

(No Model.)

P. C. COMPTON.

AUTOMATIC RAILWAY TRACK INSPECTOR.

No. 331,684.

Patented Dec. 1, 1885.

Fig. 2

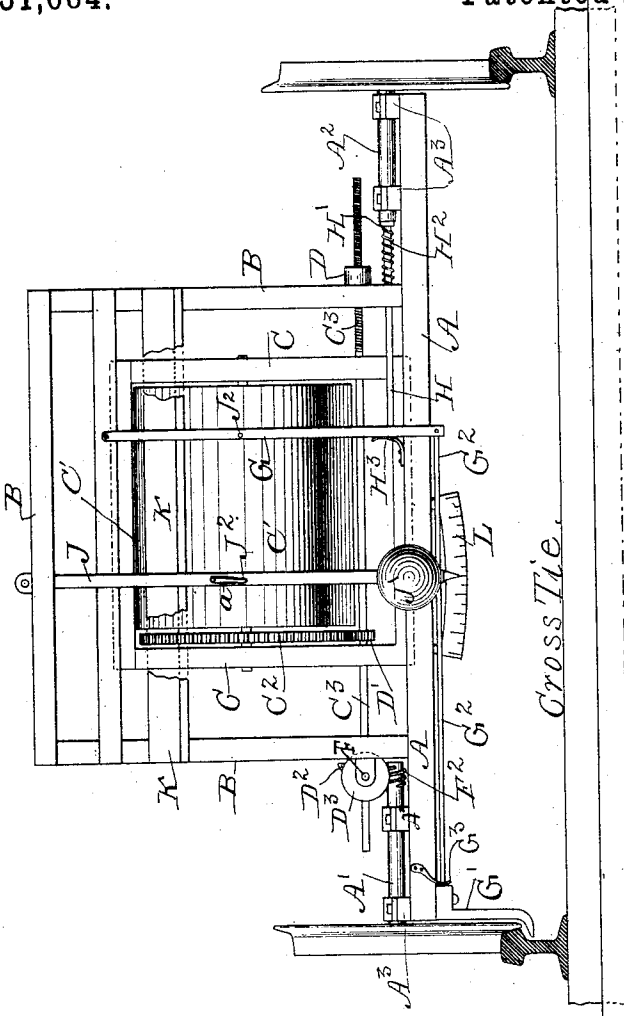


Fig. 1

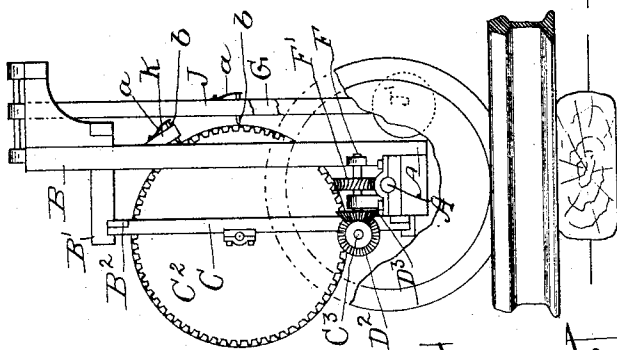


Fig. 3



Fig. 4



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UNITED STATES PATENT OFFICE.

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AUTOMATIC RAILWAY-TRACK INSPECTOR.

SPECIFICATION forming part of Letters Patent No. 331,684, dated December 1, 1885.

Application filed December 15, 1884. Serial No. 150,340. (No model.)

To all whom it may concern:

Be it known that I, PORTER C. COMPTON, a citizen of the United States of America, and a resident of Ames, in the county of Story and State of Iowa, have invented an Automatic Railway-Track Inspector and Notator, of which the following is a specification.

My object is to facilitate the discovery of irregularities in the top surface of a railway-track, and also irregularities of gage or lateral deflections that require attention to secure safety to passing trains.

My invention consists in the construction and combination of a machine with a car, as hereinafter fully set forth, pointed out in the claims, and illustrated in the accompanying drawings, in which—

Figure 1 is an end view, and Fig. 2 a view of the rear side, of my machine in position as required for practical use. Fig. 3 is a fac-simile of the tracing made by the machine to note and reveal the vertical irregularities and defects in the level of a track, and Fig. 4 is a fac-simile of the lateral deflections and irregularities of gage detected and noted by the machine at the same time.

Jointly considered, these figures clearly illustrate the construction, application, operation, and utility of my invention.

A represents an oblong frame that corresponds in length with the gage of the track upon which my machine is to be used.

A¹ and A² are carriage-axles mounted in bearings A³, fixed on top and near the ends of the frame A. Flanged wheels adapted to run on the track are fixed to the ends of the revolving axles to produce a carriage adapted to carry my operative mechanism, and also adapted to be attached to a car to be thereby advanced over a track.

B is a rectangular frame fixed on the top of the frame A to extend vertically.

B¹ are bearers fixed to the top portions of the ends of the frame A to support a sliding frame, C.

B² are cross-pieces fixed to the free ends of the bearers to guide the sliding frame.

C is a sliding frame supported in a vertical position by the bearers B¹.

C¹ is a revolving cylinder mounted in bearings fixed to the ends of the sliding frame.

C² is a gear-wheel fixed to the axle of the cylinder.

C³ is a driving-shaft that has its bearings fixed to the ends of the sliding frame. One of its ends is screw-threaded, and extends through a nut, D, that is fixed to the frame B.

D¹ is a pinion fixed to the shaft C³ to engage the gear-wheel C², and thereby rotate the cylinder.

D² is a bevel gear-wheel feathered to the shaft C³ in such a manner that when the wheel is rotated it will revolve the shaft, and also allow it to slide longitudinally.

F is a shaft in bearings fixed to the frame A. It has a bevel gear-wheel, D³, fixed to its end to engage the wheel D².

F¹ is a worm-wheel fixed to the center of the shaft F.

F² is a worm formed on or fixed to the end of the carriage-axle A¹ to engage the wheel F¹, as required to transmit rotary motion to the shaft E, and from thence to the shaft C³ by means of the wheels D² and D³, and the cylinder C¹ by means of the pinion D¹ and the gear-wheel C².

G is a rigid bar and pencil carrier pivoted to and suspended from a cross-piece at the top portion of the frame B.

G¹ is an elbow-shaped lever pivoted to the under side of the frame A in such a manner that the vertical portion of the lever will extend down at the side of the wheel fixed to the axle A¹ and terminate under the ball of the rail, and the horizontal portion of the same lever is connected with the lower end of the pendent pencil-carrier G by means of a rod, G².

G³ is a spring that presses the end of the lever toward the web of the rail.

H is a sliding rod extending from the inner end of the axle A², and terminating against the suspended pencil-carrier G. It passes through a bearing fixed to the frame B, and has a collar or shoulder, H¹, that retains a spring, H², that is coiled around the rod between the collar and the stationary frame B. This spring keeps the end of the rod in contact with the end of the axle A².

H³ is a spring fixed to the frame A in such a manner that it will keep the suspended pencil-carrier in contact with the inner end of the sliding rod H.

J is the rod, and J' the bob, of a pendulum pencil-carrier suspended from the top of the frame B in such a manner that it will be in parallel position with the pencil-carrier G. Each of these pencil-carriers has perforations J², or pencil-holding devices, through which pencils are extended toward the cylinder C', and retained in contact with paper C¹ on the surface of the cylinder by means of sensitive springs a, that will cause the pencil b to trace lines upon the paper as the cylinder revolves. When the pencil carriers are in a perpendicular position, the lines traced by their pencils will be straight, and when they are not perpendicular the lines traced will vary from a straight line.

K is a bar and pencil holder fixed to the ends of the frame B in such a manner that pencils fastened thereto will engage the paper on the surface of the cylinder, and trace straight lines thereon relative to the irregular lines traced by the pencils carried by the suspended carriers G and J.

L represents a scale, fixed to the frame A, to indicate when the machine and track are level.

In the practical use of my machine, thus constructed to correspond in width with the gage of the track upon which it is to be operated, I wrap a sheet of paper around the cylinder in such a manner that the four pencils (one in the suspended carrier G, one in the rod J, and two in the fixed bar K) that come in contact therewith will slide smoothly over the paper as the cylinder is revolved. I then move the sliding frame C and cylinder carried thereby to the side of the fixed frame B before advancing the machine on the track, so that when the machine is advanced the worm F² on the axle A' will, through the medium of the worm-wheel F', shaft F, and bevel gear-wheels D² and D³, rotate the shaft C². As the shaft C² is operated it will advance in the nut D and move the sliding frame and cylinder along, and at the same time, by means of the fixed pinion D' and the gear-wheel C², (which pinion and wheel remain in mesh as the drum C and shaft C² slide jointly,) rotate the cylinder, and thereby cause the four pencils to trace lines spirally upon the paper carried by the revolving and sliding cylinder.

When the track traversed is not level, the pendulum pencil-carrier J will swing laterally, and the pencil therein will trace an irregular line to note the variation of level, as shown in Fig. 3.

When the gage is irregular, the carriage-axle A² will slide in its bearings, and by means of the rod H move the suspended pencil-carrier G laterally, so that the pencil carried thereby will note the irregularity of gage in the track, as shown in Fig. 4.

When the lower bent end of the pivoted lever G' comes in contact with a fish-plate at a joint, it will, in sliding over the plate, vibrate sufficiently to press the pencil-carrier G in the opposite direction and cause the pencil to mark each joint in the track, as

clearly shown in the diagram Fig. 4. The pencils thus successively moved in opposite directions relative to the straight lines traced by the pencils held at fixed points in the bar K will trace irregular lines, corresponding with the variations in the level of the track and the gage of the track, and thus detect and record any defects that may exist in the track.

The straight lines in the diagrams, made simultaneously by the pencils b in the fixed bar K, with the irregular lines, made by the pencils carried in the vibrating carriers G and J, may be considered the datum lines, so that the space between an irregular line and its corresponding straight line will be a true index of the level, and also of the gage of a track.

I prefer to make the machine so that the actual variations in the irregular lines traced upon the paper will be one-fourth the actual variations in the level of the track and one-half in that of the gage.

I am aware that a rotating axle in a track-inspector has had longitudinal play relative to the track-rails upon which the machine was operated, and that a horizontal frame and vertical frame have been combined to produce a carriage adapted to carry track inspecting and recording mechanisms; but my manner of constructing a carriage and combining a sliding frame and track inspecting and recording devices with the carriage-frame is novel and advantageous.

I claim as my invention—

1. In a railway-track-inspecting machine, a carriage composed of a horizontal frame having fixed axle-bearings at its opposite ends, one axle being fixed to a traction-wheel, and provided with a worm on its end adapted to transmit rotary motion, a rotating shaft that slides in bearings fixed to the frame, gearing to transmit motion from the worm to said sliding shaft, and one axle fixed to a traction-wheel in such a manner that the axle and wheel can rotate and also slide laterally relative to the variations in the gage of a track.

2. A carriage having one of its axles provided with a worm at its inner end, and one of its axles provided with springs adapted to slide it longitudinally and in reverse ways, a vertical frame fixed on top of the horizontal carriage-frame, a rotating and sliding shaft, gearing to transmit motion from the worm on the rotating axle to said sliding shaft, pencil-carriers suspended on the vertical frame, and a sliding frame carrying a rotating cylinder, arranged and combined to operate in the manner set forth, for the purposes specified.

3. A carriage-frame, A B, having a worm on the end of one of its axles, a sliding frame, C, carrying a cylinder having a gear-wheel on its axle, a shaft having a bevel gear-wheel feathered to one of its ends and a screw-threaded section at its opposite end extended through a fixed nut, D, and a pinion fixed to its intermediate portion, and a short shaft, F, having

a fixed worm-wheel, F' , and a fixed bevel gear-wheel, D^3 , arranged and combined to operate in the manner set forth, for the purposes stated.

5 4. The combination of a suspended pencil-carrier, G , with a carriage having a stationary pencil-holder, K , a sliding frame carrying a rotating cylinder, a sliding axle, A^2 , a sliding rod, H , and springs H^2 and H^3 , to operate
10 in the manner set forth, for the purposes specified.

5 5. The combination of a suspended pencil-carrier, G , with a carriage having a stationary pencil-holder, K , a sliding frame carrying
15 a rotating cylinder, a sliding axle, A^2 , a sliding rod, H , an elbow-shaped lever, G' , and a connecting-rod, G^2 , to operate in the manner set forth, for the purposes specified.

20 6. An automatic railway-track inspector and notator, composed of the following elements, to wit: a carriage consisting of a hori-

zontal frame having a vertical frame fixed on its top, a revolving axle provided with a worm at its inner end and a flanged traction-wheel at its outer end, a revolving axle adapted to
25 slide longitudinally in its bearings and having a flanged traction-wheel at its outer end, a sliding frame carrying a revolving cylinder and a gear-wheel, a rotating and sliding shaft carrying a pinion, mechanism to transmit mo-
30 tion from the rotating carriage-axle to the rotating shaft, a sliding frame and a rotating cylinder, a fixed bar and pencil-holder, a pendent pencil-carrier having a bob on its end, a
35 pendent pencil-carrier having pressing devices on the opposite sides of its lower end, substantially as set forth.

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