April 19, 1955 J. C. MOCK 2,706,772

RAILWAY SWITCH CIRCUIT CONTROLS

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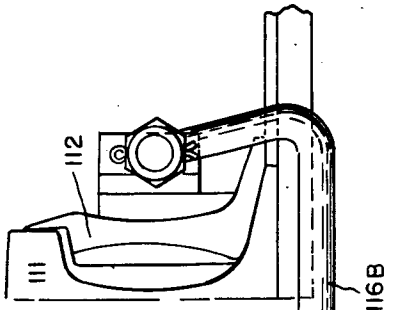


FIG.8.

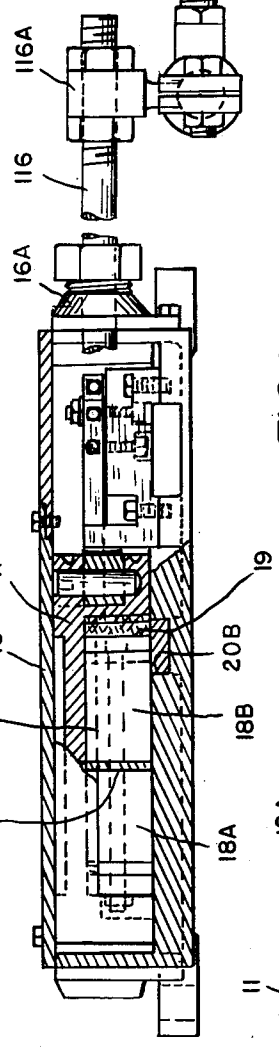


FIG.2.

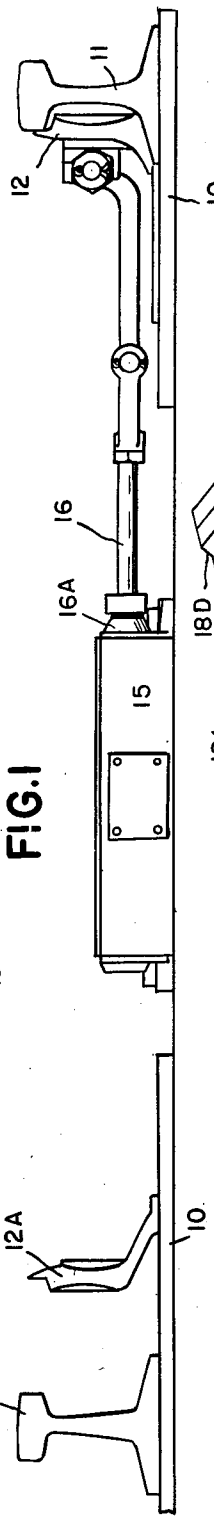


FIG.1

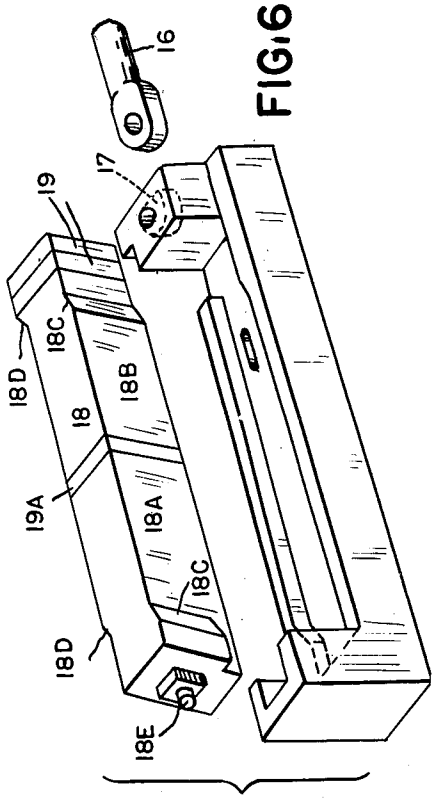


FIG.6.

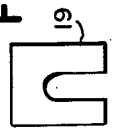


FIG.7.

INVENTOR.
JAMES C. MOCK
BY Hauke & Handesty
ATTORNEYS

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FIG. 3.

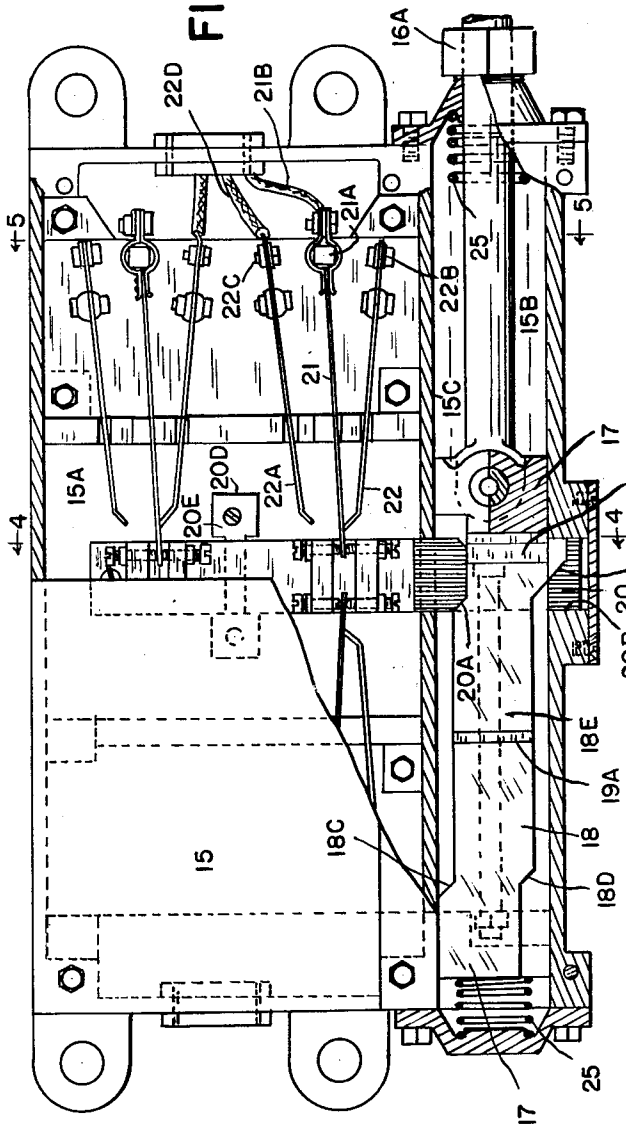


FIG. 5.

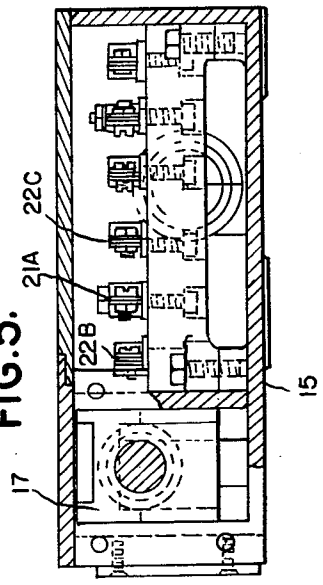
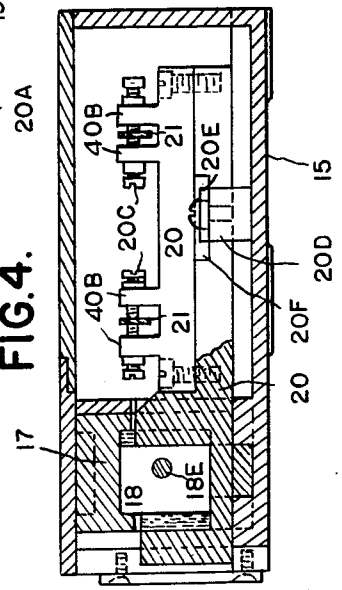


FIG. 4.



INVENTOR.

JAMES C. MOCK

BY Hauke & Hardesty

ATTORNEYS

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2,706,772

RAILWAY SWITCH CIRCUIT CONTROLS

James C. Mock, Detroit, Mich.

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2 Claims. (Cl. 246—253)

The present invention relates to circuit controls for railroad switches and particularly to the circuit control mechanism located adjacent to and actuated by the movement of the switch point.

In conventional installations of such control devices, the box containing the electrical making and breaking contacts is usually located on a tie end extension and actuated from the switch point by means of a rod extending under a rail to a swinging arm or crank carried by the box.

This location of the box is at a point of great vibration from passing rolling equipment and also requires the elimination of considerable ballast material to provide clearance for the crank and actuating rod.

Further, the crank arrangement necessarily produces bending stresses in the actuating rod with breaks often resulting.

Among the objects of the present invention is to provide a switch circuit control of such construction as to permit installation between the railroad rails where vibration is the least.

Another object is to provide a control installation in which all of the moving parts have a horizontal straight line motion.

Another object is a circuit control construction which will permit its being housed in a sufficiently low vertical dimension as to allow its installation upon a tie between the rails.

Still another object is a switch control without springs, except the "safety" springs which are within the housing and thus protected.

Other advantages and objects will readily occur to those skilled in the art upon reference to the following description and accompanying drawings in which:

Fig. 1 is a side elevation showing the complete control.

Fig. 2 is a side elevation of the control with parts in section.

Fig. 3 is a plan view of the circuit box with the cover partly removed.

Fig. 4 is a section on line 4—4 of Fig. 3.

Fig. 5 is a section on line 5—5 of Fig. 3.

Fig. 6 is an exploded perspective view of the cam block and carrier.

Fig. 7 is a view in elevation of an adjusting shim.

Fig. 8 is a partial view of a modification used when the control box is located outside of the rails.

In the drawings, the base line of Fig. 1 represents the upper surface of a railroad tie upon which are mounted the conventional bearing plates **10** and rails **11**, while conventional switch points are shown at **12** and **12A**.

Also mounted upon the tie, between rails **11**, is a circuit control box **15** containing the circuit making and breaking contacts.

Although not shown in the drawings, the switch points **12**—**12A** will be hinged in the conventional manner and tied together by means of tie rods so that when the point **12** is against its adjacent rail **11**, the point **12A** will be spaced from its adjacent rail a considerable distance, and vice versa.

From one of the switch points **12**, an operating rod **16** extends to and into one compartment **15B** of the control box **15** through a gland **16A** and is attached to a cam block carrier **17**, this being an inverted U-shaped element into which the cam block **18** is inserted from below.

This cam block **18**, as shown in Fig. 6, comprises a two part block **18A** and **18B** which parts may be identical. Each of these parts consists of a body portion having adjacent one end cam surfaces **18C** and **18D**, these being inclined surfaces arranged on opposite sides of the body and inclined in the same direction. When the two parts **18A** and **18B** are assembled, all four cam surfaces are inclined in the same direction.

The cam block is preferably located in the carrier by means of shims **19** of which there may be several of different thicknesses. By making the cam block **18** in two portions as indicated and assembling the two parts with a shim **19A** between, accurate location of the cams **18C** or **18D** relative to each other may be had. Further, by shifting one or more of the shims **19** to the other end of the cam block, accurate location, within a limited range, of the block in the carrier may also be had.

As illustrated in Figs. 3 and 6, the cam block **18** is assembled into a unit by means of a bolt **18E** extending lengthwise through the parts **18A** and **18B** and shim **19A**.

As seen best in Figs. 3 and 4, the cam block **18** is arranged to cooperate with a slide **20** having at one end a rectangular notch embracing the cam block and having cam surfaces **20A** adapted to contact the cam surfaces **18C** and **18D**, to be moved thereby in a suitable guideway **20B**.

The slide **20** extends laterally through the partition **15C** into the contact containing portion **15A** of the box **15** and carries an insulating block provided with abutments **40B** arranged in pairs and provided with adjusting screws **20C** for adjusting the gap between the members of a pair.

Arranged to lie between the members of each pair of abutments is a spring current carrying arm **21**, anchored at **21A** and connected through lead wire **21B** to a suitable current source. Arranged on each side of arm **21** is a pair of spring arms **22** and **22A** anchored respectively at **22B** and **22C** and having their free ends spaced a short distance but sufficiently close to allow the arm **21** to contact one or the other when moved by the slide. The arm **22A** is connected to its signal and or train control circuit through lead **22D** while the arm **22** is connected to another signal or train control circuit.

As shown, the box **15** contains four sets of spring contact arms such as **21**, **22**, etc. and these will be connected to suitable current source and to signal and train control circuits in conventional manner, such circuits not being shown as they do not constitute part of the present invention.

In addition to the guideway **20B**, the slide **20** may be further maintained in its rectilinear movement by means of the guide blocks **20D** and a stirrup or hold down bar **20E** extending through a suitable slot **20F** in the slide.

It should be noted that in devices of this kind, the switch points **12**, when operating properly, move a considerable distance from one position (open switch) to the other (closed switch), but it is necessary that signal change be accomplished during the initial movement. It is also necessary that the new circuit setting be not made until the switch points are substantially at the new position.

Accordingly, the cams **18C** and **18D** should be quite accurately located and should provide for moving the slide **20** quickly and at the ends of a considerable open circuit or neutral zone. In the present case, this is accomplished by the adjustability of the length of the cam block and by the use of the shims **19** to locate the block in the carrier.

Further, it is necessary that means be provided to indicate danger whenever the switch points move out of proper position due to breakage, wear or bad adjustment. Such indication in the present structure is provided for by the use of springs **25** located in the ends of the guide chamber **15B** for the cam block carrier **17**, and adapted to be put under compression during the final short movement of the carrier.

As just stated, the springs **25** are put under com-

pression during the final short movement of the carrier. The distance traversed by the carrier in this compression movement is the same or slightly more than the horizontal distance between the ends of cam **18C** or **18D**. When, therefore, all adjustments are in order, the springs merely remain compressed. On the other hand, if such adjustments are not in order, the spring prevents the full movement of the block **17**, or if inertia allows the movement to be completed, immediately pushes back the block far enough to break the circuit.

The modification indicated in Fig. 8 may be used when, for some reason, it is desired to locate the control box **15** on a tie end or other support outside of the rails; in this form, the rod **116** will be provided with an offset joint or connection **116A** and the portion **116B** connected to the switch point **112**, thus lowered to pass under the rail **111**.

In either, however, the operation of the control circuits is through a straight line movement of the moving parts so that no bending stresses are applied to the operating rod and all of the weather-vulnerable parts are enclosed.

I claim:

1. In railway switch circuit controls, circuit making and breaking means, a horizontally arranged cam member for actuating said means, said cam member being provided with an elongated body portion having a rectangular cross section, and being provided on its opposite vertical faces and adjacent both ends with short angularly arranged cam surface portions arranged parallel to each other, the two angular portions at each end being directly opposite each other and a cam follower member connected to the making and breaking means and coacting with both of said directly opposite angular portions.

2. In railway switch circuit controls, circuit making and breaking means, a cam member for actuating said means, said cam member being provided with an elongated body portion divided intermediate its ends and having a rectangular cross section, and being provided on two of its opposite faces and adjacent both ends with short angularly arranged cam surface portions arranged parallel to each other, the two angular portions at each end being directly opposite each other, and means for fixing the portions of said body together said fixing means including means whereby the distance from the cams at one end to those at the other may be accurately adjusted.

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