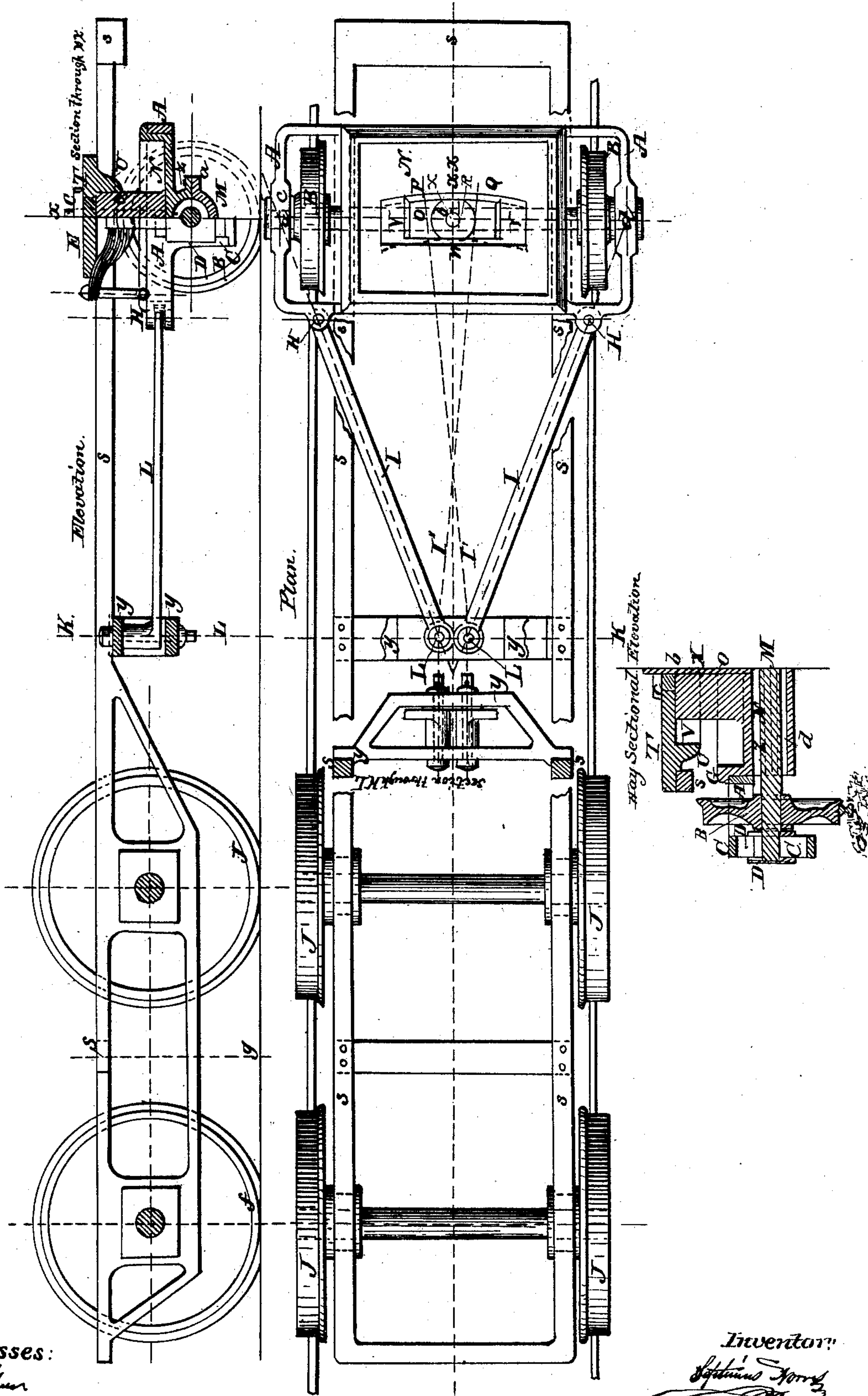


S. NORRIS.

Car Truck.

No. 28,007.

Patented Apr. 24, 1860.



Witnesses:
Edw. L. Linn
Wm. L. Linn

Inventor:
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UNITED STATES PATENT OFFICE.

SEPTIMUS NORRIS, OF PHILADELPHIA, PENNSYLVANIA.

GUIDE-WHEEL FOR LOCOMOTIVES.

Specification of Letters Patent No. 28,007, dated April 24, 1860.

To all whom it may concern:

Be it known that I, SEPTIMUS NORRIS, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and improved mode in the application and arrangement of a single pair of guide-wheels for locomotive-engines, which I denominate "Norris duplex radial truck" for locomotives; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The nature of my invention consists in a new mode of applying a single pair of guide wheels to a locomotive, by which the locomotive is enabled to pass, or traverse through curves of short radius, relieving the flanges of the driving wheels of friction and impingement against the inner sides of the rail.

I construct my frame with the iron placed on its edge as shown at A, Fig. 1, which frame surrounds the 2, guide wheels, B, B, the frame A, having pedestals for the journals of the wheels to play in as usual. I also weld or bolt 2, inside cross bars G, G, likewise placed on edge, which forms an additional stay. At the back end of the frame A, I attach by joints and bolts H, H, two radial bars I, I, the back centers of which are found in the line K, L, which is determined by measuring from the line S, (which is equi-distant from the centers of the driving wheels J, J,) one-half the distance between the said line *g*, and the centers of the front guide wheels B, B. The horizontal centers of these two radial bars I place near to each other as shown at L, L. When constructing my arrangement for a road with curves of large radius I would separate these centers horizontally.

The front joints and centers of the radial bars I, I, when they are attached to the frame A, at H, H, I determine by drawing a line from the back centers L, L, to a point passing through the center *d*, of the journal bearing, of the wheel, and in this line so found I place the front centers and joints of the radial bars I, I, at a convenient distance back of the frame A, so as to allow sufficient room for a joint and bolt. These centers and the back centers determine the lengths of the radial bars. The position of these centers I consider best but do not confine myself to them, as I could readily vary

them. These radial bars, are in a position and in the proper line of force, to direct and turn the frame and axle M, in the true radial position of the curve through which the locomotive is passing. This then will, at all times place the flanges of the guide wheels B, B, on a true tangential line to the curve.

Attached to the frame A, I place a casting N, having a central block O, extending upward, the top of which supports the front of the locomotive. This supporting block O, has its front vertical surface formed with two curved surfaces P, Q, meeting in the center R. These curves are described by a radius the center of which for the curve P, is at the back center of the radial bar I'. The center of the curve Q, is at the back center of the radial bar I''.

Between the frames *s, s*, of the locomotive I attach securely a casting T, which rests on and is supported by the block O, and upon which the casting T, moves. This casting T, has a lug V, projecting downward and around the block O, the front surface of the lug having a corresponding double curve like the front of the block O, against which the block O, moves. Spaces V, V, are left on either side of the block, so as to allow for lateral movement of the truck wheels and a space W, left at the back of the block to allow room when the truck is operating or moving out of its true central position.

The operation of the guide wheels when passing a curve, is to move themselves together with the block O, in a lateral position, the axle M, maintaining a true radial position to the curve, and working upon the compound curves of the block O, against the corresponding curves of the lugs of the casting T, either to the right or to the left as the curve of the rail may define. In addition to this compound curved block O, I fasten a pin in the middle of the block O, projecting upward and passing through the casting T. On this pin X, I place a friction roller *b*, of any suitable diameter having the same thickness as the casting T, making a slot in the casting T, corresponding with the curves described from the back centers of the radial bars I, I, the width of the slot being equal to the diameter of the friction roller *b*, its length equal to the distance between the lugs V, on the casting T. On the top of casting T, I place a washer *c*, around the bolt or pin X, of greater diam-

eter than the roller *b*, secured by a key in the usual way. This acts as a confining pin, and at the same time the roller *b*, admits of the easy lateral motion of the truck.

5 The back centers of the radial bars *I, I*, are held in their true position by means of bolts, &c., passing through a double cross brace *y*, which is attached and made fast to the frames *s, s*, of the locomotive.

10 I am well aware that Letters Patent were granted to Levi Bissell for application of a single pair of guide wheels to a locomotive but his arrangement is by means of a stiff and rigid *V* bar made fast to his frame, 15 with only one center back of the axle (I using jointed bars not rigid having 4 centers) and by Bissell's arrangement of inclined surfaces being horizontal and laterally across the framing, it is necessary in its 20 operation while passing curves to raise the entire weight of the front of the locomotive up these inclined blocks, before the wheel can move laterally, which I consider a very serious objection.

25 My arrangement is constructed truly mathematically having 2. back centers and 2. front centers, working upon true curves on the block *O*, and against the lugs *V*. By the use of the double curved block *O*, the 30 wheels *B, B*, are held more firmly and se-

curely when passing over a straight line of rail, caused by the apex formed by the junction of the 2. curves, which will hold the axis of the wheels *B, B*, in the true right angle position to the rails when on a straight 35 line of rail. I would remark, this same arrangement of radial bars can be applied to a truck with 4. guide wheels, but I consider 2. wheels better and more simple; it could also be applied to feeders, cars &c., &c., either 40 with 2. or 4. wheels.

Having fully described my improvement I now proceed to state my claims for invention with the understanding that I do not 45 claim the use of 2. guide wheels to a locomotive.

What I claim as my invention and wish to secure by Letters Patent, is as follows:

1. I claim the application of 2. radial bars jointed to the frame of the guide wheels and 50 working with four centers.

2. I claim the compound curved block in connection with the roller for supporting and guiding the wheels through curves, at the same time holding them rigid on a 55 straight line of rail.

SEPTIMUS NORRIS.

Witnesses:

EDW. HERR,

WILLIAM GEO. NORRIS.