

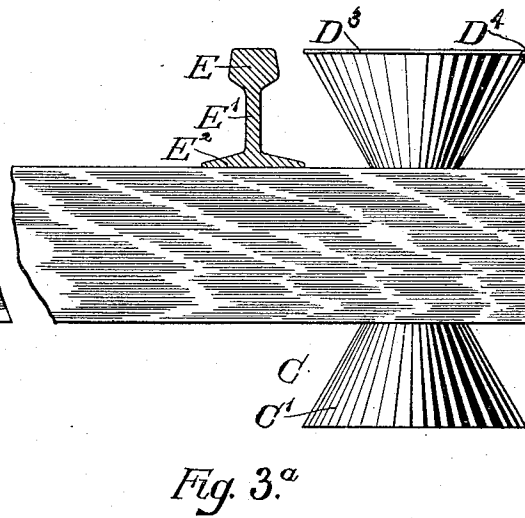
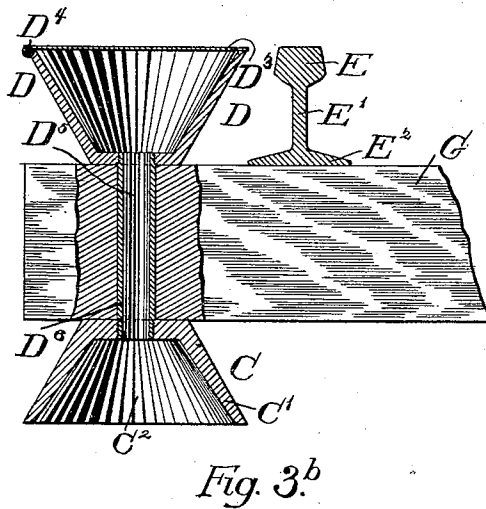
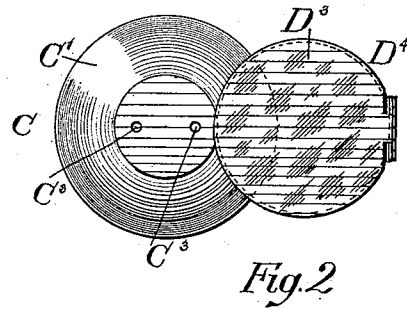
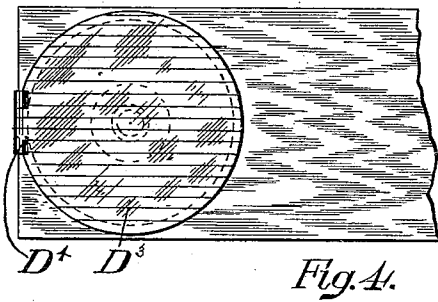
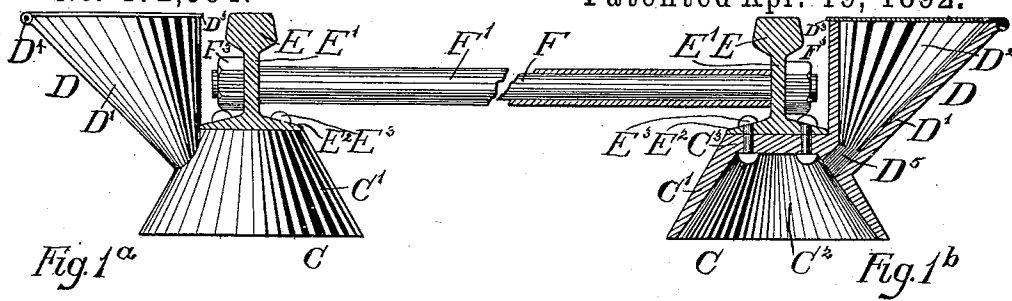
(No Model.)

2 Sheets—Sheet 1.

B. HALSTEAD.
AUTOMATIC BALLASTING DEVICE.

No. 472,994.

Patented Apr. 19, 1892.



Attest:
Henry Appleton
H. Smith.

Inventor:
Benton Halstead
per Wm. Hubbell Fisher
Attorney:

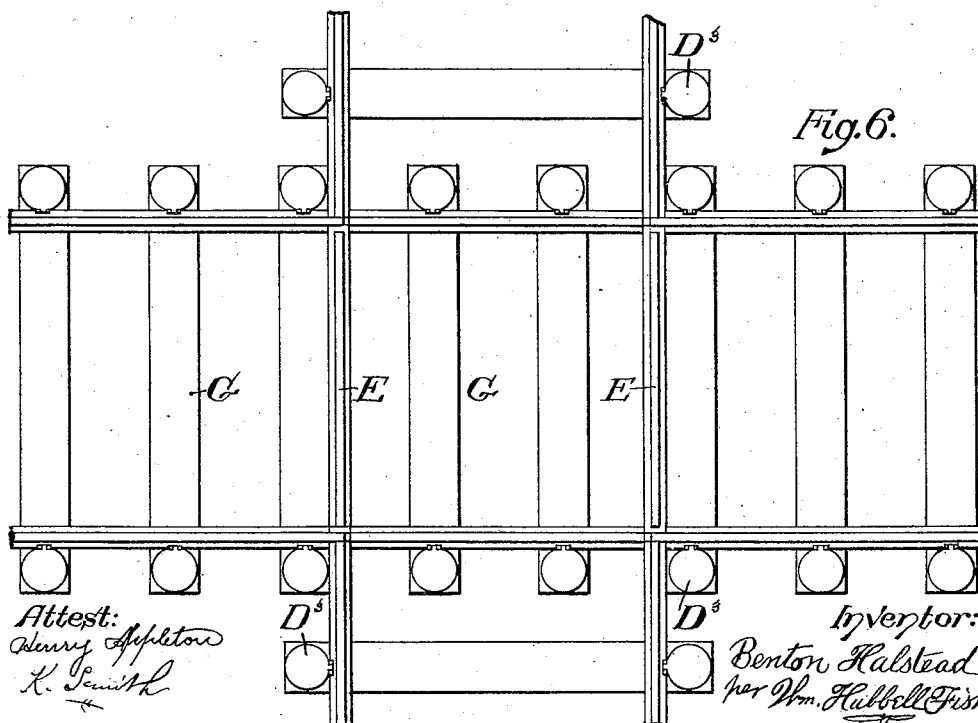
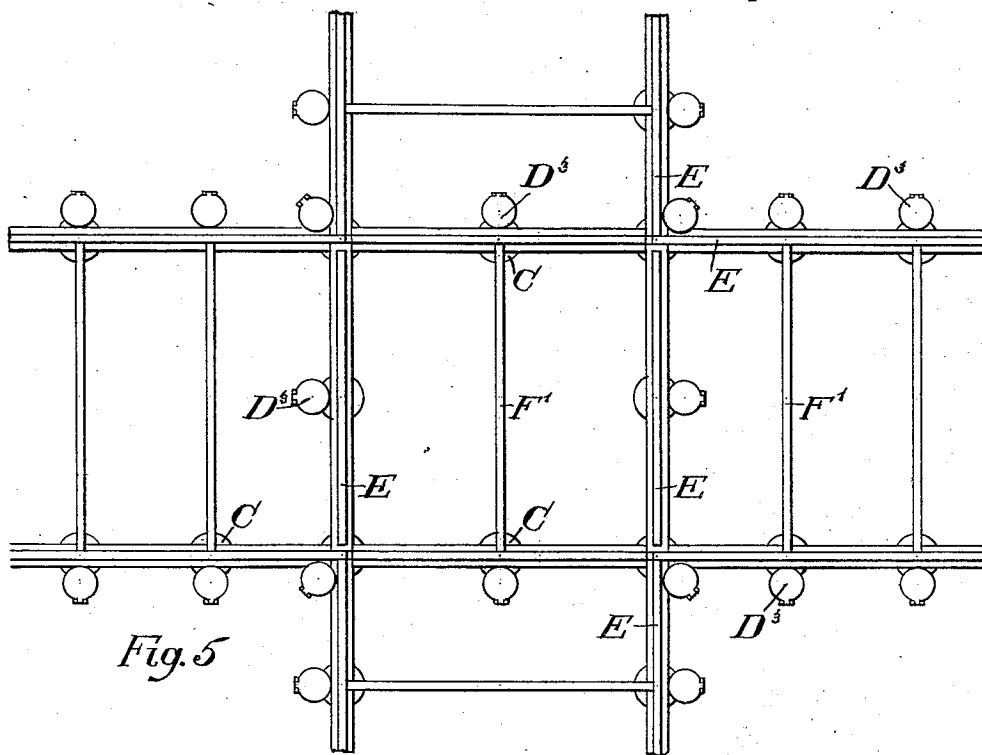
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UNITED STATES PATENT OFFICE.

BENTON HALSTEAD, OF RIVERSIDE, OHIO.

AUTOMATIC BALLASTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 472,994, dated April 19, 1892.

Application filed December 18, 1891. Serial No. 415,459. (No model.)

To all whom it may concern:

Be it known that I, BENTON HALSTEAD, a citizen of the United States of America, and a resident of Riverside, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Automatic Ballasting Devices, of which the following is a specification.

The railroads to which my invention is applicable are those which employ steel rails or rails of other tough and elastic substance for wheels to run upon.

The invention in general consists in a novel arrangement of metal, gravel, and earth whereby the passage of trains over the track improves, levels, and adjusts the track and keeps it from getting out of line, leaving it in better condition each time a train passes over it than previously, so that the more the track is used the better its condition becomes, excepting only as to ordinary wear and tear. At the present time the reverse of the above proposition is true of all operated railroads, hence the usefulness of my invention.

A useful feature of my invention is that whenever a railroad is built conformably to my invention or the device is attached to the cross ties or rails of a railroad as at present usually constructed the foundation need never be disturbed by ballasting, but is constantly being renewed by the process of running trains upon the track.

An inverted cone placed under steel rails or under cross-ties of a railroad and supplied with a hopper for gravel will when filled with gravel create a foundation which will sustain great weight and remain fixed and immovable when great weight is placed upon the said inverted cone. When filled with gravel and more gravel is forced into the cone through the neck of the hopper or funnel, the effect is to raise the cone upward, the force of a crow-bar plunged into the gravel through the neck of the hopper being communicated to the entire interior surface of the cone and upon the earth below, upon which the gravel in the cone rests. In building a road, the elastic rails being straight, it is only necessary to force sufficient gravel into the cone to cause it (the cone) to support a part of the weight of the rail and then an even surface is obtained and would forever remain were it not

that the earth upon which the road is built is of unequal solidity, and that the weight of the train forces the gravel deeper into the softer and more yielding substance, thus depressing one cone more than another. This defect it is the province of this invention to correct through the instrumentality of gravitation, and the elasticity of the rails agitated by the train passing over them sifting the gravel from the hopper down through the neck of same into the cone and filling up the cavity caused within the cone by the process described, thus correcting the inequalities and leveling up the track by the process of a train running along same, the only condition to obtain this end being that the hoppers be kept filled with gravel. The result is that the longer the road is in use and the more it is used the better it becomes and the less the amount of gravel necessary to correct inequalities as they occur.

In the accompanying drawings, making a part of this specification, and to which reference is hereby made, Figure 1^a represents an elevation of my automatic ballasting device attached directly to a rail, the latter being shown in cross-section. Fig. 1^b shows on the right a vertical central section of my self-ballasting device and showing the same attached directly to the rail, the rail being shown in cross-section and the securing-bolts in elevation. Fig. 2 is a top view of my self-ballasting device apart from the rail. Fig. 3^a shows in elevation my self-ballasting device as applied to a tie, the rail supported by the tie being shown in elevation. Fig. 3^b represents a vertical central section of my automatic ballasting device, as shown in Fig. 3^a, those portions of the tie adjacent to my device being shown in section. Fig. 4 is a top view of my automatic ballasting device shown in Figs. 3^a and 3^b. Fig. 5 represents in plan view a railroad-crossing where the railroad-tracks are provided with my self-ballasting device shown in Figs. 1^a, 1^b, and 2. Fig. 6 shows in plan view a railroad-crossing whose tracks are provided with my automatic ballasting device connected to the cross-tie.

C indicates a receptacle open at the bottom and substantially closed at the sides and at the top, except at the aperture through which the sand and gravel are to enter. The prefer-

able shape of the interior C^2 of this receptacle C is that of an inverted truncated cone, substantially such as shown in the drawings. The walls or annular wall C' of this receptacle C and also the top C^3 are of a suitable thickness to meet the requirements of the pressure from within outward, and also to properly uphold and sustain the weight of the superimposed rails and connecting rods or ties and plates and bolts, and also the weight of the superincumbent train passing upon and over these rails. The wall C' for these reasons preferably increases in thickness toward its upper end. Upon the top of this receptacle C is located the rail E or the tie G. In case the rail E is located upon the receptacle it is preferably placed thereon, as shown in Figs. 1^a and 1^b, and the base or foot of the rail E² is suitably secured to the receptacle.

In the present illustrative instance the rail-base is secured to the top C^3 of the receptacle by bolts or rivets E³, substantially as shown. In the absence of the usual wooden cross-ties G there will be present a suitable connection between the parallel rails of the track. Thus in Figs. 1^a and 1^b a rod F for operating as a tie extends between and passes through the web E' of opposite parallel rails of the track, the ends of the rod respectively carrying nuts F³, screwed thereon. Between the rails is a separating-piece, and this is preferably a tube F', located as shown—viz., around the rod F. The piece F' being of the requisite length to keep the rails apart the proper distance and the nuts on the rod F being screwed toward the rails, the latter keep the requisite distance apart.

In the event of the usual large wooden cross-tie G being employed and in cases where this tie is located directly upon the receptacles C, as shown in Figs. 3^a and 3^b, the receptacles are usually located farther apart than in the case illustrated in Figs. 1^a and 1^b.

Connected to the receptacle C is a second receptacle D for feeding sand, gravel, &c., to the receptacle C. For convenience of description this receptacle D will be hereinafter termed the "hopper." The hopper D is preferably of a conical or funnel shape, in order that the sand and gravel it contains may readily and surely descend from it into the receptacle C. The walls D' may be of a uniform thickness throughout, as there is no special weight to support. A passage D⁵, connecting the interior space D² of the hopper D to the interior space C² of the receptacle C, is present at or near the bottom of the hopper and at or near the top of said receptacle C.

In cases where the rail is applied to the receptacle, as shown in Figs. 1^a and 1^b, the hopper is preferably located as shown—viz., at the outer side of the rail and at one side of a plane passing through the center of the receptacle D and the longitudinal center of the rail. In such event the hopper may have that wall of it which is next the rail vertically straight, substantially as shown in said Figs.

1^a and 1^b. The connecting passage-way D⁵ at the bottom of the hopper enters the chamber C² at the top portion of one side of the latter. In the instance shown in Figs. 3^a and 3^b the passage D⁵ connects the bottom of the chamber D² of the hopper with the top of chamber C² of the receptacle C.

For convenience of application the passage D⁵ extends down through the tie G. As one mode of securing the proper alignment of the hopper D and receptacle C and the passage-way D⁵, a tube D⁶ is present through the tie G and connects the said hopper and said receptacle, the interior space of the tube constituting the passage D⁵. This tube also serves to maintain the receptacle C and the hopper D in their desired positions relative to the tie G. The tube will ordinarily be rigidly attached to the hopper D and receptacle C and hold the latter rigidly against the tie. Moreover, the tube will preferably fill the opening through the tie without lateral play. Thus the receptacle C and the tie G and the hopper D will be as if of one piece.

The rails E E are secured to the cross-tie in any desired or well-known manner.

The hopper is preferably provided with a cover D³, hinged to the former near or at its edge at D⁴.

In the application of my invention to practice the receptacles C are duly placed upon the road-bed, and by means of their respective hoppers are filled with gravel and sand.

The location of the receptacles C in relation to the upper surface of the road-bed will depend upon whether they are used with thick ties, as G, or without such ties, as in Figs. 1^a and 1^b. In the former instance the upper portions of the receptacles C will be at or near the surface of the road-bed. In the latter instance the top portions of the receptacles will lie somewhat below the surface of the road-bed. After the receptacles are filled with gravel and sand the hoppers are again filled with gravel and sand. As the train passes over the rails the extra downward pressure upon the latter forces the receptacles down a little by compacting the earth directly below the receptacle, and also the sand and gravel in the chamber C² of the receptacle C. As the train leaves a given rail the latter will spring upward and raise the adjacent receptacle a little. As the latter rises a small space will be left between the top C³ of the receptacle and the sand and gravel of the receptacle. Immediately sand and gravel from the hopper will pass into the receptacle until the latter is again filled. This process of packing and compacting the said contents of the receptacle C and refilling it will take place as each successive train passes over the rail, which it (the receptacle) supports. Thus a process of automatic tamping is carried on, and the rail is sustained on a hard firm base and at the proper level. Sufficient sand and gravel is at all times to be kept in the hopper to keep the receptacle C full of the same. In this way

and by these means the railroad is kept continuously ballasted. Its condition improves as it is used.

As hereinbefore indicated, the receptacle C may support the rail directly or through the intervention or agency of intermediate devices or means.

Another valuable mode in which my invention may be employed is as follows: The receptacle C and hopper (shown in Fig. 1^b) may be attached to any rail between the cross-ties of any railroad at a place where the foundation is not self-sustaining, and thus patch up the worst of such parts without going to the trouble and expense of boring holes through the said cross-ties.

I desire to call the attention to another important function which the hopper performs when located as indicated in Figs. 1^a and 1^b—viz., at that side of the receptacle C which is at the outside of the track of the road-bed. This function is as follows: The sand, gravel, or earth passes down from the hopper into the receptacle C, and a larger amount will pass to the outer portion of the interior space C² than to the opposite side of the interior space, and this added sand will thus have a tendency to press up the receptacle from beyond the outside rail, thereby not only counteracting the weight of the hopper, but also giving to the track structure a broad foundation and support.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. The railroad-ballasting device consisting of the receptacle C, open at the bottom and provided with a hopper for feeding gravel, sand, earth, or other substance to the receptacle C, supporting the rail or track structure, substantially as and for the purposes specified.

2. In combination with a railroad-bed, the receptacle C, whose chamber C² is open at the bottom and larger there than at the top, and the hopper D, connected to the receptacle C by a passage-way, substantially as and for the purposes specified.

3. In a self-ballasting device and a foundation for the support of the rail, the receptacle C, whose chamber is of the form of a truncated cone, and a hopper, substantially funnel-shaped, connected to the receptacle C by a passage-way D⁵, substantially as and for the purposes specified.

4. In a self-ballasting device and a founda-

tion for the support of the rail, the receptacle C, whose chamber is of the form of a truncated cone, and a hopper, substantially funnel-shaped, connected to the receptacle C by a passage-way D⁵, located in the upper part of the receptacle, substantially as and for the purposes specified.

5. The railroad-ballasting device consisting of the receptacle C, open at the bottom and provided with a hopper for feeding earth to the receptacle, the latter supporting the rail or track structure, and the lid covering the hopper, substantially as and for the purposes specified.

6. The railroad-ballasting device consisting of the receptacle C, open at the bottom and provided with a hopper for feeding gravel, sand, earth, or other substance to the receptacle C, the rail resting on the top of the receptacle and secured thereto by bolts or rivets E³, substantially as and for the purposes specified.

7. As a new combination of self-ballasting device and track, the receptacle C, open at bottom for the reception of gravel, sand, earth, or other substance, and the hopper for feeding said mobile substance or substances to the receptacle, and the rails respectively bolted to and upon their respective receptacles, and the cross-ties F, connected to the webs or sides of the rails, and the separating-pieces F', embracing or accompanying said tie, substantially as and for the purposes specified.

8. The railroad-ballasting device consisting of the receptacle C, open at the bottom and larger there than at the top and provided with a hopper for feeding gravel, sand, earth, or other substance to the receptacle C, the rail resting on the top of the receptacle and secured thereto by bolts or rivets E³, substantially as and for the purposes specified.

9. A railroad-ballasting device consisting of the receptacle C, open at the bottom, provided with a hopper feeding gravel, sand, earth, or other substance to the receptacle C for supporting the rail or track structure, the opening from the hopper to the receptacle being located at that side of the receptacle C which is at the outside of the road-bed, substantially as and for the purposes specified.

BENTON HALSTEAD.

Attest:

GEORGE HENDRICH,
WILLIAM L. BRYATT.