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TRACK RECORDER SYSTEM

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1,980,706

TRACK RECORDER SYSTEM

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ber 31, 1931, Serial No. 584,044

12 Claims. (Cl. 234—1)

This invention relates to track recorder systems adapted to give a permanent record of those characteristics of railroad tracks which are of importance in obtaining maximum smoothness and speed of operation of vehicles traveling thereover. This invention has for its object to obtain permanent records of such characteristics under normal operating conditions, that is, the characteristics of the tracks while a vehicle is traveling over them so that the full gravity and tangential pressures are operating on the tracks.

More particularly, this invention relates to a means for making a continuous record of variations in the track gauge for the purpose of determining the distance between the rails to reveal spreading or narrowing thereof. This application is a division of co-pending application Serial No. 690,930 filed February 6, 1924, for Track recorder systems.

A further object of this invention is to provide in a track gauge mechanism means for distinguishing between the side to side lunge of the car and actual variations in track gauge.

A further object of this invention is the provision of means permitting movement of the track gauge members to effective and ineffective positions and for insuring engagement of said members with the inner surfaces of the rail heads when lowered to effective position.

A further object of this invention is the provision of a record chart movable relative to the record means at a rate which is a constant function of the car speed and hence of the distance travelled, so that not only the degree of track variations will be plotted, but also the position of rails in which said variations are present.

Other objects and advantages of this invention will become apparent in the following detailed description thereof.

In the accompanying drawing,

Fig. 1 is a plan view, largely diagrammatic, of the track gauge mechanism shown in assembly.

Fig. 2 is an enlargement of a detail of the Fig. 1 device.

Fig. 3 is a front elevation, partly sectioned vertically, of another portion of the track gauge device, including parts not shown in Fig. 1.

There is provided upon the chart 10 a permanent record of variations in the track gauge. Said chart may be driven from the car axle in any suitable manner, as shown, for instance, in the parent application Ser. No. 690,930. For this purpose, there is provided a pair of arms 120 shown in plan in Fig. 1 and in elevation in Fig. 3. Each arm is pivoted intermediate its length at 121 on a link

122 pivotally connected at 123 to the car truck frame F. The lower end of each arm or lever 120 is provided with a shoe of hardened steel adapted to engage the inside flange of the rail. Cables 126, 127, are connected to the upper end of the respective levers 120 and pass around pulleys 128, 129, to the opposite ends of an evenner bar 130 pivoted on one end of a rack bar 131 normally held spring-pressed by a spring 132 in such direction as to hold the shoes 125 pressed against the inner flanges of the rails. It is obvious that if one or the other, or both, shoes 125 should move inwardly due to narrowing of the track gauge, the rack 131 would be operated against the action of spring 132 to actuate a transmitter 140 in one direction through suitable gearing shown more in detail in Fig. 2. Similarly widening of the track gauge would permit spring 132 to draw the rack in the opposite direction and actuate said transmitter in the opposite direction. The transmitter is electrically connected to a recording pen 135 through means such as repeater motor 140' driving a roller 90 having a cam slot in which said pen arm 134 operates. Side thrust of the truck without widening or narrowing of the rails will merely rock the evenner bar 130 without affecting rack 131, since cable 126 will act oppositely to cable 127 and to the same degree.

It is sometimes necessary to raise the car off the tracks in which case the shoes 125 would swing outwardly to a degree which would render it difficult to bring said shoes again into engagement with the inner rail flanges. Other occasions such as in switch yards may arise when it is desired to render the track gauge recorder equipment inactive. Means are provided for this purpose in the form of a link 141 fixed to each link 122 and connected to a beam 142. Obviously, raising of beam 142 will raise shoes 125 out of engagement with the rails and a fixed stop 143 prevents outward movement of said shoes. Beam 142 is normally pressed toward the ineffective position by a pair of balanced springs 145 fixed at one end and connected at the other ends to the beam. To lower the beam and shoes to effective position, the beam is connected centrally to the piston 146 of a cylinder 147 controlled by some fluid under pressure, such as steam or compressed air, supplied by a pipe 148 and controlled from the interior of the car. Turning on the supply of fluid pressure will, therefore, depress piston 146 and beam 142 and render the track gauge recorder device effective, while removing the pressure permits the springs 145 to render the equipment inactive. In lowering the shoes the cams 150' 110

guide them inwardly over the end of stops 143 so as to insure their engaging the inner flanges of the rails. When clear down, the levers 120 are free from the guiding effect of this cam.

- 5 It may occur that in passing over the break in the rail caused by an "end on" open frog, or by some defect or other structure of the rails, that one shoe 125 will move outwardly to such distance as to pass down the branch track or otherwise so that it will not again engage the inside rail flange after it has passed over the break. For this purpose the shoes are provided with up-turned ends 149, and further, with retarding means which after the shoes 125 have moved outwardly a predetermined distance will become operative to retard the outward movement. The structure employed is purely illustrative as shown in Fig. 2, and is contained preferably within transmitter box 140. The rack 131 is shown as actuating a pinion 150 on the transmitter shaft so that said transmitter will be responsive to the movements of rack 131. Fixed upon the same shaft with pinion 150 is a ratchet 151 with which engages a pawl 152 on a gear 153 which meshes with a pinion 154 on the same shaft with which is mounted an escapement wheel 155 with which cooperates an escapement pawl 156. Pawl 152 is normally pressed by a guided or constrained spring 158 toward the end 159 of an arcuate slot 160. As the pinion 150 and ratchet 151 rotate, however, due to movement of the rack in the direction of the arrow, pawl 152 is forced to the opposite end of the slot, the gear 153 being inactive throughout this period. Further movement of ratchet 151 in the same direction will cause gear 153 to rotate together with pawl 152 to actuate the escapement which limits the speed of movement of the entire system and hence of rack 131 when the shoes are moving outwardly. For a predetermined degree of movement of the shoes, (i. e., until pawl 152 has been operated to the other end of the slot), the transmitter can be operated at any speed to respond quickly to changes in track gauge; beyond these limits the escapement becomes effective to retard the speed of outward movement of the rack 131 (and hence of the shoes) to prevent movement of the shoes within a safe distance of the point where ends 149 are no longer effective and it is difficult for the shoes to re-engage the inner flanges of the tracks. If desired, the retarding means may be rendered effective upon any outward movement of the shoes, this being accomplished merely by eliminating the slot 160 and fixing pivot 159 upon gear 153.

In accordance with the provisions of the patent statutes, there is herein described the principle and operation of this invention, together with the apparatus which is now considered to represent the best embodiment thereof, but it is understood that the apparatus shown is only illustrative and that the invention can be carried out by other means. Also, while it is designed to use the various features and elements in the combination and relations described, some of these may be altered and others omitted without interfering with the more general results outlined, and the invention extends to such use.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. In a track gauge recorder carried by a railroad car, gauge members adapted to engage the respective rails, a recorder, and a connection between said gauge members and said recorder whereby movements of said gauge members rela-

tive to each other actuate said recorder, said connection having means whereby said recorder is unaffected by equal movements of said gauge members in the same direction.

2. In a track gauge recorder carried by a railroad car, gauge members adapted to engage the respective rails, a recorder, and a connection between said gauge members and said recorder whereby movements of said gauge members relative to each other actuate said recorder, said connection including a pivoted member whose ends are connected to the respective gauge members whereby said recorder is unaffected by equal movements of said gauge members in the same direction.

3. In a track gauge recorder carried by a railroad car, gauge members adapted to engage the respective rails, a recorder, and a connection between said gauge members and said recorder, said connection including a rack movable linearly to actuate said recorder and a beam pivoted on said rack, the arms of said beam being connected to said respective gauge members whereby movements of said gauge members relative to each other cause movement of said rack to actuate said recorder but equal movements of said gauge members in the same direction affect only said beam to turn the same about its pivot.

4. In a track-recorder for a railroad car, means responsive to variations in track gauge comprising a pair of members adapted to engage the respective rails of the track, and means whereby variations in the distance between said members cause operation of said recorder, said last-named means including an electric transmitter, an operating member therefor, and means whereby variations in the distance between said members actuate said operating member.

5. In a track-recorder for a railroad car, means responsive to variations in track gauge comprising a pair of members adapted to engage the respective rails of the track, and means whereby variations in the distance between said members cause operation of said recorder and whereby equal movements of said members in the same direction do not affect the recorder, said last-named means including an electric transmitter, means for operating said transmitter including a rack, a beam pivoted on said rack, said members being connected to opposite ends of said beam.

6. In a track-recorder for a railroad car, means responsive to variations in track gauge comprising a pair of members adapted to engage the respective rails of the track, means whereby variations in the distance between said members cause operation of said recorder, and means for retarding the rate of outward movement of said members after a pre-determined degree of outward movement.

7. In a track-recorder for a railroad car, means responsive to variations in track gauge comprising a pair of members adapted to engage the respective rails of the track, means whereby variations in the distance between said members cause operation of said recorder, means permitting relatively rapid outward movement of said members up to a pre-determined degree of said movement, and means for retarding the rate of outward movement thereafter.

8. In a track-recorder for a railroad car, means responsive to variations in track gauge comprising a pair of members adapted to engage the respective tracks, means whereby variations in the distance between said members cause operation of said recorder, means permitting rela-

tively rapid outward movement of said members up to a pre-determined degree of said movement, and an escapement rendered effective thereafter for retarding the outward movement.

5 9. In a track-recorder for a railroad car, means responsive to variations in track gauge comprising a pair of members adapted to engage the respective rails of the track, means whereby variations in the distance between said members
10 cause operation of said recorder, and an escapement for retarding the outward movement of said members.

10. In a track-recorder for a railroad car, means responsive to variations in track gauge
15 comprising a pair of members adapted to engage the respective rails of the track, means whereby variations in the distance between said members cause operation of said recorder, an
20 escapement for retarding the outward movement of said members, and a lost-motion connection between said members and said escapement whereby said members are permitted to move
outwardly at a relatively rapid rate up to a pre-determined degree of outward movement.

25 11. A track-recorder for a railroad car having means responsive to variations in track gauge

comprising a pair of members adapted to engage the respective rails of the track and means whereby said first means actuates said recorder, means interconnecting said members whereby
80 said members may be moved simultaneously to effective position in engagement with the rails or to ineffective position out of engagement therewith, and a single means connected to said
85 interconnecting means for moving said member to effective and ineffective positions.

12. A track-recorder for a railroad car having means responsive to variations in track gauge comprising a pair of members normally pressed
outwardly into engagement with the respective
90 rails of the track and means whereby variations in the distance between said members cause operation of said recorder, a single means whereby
said members are moved simultaneously to effective position in engagement with the rails or
95 to ineffective position out of engagement therewith, and means for preventing outward movement of said members when in ineffective position.

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Executor of Estate of Elmer A. Sperry, De-
ceased. 100

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