

R. R. DOAN.
Road-Engines.

No. 158,923.

Patented Jan. 19, 1875.

Fig. 1.

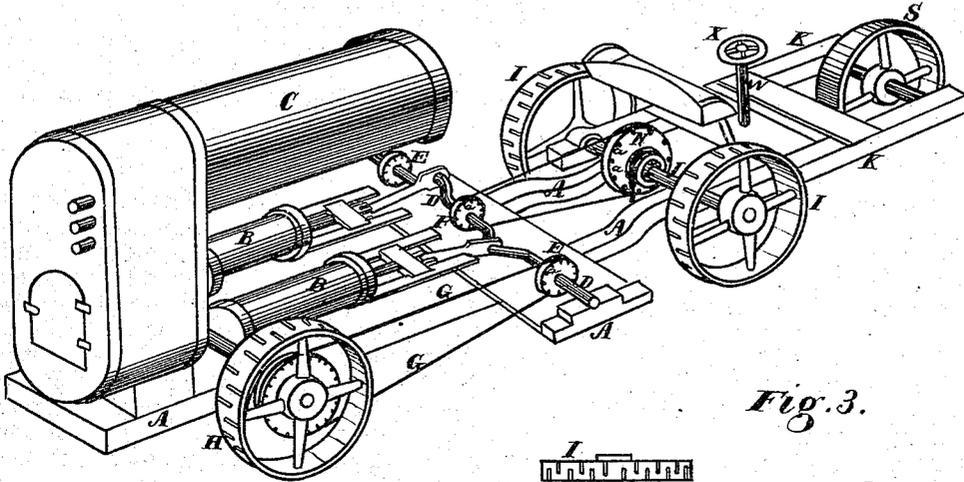


Fig. 2.

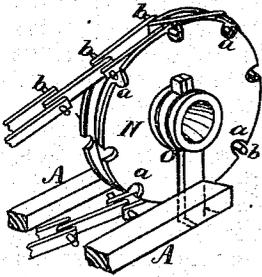


Fig. 3.

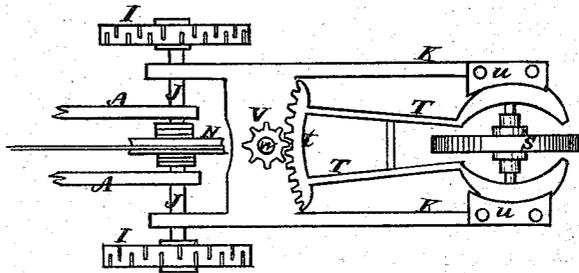


Fig. 4.



Fig. 5.

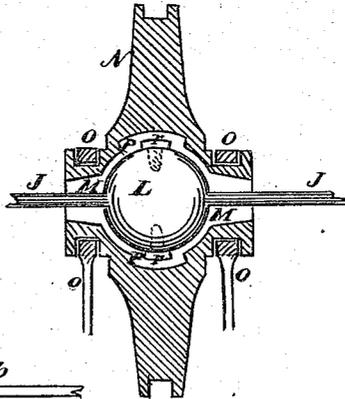
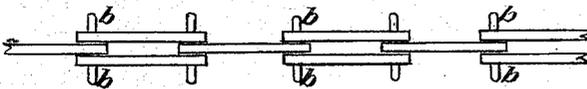


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

RILEY R. DOAN, OF SACRAMENTO, CALIFORNIA.

IMPROVEMENT IN ROAD-ENGINES.

Specification forming part of Letters Patent No. **158,923**, dated January 19, 1875; application filed January 2, 1875.

To all whom it may concern:

Be it known that I, RILEY R. DOAN, of Sacramento city and county, State of California, have invented a Road-Engine; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention without further invention or experiment.

My invention relates to certain improvements in that class of machines known as road-engines; and it consists in so connecting the engine-bearing portion of the machine with the front or steering part that the driving-belt wheel upon the latter will always remain in the proper position to receive the belt from the former, whatever angle and direction may be given to the machine. The chains and wheels for receiving and imparting motion from the engine are also of novel construction.

Referring to the accompanying drawing for a more complete explanation of my invention, Figure 1 is a perspective view of my machine. Fig. 2 is an enlarged view of a driving-pulley. Fig. 3 is a plan view of the steering device. Figs. 4 and 5 are views of the universal joint. Fig. 6 is a view of the driving-chain.

A is the frame, upon which the engine B and boiler C of the machine are supported. The engine-shaft D extends across this frame near the front end, and is provided with driving-pulleys E and F. From the two pulleys, E, near the ends of this shaft, chains G extend to pulleys upon the axle of the bearing-wheels H, which support the rear portion of the machine. The wheels I, which support the front end of the machine, have a shaft or axle, J, which extends across an independent frame, K, and bears in boxes upon this frame. A ball, L, is turned smoothly, and is securely fixed to this shaft at its center. A metal socket, M, which is fitted into the center of the driving-pulley N, surrounds this ball, and has openings at each side of the pulley, of such a size as to allow the free play of the axle J, so that it may stand a considerable angle from a right angle to the pulley, if necessary. The pulley has a short hub at each side, and around this hub are secured the straps O O, within which

the hub revolves. These straps are secured strongly to the frame A below, and thus this pulley N is held with its face always parallel with that of its driver F, while all variations of movement from irregularities of the ground, or by reason of turning, are permitted to the shaft or axle J by the ball and socket within the pulleys; and thus I am enabled to employ the forward traction-wheels, I, and make them equally effective with the rear wheels, H, however they may be turned. In order to connect the socket with the ball, so that, while a free motion is possible, the pulley will still turn and control the ball, and through it the shaft, I make four grooves, P, within the socket, extending almost around it in the direction from one opening to the other, and transversely with the wheel. Upon the outside of the ball I make four projections, r r, which are fitted to travel in these grooves, and thus, whatever may be the angle of the pulley and shaft, the former can act upon the latter through the medium of these grooves and projections. I prefer to make the projections in the form of screws, with long heads standing parallel with the axle J, and these heads are curved, so as not to bind in the grooves when the shaft happens to turn to any angle with the pulley. The front end of the independent frame K is supported upon the steering-wheel S, the shaft of which turns in boxes upon the movable frame T. This frame has its front end curved into arcs of circles upon each side of the wheel, and the center of the wheel is also the center of motion of the arc. Two segments, U, are secured to the end of the front timber of the frame K, and these segments are grooved to receive the arms, so that, by turning the frame T, the wheel S can be turned from side to side. The rear end of the frame T is formed into a segment-rack, t, having teeth upon its outer edge, into which the pinion V meshes. This pinion is secured to the lower end of a vertical spindle, w, having a hand-wheel, X, upon the top, and by this means the steersman can guide the machine in any direction, while by means of the universal joint within the pulley N the driving-chain will always be kept to its full bearing and effectiveness.

In order to most perfectly transmit the power of the engine by means of chains, I construct

my driving-wheels with a groove around the periphery, into which the chain can lie. Transverse grooves or slots *a* are made in the rim of the wheel to receive the cross-bars or drivers *b* from the chain. My chain is constructed of bar-links *c c d*, as shown, and they are secured together by the pins *b*, the ends of which extend so far on each side as to allow them to lie in the slots or grooves *a* in the wheel-rims.

By this construction I am enabled to drive the different parts, by means of the chains, with no danger of their slipping, and this, together with the universal-joint pulley, enables me to use two pairs of traction and bearing wheels without interfering with the facility of movement of the machine.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of pulley *N*, having rigid bearings and slotted socket *M*, with shaft *J*, ball *L*, and projections *r r*, substantially as set forth.

2. A traction-engine, in combination with the four traction and bearing wheels *H* and *I* and universal joint, consisting of socket *M* and ball *L*, with projections *r r*, so that wheels *I* can exert their tractive power when turned to an angle with the wheel *H*, substantially as set forth.

In witness whereof I hereunto set my hand and seal.

RILEY ROBISON DOAN. [L. s.]

Witnesses:

JNO. L. BOONE,

C. M. RICHARDSON.