

Improvements in or relating to power-operated signal control systems for railways and the like

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Claims of **GB 770187 (A)**

What we claim is:-

1 A power-operated signal control system as herein defined, wherein both the slide bars and the interlocking bars are flat metal strips, separate pieces of metal being secured thereto by bolts, screws or the like to form the dogs and the projections on the interlocking bars co-operating with the said dogs.

2 A power-operated signal control system as herein defined, wherein the slide bars of the interlocking mechanism are uniformly spaced one from another, and the interlocking bars are also spaced uniformly one from another, both the slide bars and the interlocking bars being flat metal strips pierced at regular intervals to receive bolts, screws or the like, pieces of metal of predetermined shape and dimensions being secured to the said strips by such bolts, screws or the like the pieces secured to the slide bars forming the dogs or like projections thereon, and the pieces secured to the interlocking bars co-operating with the said dogs to displace the interlocking bars as the result of movement of the slide bars or to prevent movement of a slide bar when an interlocking bar is in a predetermined position

3 A power-operated signal control system according to Claim 1 or 2, wherein the contacts are operated directly by the rods to which the slide bars are coupled, each of the said rods having the contact operating mechanism at one end, and power actuating means for operating the rod from a remote point at the other end, the mechanical interlocking mechanism, an electric lock for retaining the rod in a set position until the train movement for which it was set has been completed, and a manual operating lever, being arranged along the rod in that order between the power actuating means and the contact operating mechanism

4 A power-operated signal control system according to Claim 3, wherein the rods are arranged vertically in a substantially upright frame provided with vertically adjustable feet to enable it to be accurately levelled regardless of irregularities in the floor surface on which it is supported.

A power-operated signal control system as herein defined, substantially as described with reference to, and as shown in, the accompanying drawings.

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PROVISIONAL SPECIFICATION Improvements in or relating to Power-operated Signal Control Systems for Railways and the Like We, BRITISH TRANSPORT COMMISSION, a Public Authority, established by the Transport Act, 1947, of 55, Broadway, Westminster, London, S W 1, and ROBERT DELL, of 51, Eton Avenue, Sudbury, in the County of Middlesex and VALTER OWEN, of 19, Lomond Close W 1 Vembley, in the County of Middlesex, both British Subjects, do hereby declare this invention to be described in the following statement: This invention relates to power signalling systems for railways and the like, the term "signalling" being intended to include all the normal controlling operations performed from a signal cabin, such as the actuation of signals and the setting of points at junctions.

It has already been proposed in such power signalling systems to control the points and signals by means of contacts operated by turning movement of a rod, which rod is coupled to a manual operating lever and to a second similar rod in an interlocking frame, the rods in the interlocking frame associated with a plurality of signals, points or other operated devices being each coupled to one of a plurality of slide bars so that angular movement of a rod is accompanied by rectilinear movement of the corresponding slide bar The slide bars carry dogs or projections cooperating with notches in interlocking bars extending in a direction perpendicular to that of the slide bars the dogs or projections and the notches being so arranged that movement of one or more of the slide bars can take place only when another of those bars is in a predetermined position Power means controllable from a remote point are provided, in addition to the manual levers, for operating the contact actuating rods.

A principal object of the present invention is to improve, and facilitate the assembly of an interlocking mechanism as above set forth, and a further object is to improve and simplify the apparatus consisting of the interlocking mechanism and the point and signal control contacts.

According to one feature of the invention.

the slide bars are uniformly spaced one from another, and the interlocking bars are also spaced uniformly one from another, both the slide bars and the interlocking bars being flat metal strips pierced at regular intervals to receive bolts, screws or the like, additional pieces of metal of predetermined shape and dimensions being secured to the said strips by such bolts, screws or the like, the pieces secured to the slide bars forming the dogs or like projections thereon, and the pieces secured to the interlocking bars define between them the notches co-operating with the dogs.

According to another feature of the invention the contacts are operated directly by the rods to which the slide bars are coupled.

each of the said rods having the contact operating mechanism at one end, and power actuating means for operating the rod from a remote point at the other end, the mechanical interlocking mechanism, an electric lock for retaining the rod in a set position until the train movement for which it was set has been completed and a manual operating lever being arranged along the rod in that order between the power actuating means and the contact operating mechanism.

The rods are preferably arranged vertically in a substantially rigid upright frame provided with vertically adjustable feet to enable it to be accurately levelled regardless of irregularities in the floor surface on which it is supported.

In one arrangement according to the pre-75 invention which will now be described by way of example a signal interlocking machine comprises an upright rectangular frame, built up conveniently from H-section girders and having vertically adjustable feet at its lower corners to enable it to be set in a truly level position Brackets mounted on one side of the frame carry bearings for a plurality of equally spaced vertical rods arranged side by side in a common plane parallel to that of the frame Each of the rods is movable through a predetermined angle by power means such as a double-acting air pressure motor or a pair of solenoids.

the power means being controlled from a re 90 mote point The power means act on the lower end of th, rod, and the upper portion of the rod by its ancular movement, operates contacts controlling a particular signal or set of points Mechanical interlocking 95 means are positioned immediately above the power means, said interlocking means comprising a horizontal slide bar associated with each rod and a plurality of vertical interlocking bars co-operating with the slide bars 100 Further details of the mechanical interlocking means are given below Above the mechanical interlocking means each rod has fixed thereto a quadrant co-operating with a solenoid-operated locking member the solenoid 105 of which is energised by the setting of the corresponding signal or other device for a desired train movement to lock the rod in the appropriate angular position, and is released automatically when that movement is 110 completed Between the quadrant and the switch operating mechanism a hand lever is mounted on the rod the hand lever serving both for manual operation of the rod and as an indication of its position 115 It will be evident that the arrangement of the various mechanisms in the relative positions stated above ensures that the contacts cannot be operated unless the mechanical interlocking means and the electric lock are 120 also operated.

Referring again to the mechanical interlocking means the slide bars are arranged one above another at equal intervals and each slide bar is either formed with rack 125 teeth engaging a toothed quadrant on the rod with which it is associated or carries a pin engaging in a slot in an arm fixed to the rod Each slide bar comprises a flat metal strip drilled with a row of equally spaced 130 770,187 tapped holes along its length, to receive screws, bolts or the like for securing thereto one or more flat metal plates forming dogs Each flat metal plate is formed with two plain holes to receive screws or bolts passing through it into two adjacent holes in the slide bar.

The interlocking bars lie side by side and are equally spaced one from another, the said bars each comprising a flat metal strip which, like the strips forming the slide bars, is drilled with a row of suitably spaced plain holes Notches to co-operate with the dogs on the slide bars are defined by the ends of short pieces of metal secured to the interlocking bars by screws, bolts or the like passing through the holes in said bars, each short piece of metal being formed with two tapped holes spaced apart by the same distance as the holes in the interlocking bars.

It will be seen that by suitably relating the spacing of the holes in the slide bars to the intervals between the interlocking bars, and by suitably relating the spacing of the holes in the interlocking bars to the intervals between the slide bars, it is possible to mount a dog on any slide bar in a position to cooperate with any interlocking bar, and it is also possible to mount pieces defining a notch on any interlocking bar to co-operate with a 30 dog on any slide bar.

The interlocking mechanism according to the invention operates in the known manner, that is to say a slide bar which, when moved to a certain position, is desired to lock other 35 slide bars against movement, carries a dog formed with a ramp co-operating with a corresponding ramp leading into a notch on an interlocking bar to lift the said interlocking bar as the slide bar moves to the appropriate 40 position, the lifting of the interlocking bar moving notches therein out of alignment with dogs on the slide bars which are to be prevented from moving.

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