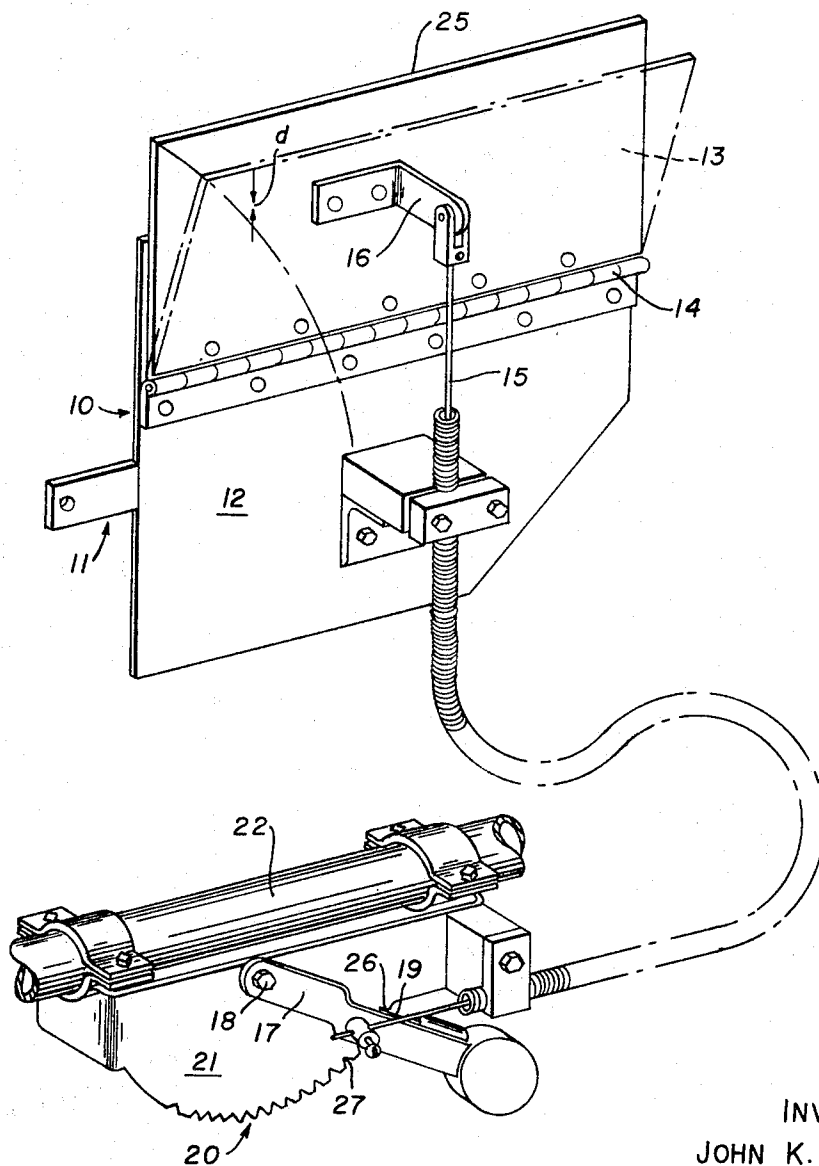


Aug. 30, 1966

J. K. STEWART
PEAKING SHADOW BOARD

3,269,017

Filed June 5, 1964



INVENTOR
JOHN K. STEWART
BY *Smart & Biggar*
ATTORNEYS

1

3,269,017

PEAKING SHADOW BOARD

John Kenneth Stewart, 60 Ballantyne Terrace,
Dorval, Quebec, Canada

Filed June 5, 1964, Ser. No. 372,825

Claims priority, application Canada, Oct. 15, 1963,
886,701

5 Claims. (Cl. 33—60)

This invention relates to a shadow device for a railroad surveying and maintenance system of the type utilizing a high frequency beam transmitter mounted for contact with the rails of the track to be surveyed, a high frequency beam receiver also on the track to receive the transmitted beam, and a shadow device between the transmitter and receiver, in contact with the track which acts as a sensor of the track condition. One example of a system of this type is described in our Canadian Patent No. 650,557, issued October 16, 1962.

As is well known, during use a railroad track surface deteriorates and usually the initial and most severe deterioration occurs at the joints between rails, which joints sag and form low points on the track.

It has long been the practice of railroads to correct the deteriorated track by periodically jacking and tamping the track particularly at the rail joints to improve the surface of the track.

I have found that I can readily jack and tamp a railroad track at rail joints, when using a high frequency beam transmitter and receiver in cooperation with a sensor shadow element and a jacking and tamping device by providing the shadow element with means whereby its height above the railroad track can be rapidly and positively adjusted.

It is an object of this invention to provide such a shadow element.

Accordingly I provide a shadow device adapter for contact with the rails of a railroad track for use in a railroad surveying system between a high frequency beam transmitter and a high frequency beam receiver, which shadow device comprises a mounting member including an extension element adapted for location substantially above a rail of the track, a beam interference member mounted on the extension element for vertical adjustment relative thereto and means for moving the beam interference member in measured increments whereby to alter the height of the beam interference member above the rails.

In a preferred construction the extension element comprises a base board to which the beam interference member is hinged by means of a piano hinge.

According to a feature of the invention the means for moving the beam interference member in measured increment comprises a push pull Bowden cable for rotating the beam interference member about the hinge, which cable is attached at one end to the beam interference member and at its other end to an operating lever which operating lever is provided with a locking device operable to lock the operating lever in a selected one of a plurality of positions whereby to position the beam interference member in a selected corresponding one of a plurality of angular positions.

The following is a description by way of example of one embodiment of the invention reference being had to the accompanying drawing which diagrammatically illustrates a shadow element having an adjustable beam interference member and means for adjusting that member.

Referring now to the drawings:

The shadow device 10 comprises an extension element 11 in usual fashion above one rail of the railroad track and in sensing contact with the surface of that rail. The shadow device 10 comprises a mounting frame 11 of any

2

suitable form, for example it may be such as described in aforementioned Canadian Patent No. 650,557, to which is attached an extension element 12. In the embodiment shown the element 12 is in the form of a base board, which extends outwardly of the mounting frame 11 above a rail of the track between a high frequency beam transmitter and a high frequency beam receiver of known type mounted in known fashion. Suitably a similar arrangement may be provided for the other rail of the track. A beam interference member 13 is mounted for vertical adjustment relative to the base board in the embodiment shown, is hinged by normal piano hinge 14 to the base board and is moved in measured movements by being rotated about its hinge 14 by means of a push pull Bowden cable 15 attached by means of a clevice to the bracket 16 on the beam interference member 13 and on the other hand to the lever 17. The lever 17 is pivotally mounted on pivot pin 18 and is capable of rotation about pin 18 to take up a position with its spring loaded ratchet engaging pin 19 in positive locking engagement with one of the notches 20 of a quadrant 21 which may suitably be attached to a part of the frame 22 of a tamping vehicle located immediately adjacent the mounting frame 11.

In operating with an infrared beam transmitter and receiver, when the transmitter, the edge 25 of the interference member 13, and the infrared beam receiver are all at the same height above the rail a "zero" condition exists. Now assuming that the transmitter and the receiver are maintained at a fixed height above the track the rotation of the beam interference member 13 about the piano hinge 14 causes an alteration of the height of the edge 25 of the beam interference member 13, above the railroad track. Thus by moving the lever 17 from engagement with the notch 26 to locking engagement with, say, the notch 27, the edge 25 is caused to be lowered by a height "d" and thus the receiver will see the transmitted beam until the beam interference member 13 is again adjusted to the "zero" position. This would normally be done by operating a jacking element associated with the shadow device automatically on beam reception by the receiver, which would lift the rail and with it the mounting frame 11 and the interference member by the distance "d" until the "zero" point was again reached, the beam receiver once more was shadowed from the transmitter, and the jacking stopped.

Clearly now as the shadow device proceeds along the track and the mounting frame 11 is located over a rail joint, and provided that the beam interference member is at its maximum height (or straight up) no action to jack and raise the rail at the joint will occur unless the joint is low. If the joint is low it will be automatically jacked by the appropriate amount until the edge 25 reaches the "zero" position in which it is at the same height above the track as transmitter and receiver and the transmitter beam is thereby shadowed from the receiver.

If it is desired, as it so very often is, not just to elevate the joint to the desired height but rather to elevate it slightly more and in effect "peak" the joint, this can be achieved by rotating the beam interference member 13 about its hinge 14 by the appropriate distance so that the distance "d" will correspond with the desired amount of peaking.

The notches 20 are calibrated so that the movement around the quadrant (which is angular) will be translated into accurate elements of linear vertical distance "d."

Although the interference member 13 has been shown as hinged to the board 12 it is to be understood that any suitable mechanism for vertically altering the height of the edge 25 could be used for example the member 13 could be arranged for up and down movement in an extension member formed of vertical guides.

As has been indicated, for rail joint leveling or peaking, a pair of extension elements are arranged one over each rail. Separate remote control levers 17 are provided on the jacking and tamping vehicle so that the vehicle operator can jack the rail joints of both rails of the track.

For the sake of simplicity, reference has been made hereinbefore to the height of the edge 25 above the rail being the same as the height of the transmitter and the height of the receiver for a "zero" condition but since certain surveying systems work on the quantity of received light rather than an actual reference line of light, it is to be understood that the edge 25 may sometimes be lower or higher than the height of the transmitter and the receiver and have a "zero" condition occurring. That is to say, the edge 25 and the transmitter and receiver need not be on a geometrically straight line but there will always be an established relationship between the height of the transmitter above the track, the height of the receiver above the track and the height of the edge 25 above the track for a "zero" condition.

What I claim as my invention is:

1. A shadow device adapted for contact with the rails of a railroad track for use in a railroad surveying system between a high frequency beam transmitter and a high frequency beam receiver, which shadow device comprises a mounting member including a board-like extension element adapted for location substantially above a rail of the track, a beam interference member hingedly mounted by a piano hinge to the extension element for vertical adjustment relative thereto and means for moving the beam interference member in measured increments whereby to alter the height of the beam interference member the rails.

2. A device as claimed in claim 1 in which the means for moving the beam interference member in measured increment comprises a push-pull Bowden cable for rotating the beam interference member about the hinge, which cable is attached at one end to the beam interference member and at its other end to an operating lever which operating lever is provided with a locking device operable to lock the operating lever in a selected one of a plurality of positions whereby to position the

beam interference member in a selected corresponding one of a plurality of angular positions.

3. A device for use in a railroad surveying system between a high frequency beam receiver and a high frequency beam transmitter with a jacking and tamping vehicle for contact with the rails of a railroad track, comprising an extension element mounted on each side of the jacking and tamping vehicle above each rail of the track, a beam interference member mounted on each extension element, each said beam interference member having a top edge, means mounting each of said interference members on the extension elements for selective linear vertical adjustment of their top edges relative thereto, and remote control means on the jacking and tamping vehicle for selectively moving each of the beam interference members in measured increments to alter the height of the top edges of the beam interference members above the rails of the track.

4. A shadow device as claimed in claim 3 in which the extension elements comprise base boards and the beam interference members are hinged by means of a piano hinge.

5. A device as claimed in claim 4 in which the means for moving the beam interference members in measured increments comprise push pull Bowden cables connected at one end to the beam interference members and at the other end to the remote control levers on the vehicle, means being provided for locking the remote control levers in a selected one of a plurality of positions whereby to position the beam interference members in a selected corresponding one of a plurality of angular positions.

References Cited by the Examiner

UNITED STATES PATENTS

1,793,926	2/1931	Green	74—501
2,093,049	9/1937	Leavitt	33—46
2,652,245	9/1953	Bentley	74—501 X
2,657,465	11/1953	Lloyd	33—50

LOUIS R. PRINCE, *Primary Examiner*.

ISAAC LISANN, D. MCGIEHAN, *Assistant Examiners*.