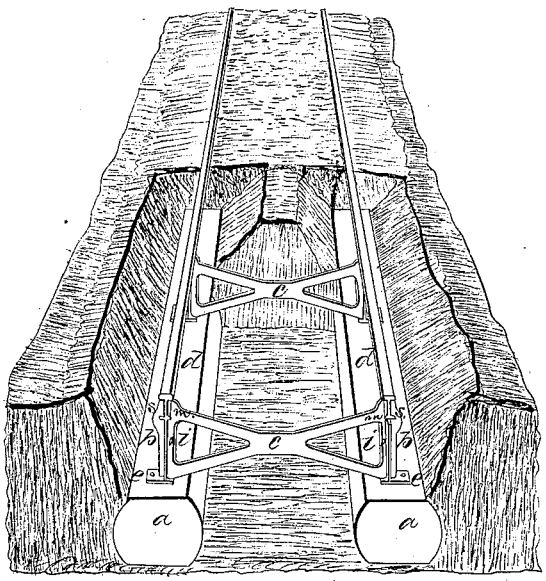
J. Stimpson,

Railroad Track,

No. 1,262. Patented July 26, 1839.

No. 1



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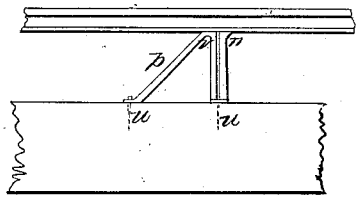

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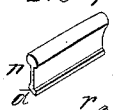

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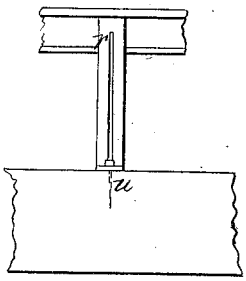

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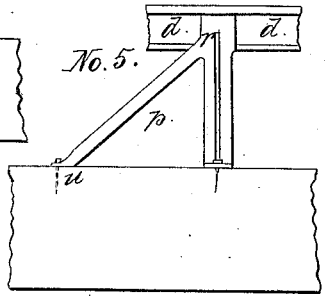

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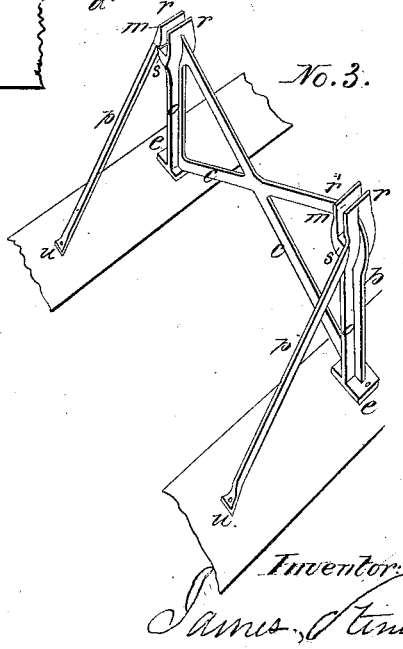

No. 7.

Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES STIMPSON, OF BALTIMORE, MARYLAND.

MODE OF CONSTRUCTING RAILROADS.

Specification of Letters Patent No. 1,262, dated July 26, 1839.

To all whom it may concern:

Be it known that I, JAMES STIMPSON, of the city of Baltimore and State of Maryland, have invented a new and Improved Mode of Constructing Railroads; and I do hereby declare that the following is a full and exact description.

The nature of my invention consists, for the superstructure of rail roads, in first placing heavy square or other shaped timber string pieces or logs (*a. a.* No. 1) hewed, or slabbed by saws upon two side at least (that is, the sap should be removed from the top and bottom as laid in the earth) and these string pieces are to serve for the foundation of the road and are to be laid in two continuous and parallel rows about 18 inches below the surface of the earth, for the support of cast iron chairs (*i i*, No. 1). The chairs are to be fastened upon the tops of the string pieces and the longitudinal iron track rails (*d. d.*) are to be secured in openings in the tops of the chairs, in the manner hereinafter described. These chairs are formed with two upright standards (*o. o.*, No. 1) resting upon the middle laterally of each string piece about the width of the track apart and 18 inches high, connected by two cross ties (*c* No. 1) ranging from the tops of one to the bottom of the other, and crossing each other in their centers.—

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.—

When the road is being graded, where there are embankments to be raised, as soon as they are sufficiently high to meet the line of grade where the bottom of the string pieces should be and have been properly consolidated, then the string pieces (*a a*, No. 1) may be bedded and leveled upon said grade and after the chairs (*i i*) have been placed upon them and the track rails fastened into the standards of the chairs, the whole superstructure should then be covered or filled up with gravel or sand to near the top of the track rails (*d. d.*) or to the final finish of the intended upper surface of the earth; and the track in the above condition will serve as a ready means of conveying the sand or gravel from the cuts for filling it up with. But when passing through cuts, channels may be sunk to where the levels of the under sides of the string pieces (*a. a*) should be, leaving something of a ridge between the channels, but not so much as to materially interfere with the cross ties (*c. c.*) of the chairs. That mode of procedure will save some digging out and filling in again between and outside of the string pieces. The upper surfaces of these string pieces (*a. a*) are to be laid horizontal, or level with each other and in every way to conform to the intended grade of the upper surface of the track rails (*d. d*) of the road. Their ends, where they join each other in soft ground, may be laid upon a wooden block or flat stone, to prevent one end from settling below the other; but care should be had to cut them to such lengths as to conform to the lengths of the iron track rails (*d. d*) so that the chairs (*i. i*) should not come nearer to the ends of the string pieces than half the distance the chairs are apart, in order to avoid the pressure at or near the ends of said string pieces. And these string pieces (*a. a*) ought to be in size, equal to the area of a square foot and as much larger as convenient. The earth upon which these string pieces are bedded should be well equalized for solidity, that they may have a uniform and permanent bearing upon it; and they should be laid at such a distance apart, that each upright standard (*o. o*) of the chairs should rest as near as may be on the middle laterally of each string piece. And to prevent any lateral movement of the ends of said string pieces while being laid and as a means of keeping them from mismatching, in addition to what the chairs will hold or confine them, short pieces of hoop-iron may be driven down into them, one half of the width of the iron, in one end and the other half in the other adjoining end of the next string piece, which will be equal in strength to a double tenon, or tenon and mortise to keep them together. The chairs intended to be placed upon these string pieces are to be about 18 inches high from their feet (*e e*, No. 1) to the upper ends of the jaws of the openings (*m. m.*) which are to confine the track rails, so that when the earth is filled in say to within one inch of the tops of the track rails it will bring the upper surface of the string pieces (*a a*) upon which the chairs rest say 18 inches below the surface of the earth in the finish; but the chairs may be varied in height according to the quality of the soil, &c., the main object of which is to prevent decay of the wood or any deviation from the original grade or level of the road as at first laid, and that nothing but cast and

wrought iron shall be exposed to heat or moisture or to the action of the atmosphere at or near the surface of the earth.

The chairs are formed in the following manner, viz: They consist of two upright standards (*o*, *o*, No. 3) which will be central under the track rails and two cross ties (*c*, *c*, No. 3) which connect and extend from the top of the standard upon one string piece, to the foot of the standard upon the other string piece.

The upright standards (*o*, *o*, No. 3) are formed of two plates of cast iron about three inches wide each and half an inch thick and cross each other longitudinally in the middle of each plate, forming a cross, a horizontal section of which is shown at Fig. No. 7, and each standard (*o*) has an opening (*m* No. 3) at the top, just so deep as to allow the bottom of the track rail (*d*, No. 4) to reach and bear upon the bottom of the opening and at the same time, the under sides of the cheeks (*n*, *n*, No. 4) of the track rail to touch and bear upon the top edges (*r*, *r*, *r*, *r*, No. 3) of the jaws of the openings, thereby preventing any leverage of the rail over the jaws of the standards to burst them open. Thus the undersides of the cheeks (*n*, *n*, No. 4) of the track rails rest upon the tops of the standards (*r*, *r*, *r*, *r*, No. 3) or jaws of the openings, as does also the bottom (*d*, No. 4) of the rail upon the bottom of the openings (*m*, No. 3): and as the jaws of the standards are four inches long longitudinally of the road and as the rail bears upon three different parts of it viz: the bottom of the opening and upon the top of each jaw they afford twelve inches longitudinal bearing to the rail. The jaws (*r*, *r*, Nos. 3 and 5) of each chair that is used at the joinings of the iron track rails (*d*, *d*, No. 5) may be made four inches long longitudinally of the road and the standard below three inches; but the jaws of the chairs (*r*, *r*, No. 6) placed between the first mentioned chairs, need be only three inches long, or continued up the same size of the standard. The first named chairs (Nos. 3, 5, and 2) should have a start (*v*, see No. 2) cast near the center of and across the bottom of the openings of the jaws—that is one side of the start should be exactly at the center of the opening which start, should be about $\frac{3}{8}$ths of an inch thick and high, and all its thickness upon one side of the middle of the bottom of the opening longitudinally, which would require a notch to be cut out of the bottom of every other rail (see *v*, No. 2) of the proportionate or same size of the start, and said start, thus cast across the bottom of the openings is intended to prevent the rails from moving endwise, which upon up and down grades, they would be liable to, unless prevented by other means than the wedges that are to be driven into the openings (*m*, *m*, No. 1) and which should not be driven very hard. And these same chairs (No. 2, 3 and 5.) used at the joinings of the track rails, may have braces (see p. Nos. 2, 3 and 5) reaching and ranging from near the top of the outer jaw of the openings of the standards to a level with the foot of the standard, upon an angle of about 45 degrees, with a small foot and hole through it (*u*) for a spike or bolt to fasten it to the string piece or foundation timber; but none of the chairs such as (No. 6) used between those at the ends of the track rails will require either braces or starts.

The jaws of the openings (*m*, *m*, No. 3) should be about half an inch thick transversely of the road at top and more at the bottom, especially upon the outside jaw, and the upright rib outside, against the bottom of the opening should be much wider as at (*b* Nos. 3 and 1) than below, or near the top to serve as a brace to strengthen the jaw and to prevent its breaking by lateral pressure. These openings (*m*, *m*, No. 3) in the standards should be a little wider than the thickness of the rib (*d*, No. 4) at the bottom of the rail; say if the rib of the rail is $\frac{3}{4}$ths the opening (*m* Nos. 1 and 3) should be $\frac{7}{8}$ths of an inch wide laterally and have an offset (*s* Nos. 1 and 3) cast into the inside of the outer jaw, directly at the bottom of the opening as large as is the outside of the rib of the rail (*a* No. 4), so that when the rail is in place (see No. 1) and the key or wedge is driven into the space (*m* No. 1) between the inner jaw of the chair and the rail, the outer rib upon the under edge of the rail will be secured within the offset (*s*) cast in the inside of the outer jaw and thus prevent the rails from rising out of the chairs, and by removing the wedges alone, the rails also can be removed at pleasure. These wedges may be either zinc, wood or iron. Zinc I should prefer, the thin ends bent over or cut up to prevent their getting out, and in that case the thin plates of zinc hereafter mentioned may be omitted between the jaws; if of wood they may be held by a nail driven into the thin end in front of the iron jaw.

The upright standards (*o*, *o* No. 3) including the openings are designed to be about 18 inches from top to bottom, based upon plates or feet (*e e*) say three inches longitudinally of the road and four inches transversely and about $\frac{1}{2}$ an inch thick, forming a face of 12 square inches, and so placed under the standard that it shall extend one inch out from or beyond the outside upright rib, thus to afford room for the spike or bolt holes through it whereby to fasten it to the string pieces. These standards (*o*, *o*) are about as wide apart as are the track rails to be and are connected by diagonal braces or ties (*c c*) which ties cross each

other in the middle of the road track, ranging from the top of one standard to the bottom of the other and the other vice versa, forming the letter (*x*) and connect with the inner rib of the standards and should be ½ an inch thick longitudinally of the road and two inches wide vertically and ought to be a little thicker and wider at their junction with the standards than elsewhere; hence the standards (*o*, *o*) are held together and upright transversely by these crossties (*c c*) with a strength of more than 10000 lbs. to prevent their breaking by lateral pressure: and the standards (*o*, *o*) crossties (*c*, *c*) and feet (*e*, *e*) are all cast in one piece.

A thin plate of sheet-zinc may be, or may not be, as thought best, placed between the rails and the jaws of the chairs in the openings (*m m*) in case wooden wedges are used; also between the spike or bolt heads which fasten the chairs to the string pieces and the feet of the standards, to prevent or retard oxidation. If the string pieces are 40 feet long each, it will require but 264 to lay a mile of two rows, and if the iron rails are 20 feet long, it will require 264 chairs with braces and starts, and 1056 without at four feet apart center to center, which will weigh from 56 to 60 lbs each.

I use iron rails, of wrought iron (No. 4), cheek 2¼ inches wide laterally upon the top and ⅞ths thick vertically; center part ⅝ths thick laterally and 3¼ inches vertically between the cheek and rib; rib ⅝ths of an inch vertically and ⅞ths thick laterally, which will weigh 45$\frac{88}{100}$ lbs. per yard and bear—the chairs being 4 feet apart—7052 lbs. without flexure, taking the lowest formula for the strength of wrought iron. But to place the chairs five feet apart, then 264 with braces, and 792 without and at that distance apart the above rails will bear without flexure 5566 lbs. at the lowest computation. The ends of the rails may be beveled, squared, or made with a tenon and mortise as desired.

It will now be seen, that by the use of the high chairs, the wood may be sunk so deep, that it will not decay in from 50 to 100 years, and owing also to the depth under the earth and the length and size of the string pieces, they will not alter their original level or grade while they do last, which will save an immense sum, usually required in the repairs of common roads; that the wood affords the best foudation, owing to its elasticity and that all that will be exposed to the weather, heat and moisture, is wrought and cast iron; and it has been found that the friction of the wheels, magnetize, or so charge the rails with magnetism or electricity, that they do not oxidate as it was at first suspected they would—that the zinc if applied according to Sir H. Davy's theories will prevent the cast iron chairs and bolt heads from oxidating, and it is universally known that cast iron under any circumstances is not so liable to oxidate as wrought iron, and also that when the earth is raised to quite near the tops of the track rails, it will destroy all the ring and a great proportion of the jar. Hence being founded upon wood thus immersed in the earth, it will prove the most pleasant, dead and soft sounding road yet constructed, and the chairs being cast in but one piece for both rails, the accuracy in the width will exceed all other roads and save a vast deal of the time in the facility of construction that is usually expended in the endeavor to equalize the width and keep up the levels, &c. and from all these causes combined, it will also save much in the wear and tear of the engines and the running gear of the cars, &c.

Frosty countries may be supposed to be an objection to the system when the earth is raised so as to touch the iron track rails and the chairs; but the superior conduction that iron has for cold as well as for heat when compared with earth, stone or wood, will cause an early concentration of frost about the iron, which will crowd off the earth before it is frozen and thus afford room for the expansion of the earth by crushing the frost without injury to the road.

In southern climates there can be nothing of the kind to fear, neither can there be a better superstructure for a road, as it will cost less than many kinds now made, that will not last a quarter as long.

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

The combination of the wooden foundation string pieces (*a*, *a*) immersed in the earth, with the iron chairs and track rails in contact with zinc or without zinc as set forth in the specification; not however intending to confine myself to the exact size, forms or distances in the several parts therein described or set forth; they being used as a near approximation to what experience shall require and for facility of description.

JAMES STIMPSON.

Witnesses:

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J. M. STIMPSON.