(No Model.) 4 Sheets—Sheet 1.

T. G. GRIBBLE.

STREET RAILWAY TRACK.

No. 446,446. Patented Feb. 17, 1891.

Fig. 1.

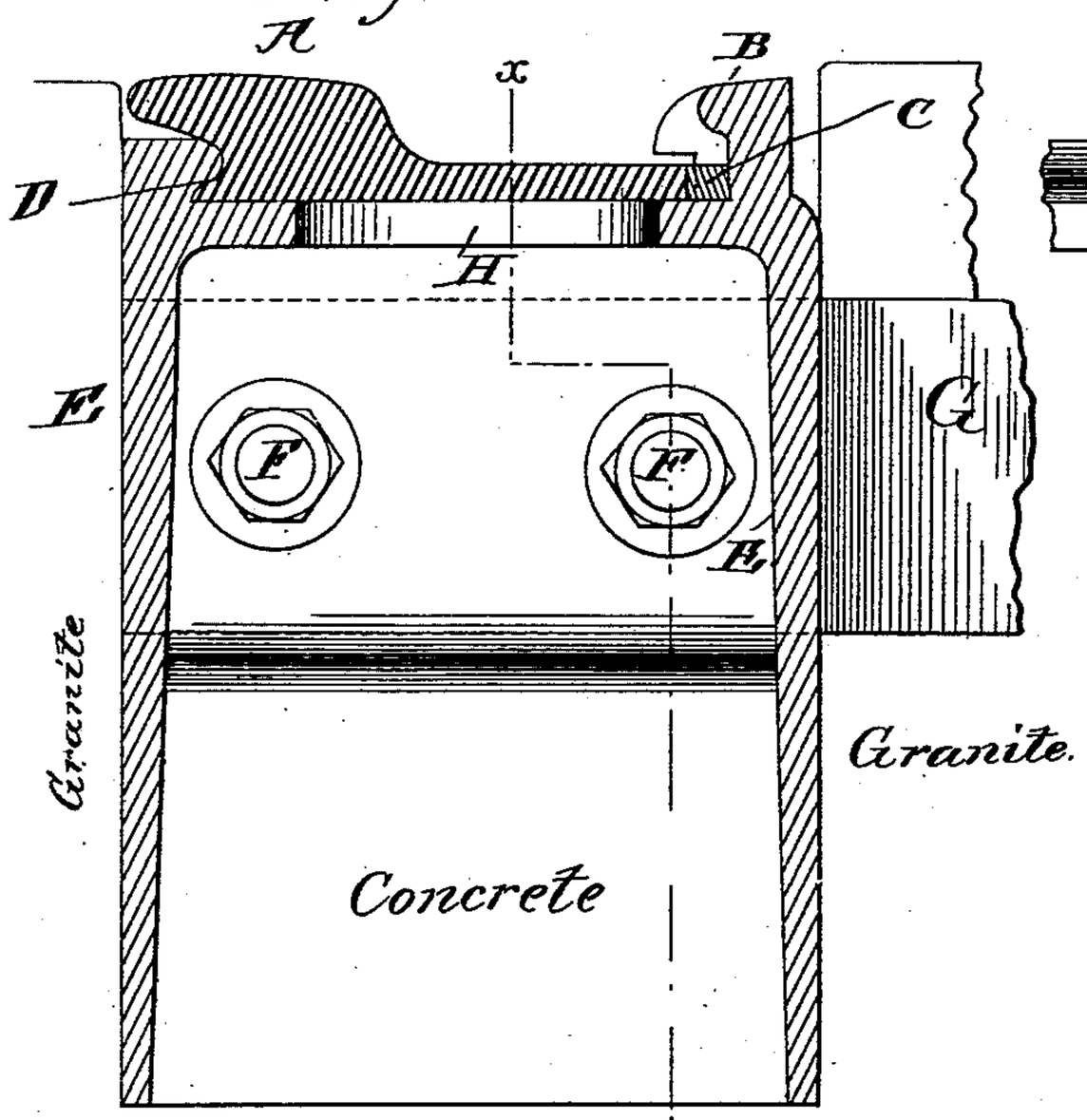


Fig. 2.

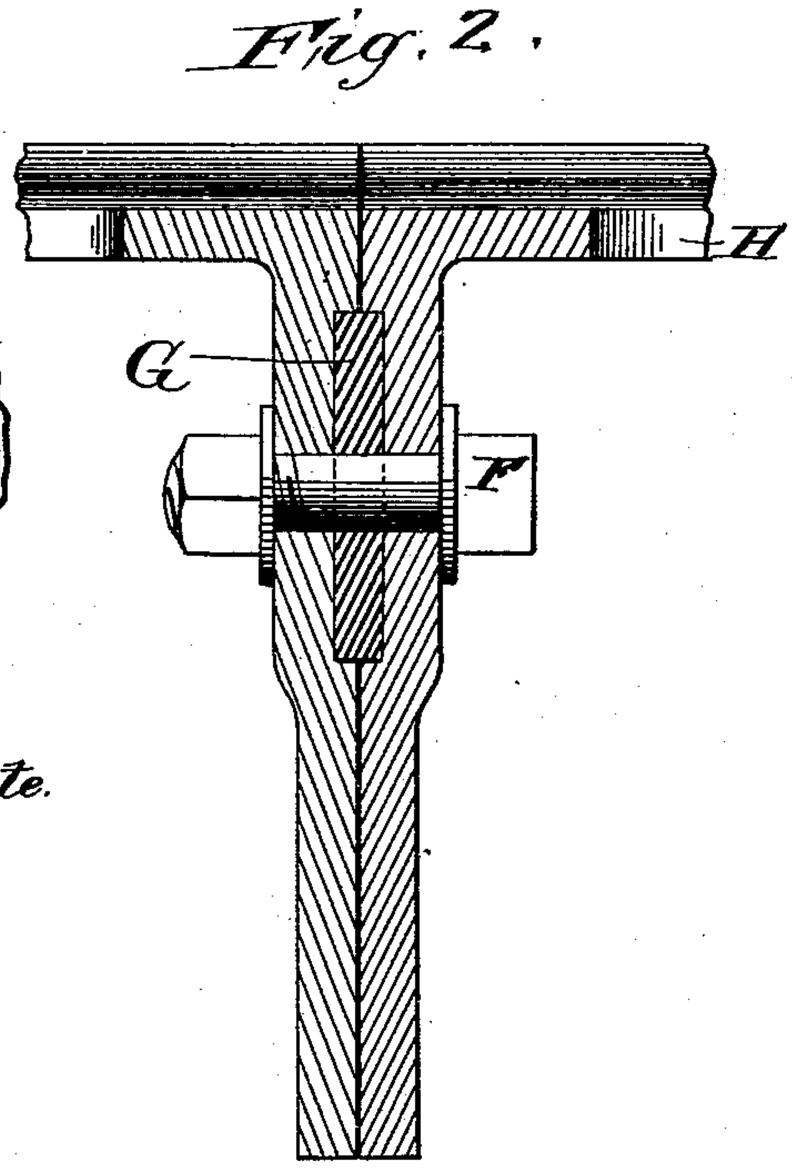
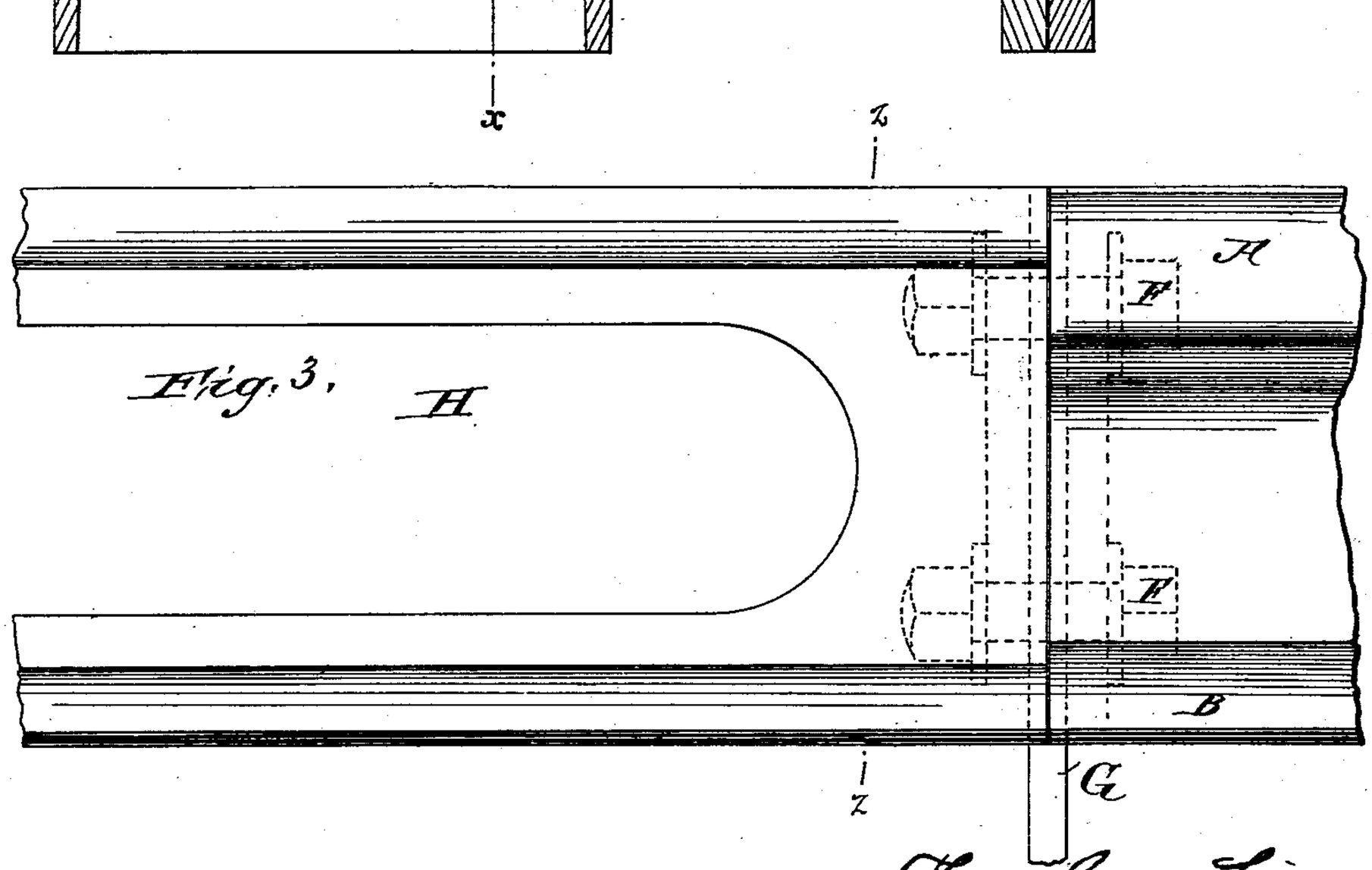


Fig. 3.



Witnesses;
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L. L. Griffith

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Inventor;

By Francis M. Effley
his Attorney.

(No Model.) 4 Sheets—Sheet 2.

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STREET RAILWAY TRACK.

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Fig. 5.

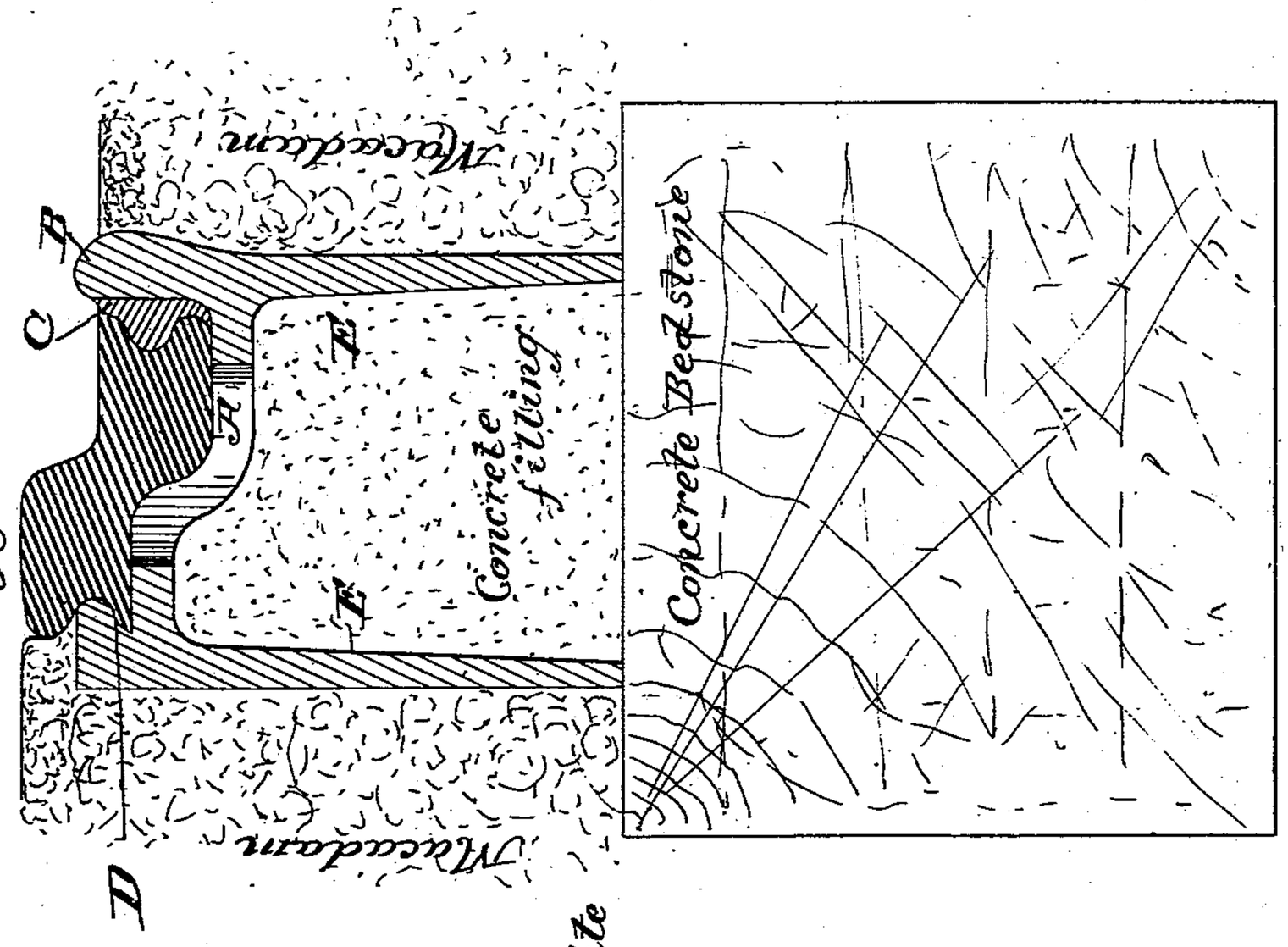
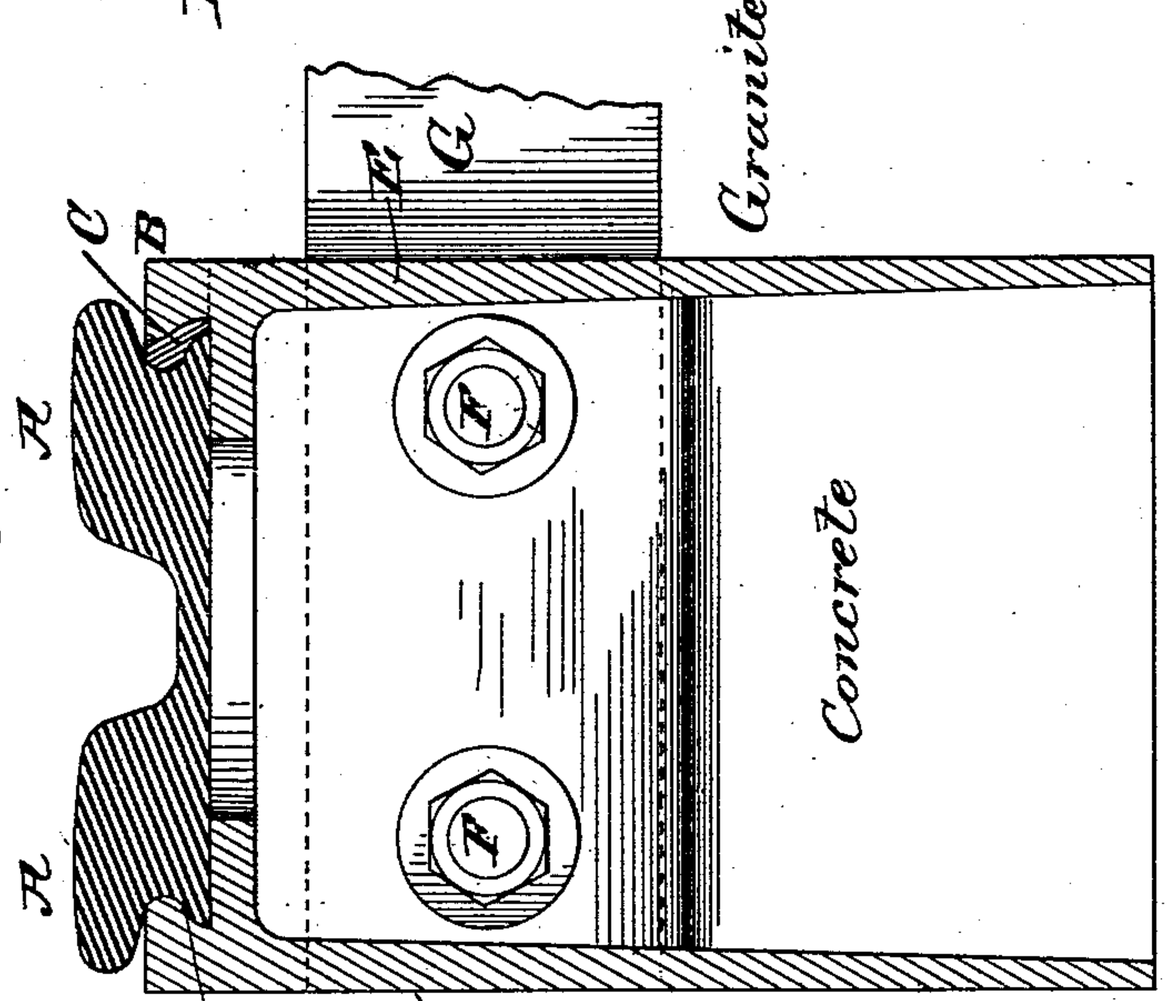


Fig. 4



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(No Model.) 4 Sheets—Sheet 3.

T. G. GRIBBLE.

STREET RAILWAY TRACK.

No. 446,446. Patented Feb. 17, 1891.

Fig. 4.

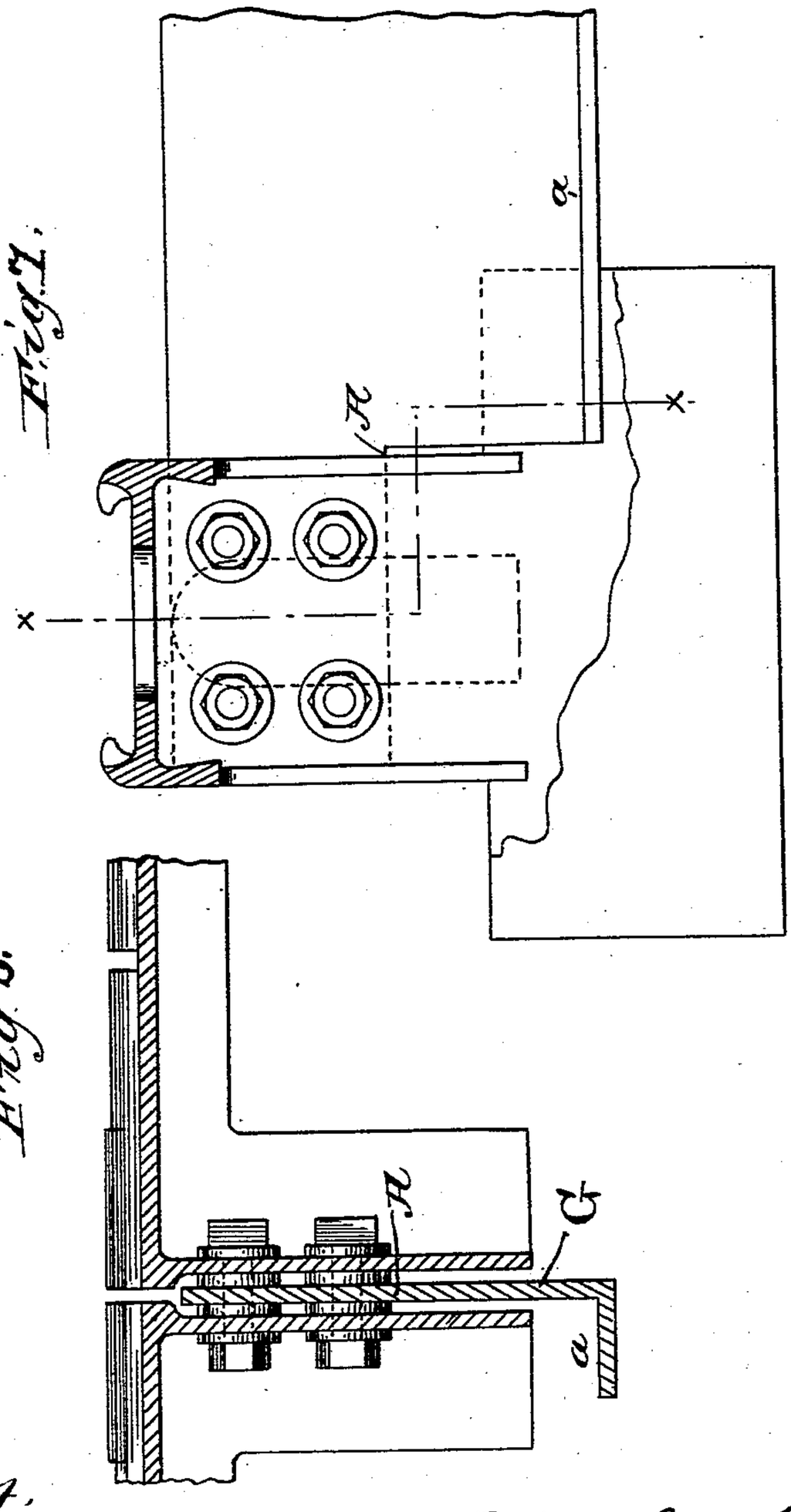

Fig. 5.

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(No Model.) 4 Sheets—Sheet 4.

T. G. GRIBBLE.

STREET RAILWAY TRACK.

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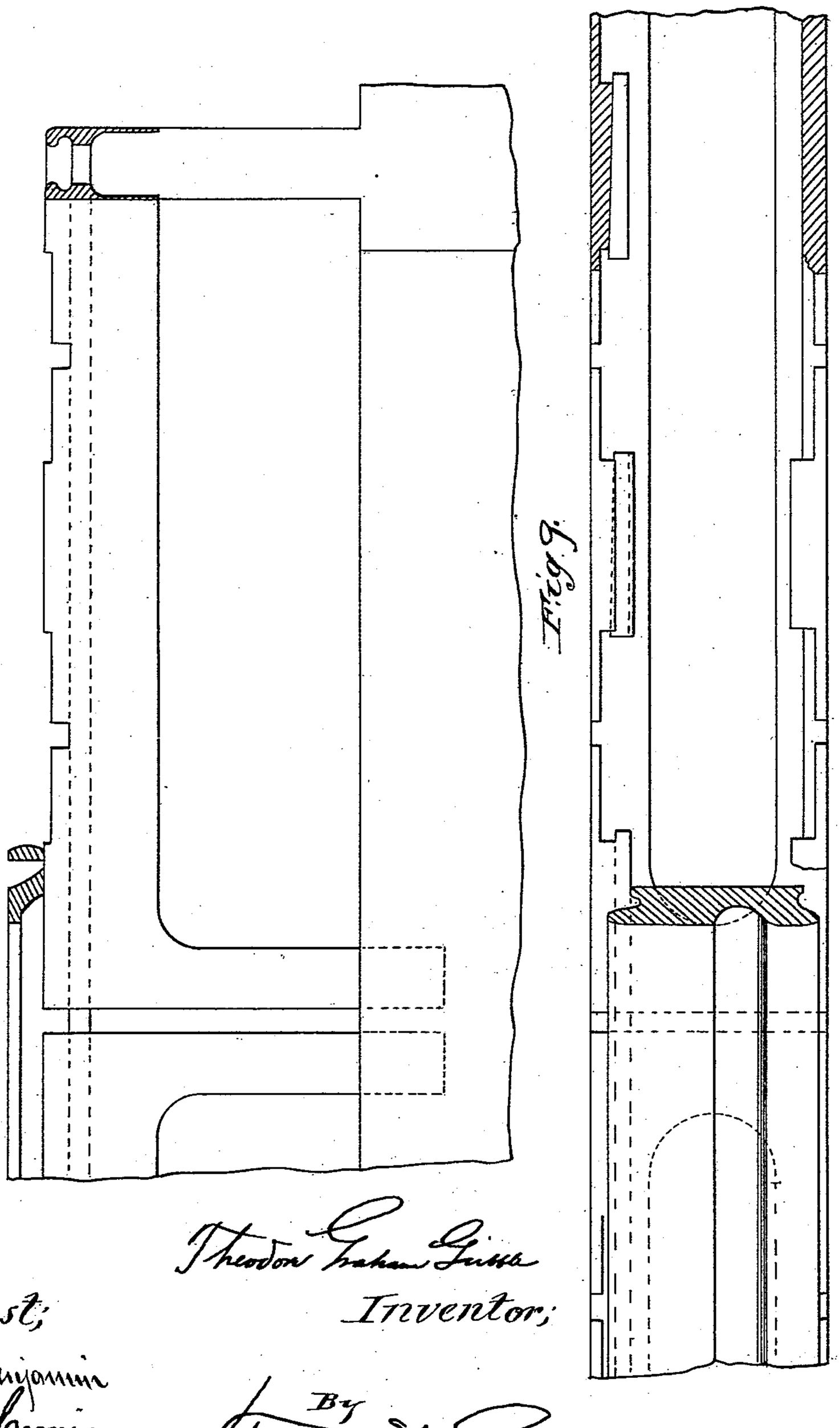

Fig. 1.

Fig. 2.

Attest;
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his Atty

UNITED STATES PATENT OFFICE.

THEODORE GRAHAM GRIBBLE, OF YONKERS, NEW YORK.

STREET-RAILWAY TRACK.

SPECIFICATION forming part of Letters Patent No. 446,446, dated February 17, 1891.

Application filed November 8, 1890. Serial No. 370,813. (No model.)

To all whom it may concern:

Be it known that I, THEODORE GRAHAM GRIBBLE, a citizen of London, England, residing in the city of Yonkers, State of New York, have invented a new and useful Improvement and System of Constructing Street-Railway Tracks, known as the "Gribble Box-Girder Track and Dovetailed Rail," of which the following is a specification.

My invention relates to improvements in the construction of railway-tracks, first, by abolishing entirely all wood in connection therewith and by substituting in place thereof iron or steel, with concrete or other analogous material; second, by the employment of a continuous hollow iron or steel box in place of the ordinary wooden stringer, and in the use of concrete or other analogous material in connection therewith, said iron or steel box acting as a mold to shape the stringer or upper portion of the concrete or other analogous mass; third, the introduction of flanges or lips in connection with the iron or steel boxes in conjunction with metal wedges to hold the rail in place upon the top of the aforesaid iron box; fourth, by the introduction of a flat rail with dovetails and reversible heads, and which is held in place by means of flanges and wedges in connection with the aforesaid boxes and without the use of bolts or spikes. I attain these objects by the mechanism illustrated in the accompanying drawings, in which the annexed sheets represent as follows:

Figure 1 is a transverse section of the track and removable step-rail with wedge attachment. A is the wearing-rail; B, the lip; C, the metal wedge to hold the rail in place; D, the dovetail; E, the metal box, and F the bolts which hold the plates and fasten the ends of the metal box E, making a continuous iron stringer; G, tie-rod or track-gage. Fig. 2 is a longitudinal section of the ends of two iron boxes, showing bolts F and one form of tie-rod; Fig. 3, ground plan; H, an opening at top of iron box, through which the concrete is introduced before adjusting the rail A; Fig. 4, a double-headed end-for-end reversible grooved rail and cross-section of iron box, lettering as in Sheet 1; Fig. 5, reversible double-headed step or side bearing-rail for use in the macadam streets, otherwise the same as in Fig. 4. Fig. 6 is a view, partly in section, showing another form of tie-rod. Fig. 7 is a side view of same. Fig. 8 is a side view, and Fig. 9 a plan view, of the boxes with one rail in place thereon.

The foundation of the tracks will be of concrete or other analogous material, made in the usual manner and laid in longitudinal trough or trench. Broken stone packed and rolled and grouted with tar or pitch may also be used, or the side of the box may be flanged outward at the bottom and bolted to timber cross-ties. The use of any kind of timber is not, however, recommended. The width and depth of concrete will be regulated by the supporting power of the soil and the maximum loads to be supported.

The box-girder.—The rail is carried upon a casting of iron or steel E, Fig. 1, forming a continuous hollow stringer-box or longitudinal sleeper. The concrete inside this box forms by cohesion a monolithic mass with the lower concrete and affords the rail vertical stability without the need of down-fastenings, such as sleepers, cable-yokes, or holding-down bolts. The upper surface of the box, Fig. 3, carrying the rail has openings for filling in and tamping the concrete or other analogous material, and is furnished with shallow dovetailed flanges or key-seats at the top of the box, to which the rail is wedged. These flanges are semi-continuous, varying in length from about three inches to about six inches, the spaces between them being about one inch longer than the key-seats, as shown on Figs. 1 and 2, Sheet 3. They are at all times accessible for tightening the wedges without disturbing the adjacent paving or interfering with the use of the track. The boxes are in lengths of about twelve feet, having closed ends, provided with bolt-holes and recessed to admit a distance-piece or tie-plate G, which will keep the tracks to gage and also act as a support to the boxes. For heavy-rolling loads the tie-plates will be of the same or greater depth than the box, flanged at the bottoms and resting upon a transverse bed of concrete, as shown in Fig. 4. The boxes will be bolted together in position by wrenches operated through the openings in the upper

surface, and split steel washers or other forms of spring-washers will be used to allow for expansion.

The box-girder serves a sevenfold purpose: first, as a mold in shaping the upper portion of the concrete or other analogous material placed upon the foundation, transforming it into a continuous solid mass of stone shaped something like an inverted T; second, as an additional strength and anchorage to the concrete mass; third, as a protection to the concrete from the shocks of traffic; fourth, as an attachment to the rail to hold the same in place; fifth, as a vertical wall to the paving; sixth, by enabling the use of a rail of less than one-half in weight of the ordinary girder-rail, but which presents the same amount of strength and exposed wearing-surface as the girder-rail of two or three times its weight; seventh, by enabling the use of harder and more durable quality of steel in the wearing-surface of the rail without danger of fracture.

Rails.—The rails used will be of "flat-rail" type, rolled with dovetails to fit the flanges. They will be inserted sidewise, cramped up to a true bearing, and wedged with wood or metallic keys. The dovetail under the wearing-head of the rail will form a semi-continuous bearing; but at the opposite extremity the dovetail key-seats in the box-flanges will be at frequent intervals tapered in the contrary direction to the creeping tendency of the rail, spaces being left for the insertion of wedging-hammers.

The double-headed reversible grooved rail differs, essentially, from the center bearing-rail which has only one head with two bearing-surfaces. It has two distinct heads, one of which is only subject to vehicular traffic and will be comparatively unworn. When the rail requires to be reversed, the worn head will yet be good for years of vehicular traffic. The two heads form a groove of suitable proportion for ready cleaning, and one which will afford a convenient passage for vehicles. This rail has nothing in common with the English double-headed rail, which is vertically reversible, but, like the center bearing-rail, wears almost uniformly by fatigue and crystallization of iron, whereas in this type the unused head is under practically no stress until it is reversed and used. The double-headed reversible step-rail is shown in Fig. 5 as applied to a macadamized road, but may also be adapted to a paved street. The second head is here not exposed to any wear. The "tram" of the rail is made sufficiently thick to allow for a small amount of wear due to vehicular traffic. The single-headed step-rail is of the lightest form of rail-section, and consequently the least first cost. The box-flange forms a lip to cover the wedges and at the same time a curb to the paving. The principle of the system admits of a great variety of dimensions and arrangement of parts, according as strength or economy is desired.

Method of construction.—The alignment of the foundation will be from a center line of the surveyor's pins by offsets at right angles in the usual manner. Longitudinal trenches will then be dug and afterward filled with concrete to the desired level of the bottom of the box-girder. While the concrete is still green one line of boxes will be placed in position upon it and aligned exactly by means of a nick cast in the upper surface of the box, which will correspond with the gage-line of the rail when in place. The tie-plates will then be inserted and bolted up. The boxes will then be carefully leveled or "trued" to grade and filled with walnut-sized concrete by means of funnels inserted at the openings at the top of the box. A board stop will be inserted to keep the concrete from the bolts at the ends of the boxes and the space afterward filled with sand, in order to give access to the bolts and to enable any box to be removed without disturbing the rest of the track. A second line of boxes will then be laid in similar manner; but alignment will be required no farther, as the tie-plates will preserve the gage. Care will be taken, however, not to disturb the green concrete in the first line of the boxes. The rails will then be inserted and cramped to a firm bearing, care being taken that the dovetail in the box is clear. The wedges will be driven by a light hammer, a striking-block being inserted with a crook, so as to receive the blow of the hammer without danger of striking the casting. The little spaces between the wedges will be filled with sand or hard clay, so as to leave the wedges nearly accessible. The construction on curves or switches will be the same as on tangents. The extra work of curves and crossings will all be done in the shops, leaving nothing more to be done upon the ground than to select the special rails and castings according to their position as shown by the shop stamps. A complete set of special sizes of boxes and rails will be prepared, so that a tangent can be turned off into a curve at any required point.

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

1. The combination of a railway-rail with a continuous longitudinal open-bottomed metallic support having also openings in its top, as set forth, said box acting also as a mold for the forming of the upper portion of the concrete structure.

2. The combination, with the railway-rail, of the longitudinal support provided with the dovetail flanges and key-seats and the wedges, as set forth.

3. The combination, with the longitudinal support provided with dovetail flanges, of a rail having a flat base, a double tread on its upper side, and dovetail flanges to engage the support, as set forth.

4. The combination, with the concrete foundation, of open-bottomed box-shaped longitudinal supports and their attachments so embedded in the concrete that the latter shall hold the supports firmly down and in

position without the use of bolts or similar fastenings, as set forth.

5. The method of constructing the rail support of a railway, which consists in laying a longitudinal bed of concrete or other analogous material, laying thereupon the hollow girder, and then filling the interior thereof with concrete or the like material, the same cementing with the lower bed thereof, as set forth.

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Witnesses:

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