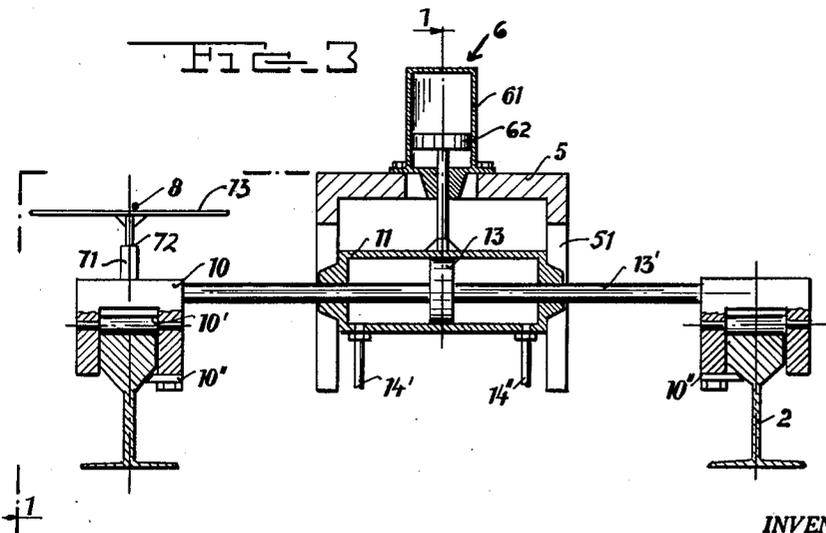
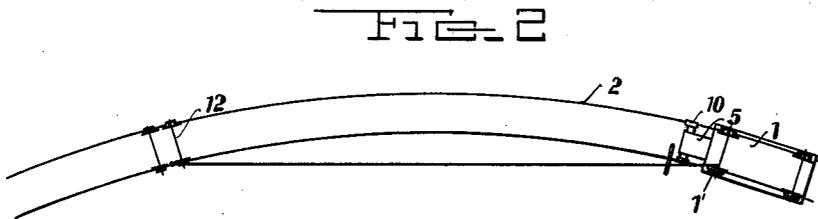
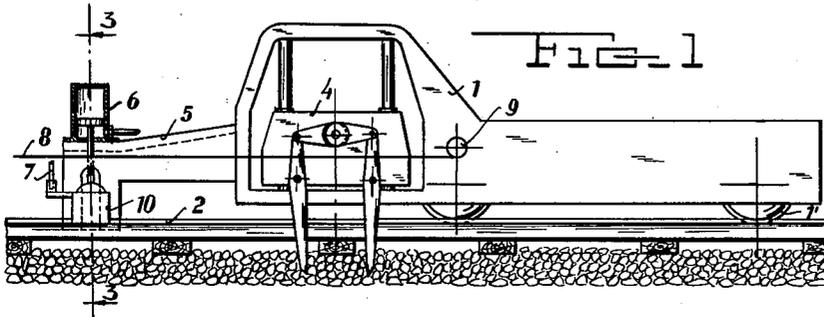


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TRACK ALIGNING APPARATUS

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TRACK ALIGNING APPARATUS
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This invention relates to apparatus for adjusting the position of railroad tracks, and is more particularly concerned with apparatus for aligning the tracks with a predetermined reference line.

An important object of the invention is the provision of an apparatus capable of adjusting not only the vertical but also the horizontal position of tracks transversely of the usual direction of vehicle movement.

Another object is the provision of such apparatus the operation of which may readily be controlled by reference to a fixed line.

A known type of track aligning apparatus includes a carriage equipped with wheels for movement along the track to be aligned. The front end of the known apparatus is equipped with track lifting devices for vertical adjustment of a track portion just ahead of the wheels. The present invention, in its more specific aspects, combines the known arrangement with means for transversely moving the tracks while in the lifted condition. The apparatus may additionally include track tamping means for securing the tracks in their adjusted position.

Simultaneous vertical and horizontal alignment of the tracks not only saves time and effort, as compared to separately operating lifting devices and transverse shifting devices, but it has been found that the force required to shift a track section laterally is substantially reduced by lifting the track and laterally shifting it while at least partially raised from the underlying ballast.

Index means for determining the spatial relationship between the track section which is being aligned and a reference line are preferably also mounted on the forward portion of the carriage in vertical alignment with the working range of the track lifting and track shifting devices.

Other features and many of the attendant advantages of this invention will be more readily understood from the following detailed description of a preferred embodiment thereof when taken in conjunction with the accompanying drawing in which the same reference numerals indicate identical elements in the several figures thereof, and in which:

FIG. 1 is a side elevational view of a preferred embodiment of the track aligning apparatus of the invention, in position on a section of track;

FIG. 2 shows the apparatus of FIG. 1 in a somewhat schematic plan view on a reduced scale; and

FIG. 3 is a front elevational sectional view of the apparatus of FIG. 1, taken on the line III—III on an enlarged scale.

Referring now to the drawing in detail, and initially to FIG. 1, there is seen the carriage frame 1 of a track aligning machine mounted on two sets of wheels 1' arranged on the rear portion of the frame 1. The direction of movement of the machine during normal operation is from the right toward the left, as viewed in FIG. 1, that is, in the direction of the longitudinal machine axis.

The wheels 1' rest on track 2. The track section under the rear portion of the machine has been previously aligned and the machine is in position for alignment work on the track section underlying the front portion 5, which may include raising the track 2 with ties 3, and then tamping ballast under the raised ties.

A conventional vibratory ballast tamping device 4, for instance of the type disclosed in United States Patent 2,876,709, is mounted just ahead of the front wheels. A

hydraulic jack 6 is arranged forwardly of the tamping device 4. As better seen in FIG. 3, the jack 6 includes a hydraulic cylinder 61 mounted on the front portion 5 of the carriage frame 1. A piston 62 is vertically slidable in the cylinder 61 under the pressure of hydraulic fluid admitted to the cylinder from a hydraulic circuit, not illustrated, in which a pump forces fluid under pressure alternatively into the cylinder chambers above and below the piston 62. The circuit will be understood to include customary valves for connecting the pump to one of the cylinder chambers while venting the other space to a sump from which the fluid is returned to the circuit by the pump.

The piston 62 carries a cylinder 11 the axis of which is horizontal. The cylinder 11 moves with the piston 62 in a vertical direction and is guided in slots 51 of the frame portion 5. A piston 13 horizontally moves in the cylinder 11 and divides the cylinder space into two chambers which respectively communicate with the afore-mentioned pump (not shown) by conduits 14' and 14". It will be understood that suitable control valves (not shown) are arranged in the conduits 14' and 14" to control the movement of the piston 13.

The piston rod 13' of the piston 13 projects from both ends of the cylinder 11 laterally of the direction of carriage movement. The free ends of the piston rod 13' each carry a heavy gripping claw 10 of approximately U-shaped cross section which fits over the head of each rail of the track 2. A roller 10' is mounted on the inside of the claw 10. It is rotatable about a horizontal axis and permits the claw to move along the track over a limited distance when the position of the carriage frame 1 is shifted. A latch member 10" is pivotal on a free edge of the claw 10 into engagement with the underside of the head of the rails, thus preventing the rail heads from slipping out of the claw.

An adjustable index element 7 is mounted on the left claw 10, as seen in the direction of normal carriage movement. It has two vertically telescoping members 71 and 72. The tubular member 71 is fixedly fastened to the claw 10. The height of the rod member 72 can be adjusted in the member 71 and the overall height of the device may then be secured by a set screw in the tubular member 71 (not shown). The rod member 72 carries a cross piece 73 which normally extends transversely of the direction of carriage movement and may be provided with longitudinal gradation marks if so desired. The rod member 72 may equally be provided with marks to indicate the overall height of the device. With the rod member 72 clamped in the tubular member 71 and the roller 10' in contact with the head of the track 2, the distance between the cross piece 73 and the track head is fixed and can be read from the marks on the rod member 72. Reverting to FIG. 1, there is seen a pulley 9 to which one end of a wire 8 is fastened. The wire is held in tension by a spring (not shown) which tends to rotate the pulley 9 in a counterclockwise direction as viewed in FIG. 1. The pulley 9 is vertically aligned with the front wheels 1' of the carriage and thus at a fixed distance from the top surface of a previously aligned portion of the track 2.

FIG. 2 shows in a plan view on a reduced scale how the wire 8 provides a reference line for track alignment by the apparatus of FIG. 1. A small car 12 is stationary on the track 2 ahead of the aligning apparatus in such a manner that the distance from the cross piece 73 to the pulley 9 is but a small fraction of the distance between the cross piece and the car 12. The free end of the wire 8 is mounted on the car 12 at the same height as the face of the pulley 9 tangentially engaged by the other end portion of the wire. Although the car 12 stands on a portion of the track 2 the position of which has not yet been

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adjusted, the wire 8 gives an accurate reference line representative of the proper location of the track under the cross piece 73. As best seen in FIG. 3, this reference line may deviate from the center of the cross piece 73. This deviation is a measure of the necessary vertical and/or lateral movement of the track 2.

The apparatus described operates as follows:

The relative position of the wire 8 and the marks on the cross piece 73 and the rod member 72 provide guidance to the operator of the machine for the required adjustment of the track 2. He admits pressure fluid to the cylinders 61 and 11, as required, so as to shift both rails in a vertical and a horizontal direction. With the track still held in the claws 10, the carriage frame 1 is advanced by the distance between two adjacent ties and the track is secured in the adjusted position by tamping ballast under the tie adjacent the freshly aligned track section. The aligning operation may then be repeated on the next track section.

It will be understood that the foregoing disclosure relates to a preferred embodiment of the invention and that it is intended to cover all changes and modifications of the example of the invention herein chosen for the purpose of the disclosure which do not constitute departures from the spirit and scope of the invention set forth in the appended claims.

We claim:

1. A track aligning apparatus comprising, in combination:

- (a) a vehicle frame having an axis extending in the normal direction of vehicle frame movement along the track, and having axially spaced front and rear portions;
- (b) two pairs of wheels for supporting said rear portion on track rails, the front portion of the frame

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freely projecting from the supported rear portion in said normal direction;

- (c) track tamping means mounted on said front portion;
- (d) rail gripping means mounted on said front portion;
- (e) first actuating means for moving said rail gripping means on said front portion in a horizontally extending direction transversely in relation to said axis;
- (f) second actuating means for moving said rail gripping means on said front portion in a vertically extending direction;
- (g) means defining a line of reference extending along said forward portion and passing through a point fixed with respect to said rear portion; and
- (h) index means in fixed spatial relationship to the gripping means for indicating the position of the gripping means in respect to the reference line in said vertically and horizontally extending direction.
2. An apparatus as set forth in claim 1, wherein said track tamping means are axially interposed between said rail gripping means and said rear portion.

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