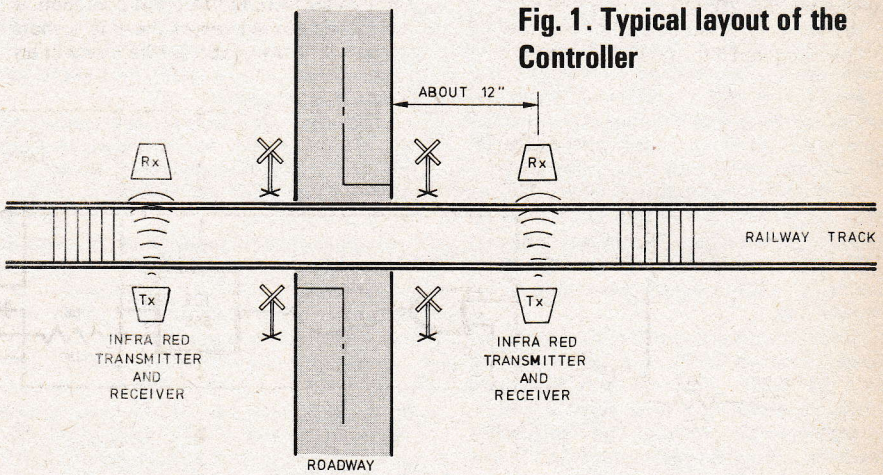
INTELLIGENT LEVEL CROSSING WARNING LIGHTS CONTROLLER

MODEL railway enthusiasts have lots of tiny road signs available with built-in l.e.d.s. This circuit provides automatic control of level crossing lights, without affecting the railway circuitry. This is achieved with the use of two infra-red beams shone across the track.

The circuit is bi-directional, in as much that the direction of the train is irrelevant, because the circuit can 'remember' which detector was interrupted first. It will then concentrate on the second detector to establish when the train is clear of the roadway. Fig. 1 shows the general layout.

As the circuit consists of two identical parts, only one part is described. If the train breaks either beam, say from D1, then the output from TR1 will go low. VR3 and C1 allow a small delay before allowing IC7a to go low. This prevents the circuit from being affected by breaks in the train between carriages.

Fig. 1. Typical layout of the Controller



At this point the output of IC7b will set the latch IC1a; this in turn feeds an Ex-Or gate which sets the final latch. The output of this latch should be connected to a simple flasher unit.

When the train has cleared the first detector, the beam is re-established. The train will then break the second beam and the same action will occur, except that the Ex-Or gate will give a low output. This will reset the input to the final latch, IC3.

Re-establishment of the second beam will cause the output of IC2 to go high which will send a reset pulse to IC1a, IC1b and IC3. This will cause the final output to go low and the flasher circuit will be turned off. The infra-red beam works well on any track layouts, up to two N-Gauge tracks. If a wider gap is used, then an amplifier circuit will be required to pulse the transmitter.

R. S. Bacon,
Luton,
Beds.

Fig. 2. Circuit diagram of the Controller