(No Model.) 2 Sheets—Sheet 1.

J. DONOVAN.

RAILROAD VELOCIPEDE.

No. 551,623. Patented Dec. 17, 1895.

Fig. 1.

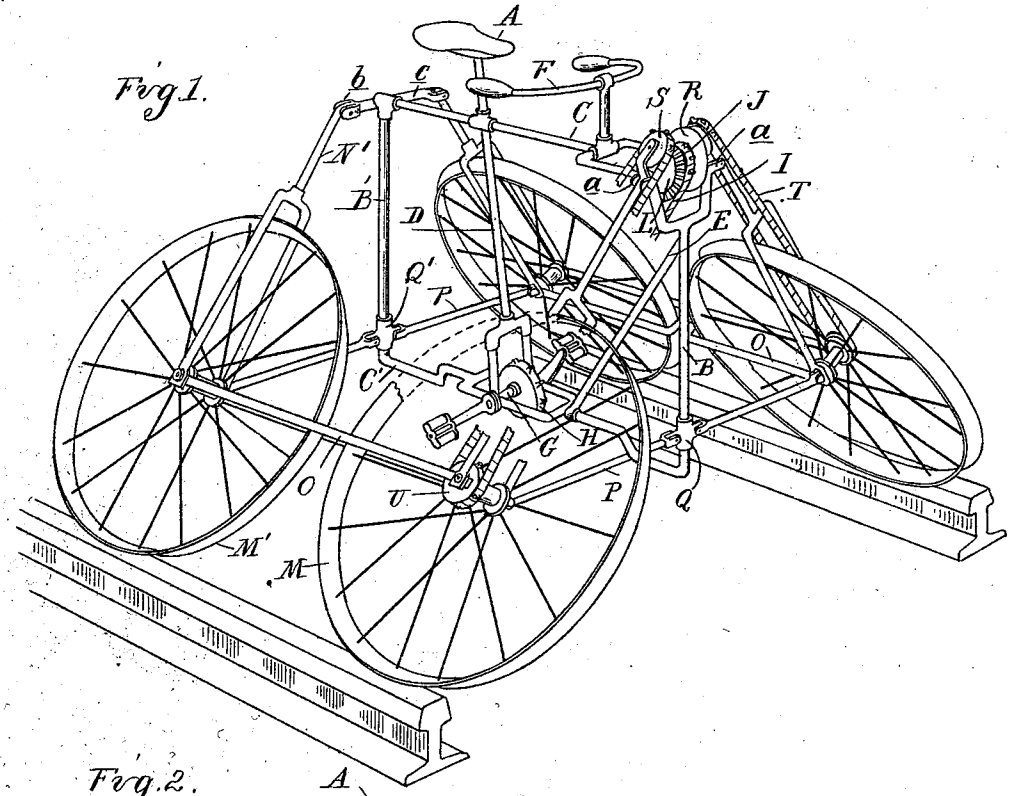
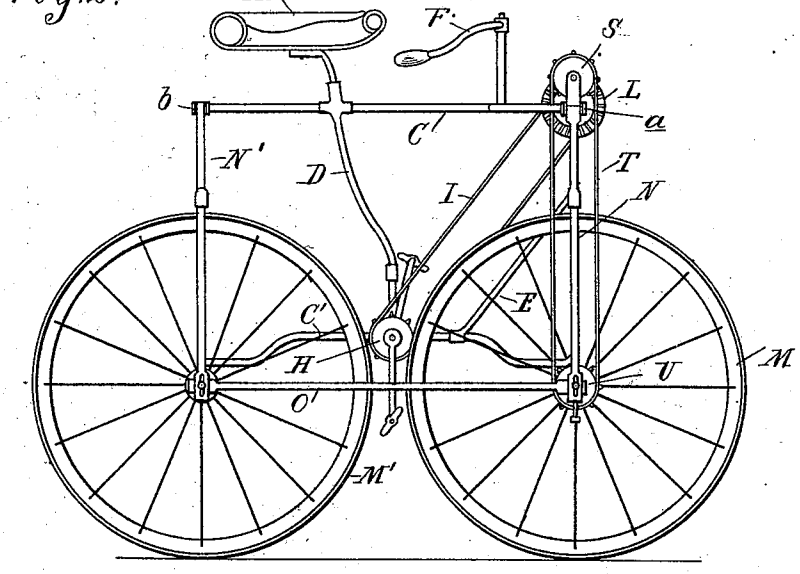


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

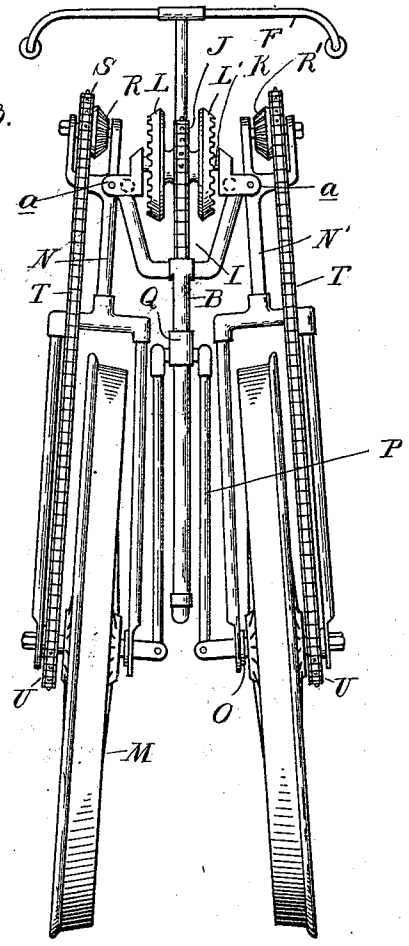


Fig. 4.

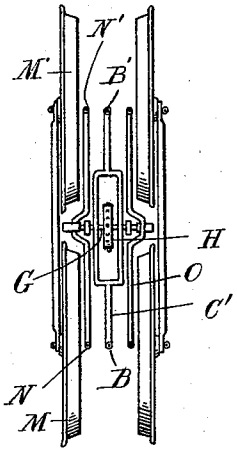


Fig. 5.

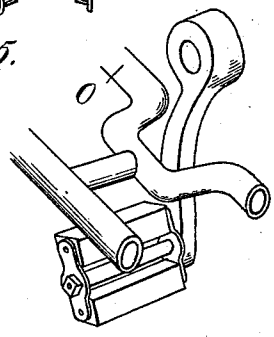
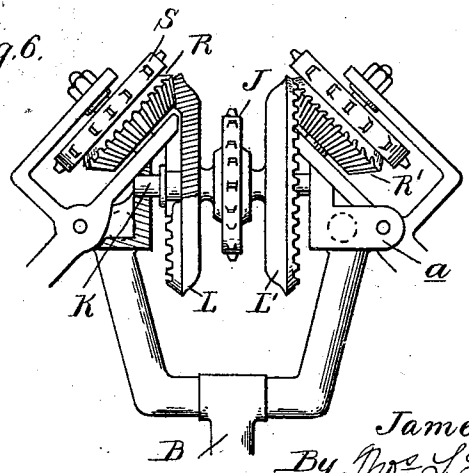


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES DONOVAN, OF THREE RIVERS, MICHIGAN, ASSIGNOR TO THE ROBERTS, THROP & COMPANY, OF SAME PLACE.

RAILROAD-VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 551,623, dated December 17, 1895.

Application filed June 10, 1895. Serial No. 552,270. (No model.)

To all whom it may concern:

Be it known that I, JAMES DONOVAN, a citizen of the United States, residing at Three Rivers, in the county of St. Joseph and State of Michigan, have invented certain new and useful Improvements in Railroad-Velocipedes, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention embodies a new type of railroad-velocipede which is mainly characterized by having a vertical main frame which carries the rider and pedal-movement and is supported upon the rails centrally of the track by two like folding outrigger wheel-frames, each provided with two diagonally-inclined wheels, one wheel of each being a drive-wheel, all so arranged that the outrigger and main frames may be folded into parallelism with each other, or nearly so, all as more fully hereinafter described in connection with the accompanying drawings, in which—

Figure 1 is a perspective view of my improved railroad-bicycle as in use. Fig. 2 is a side elevation thereof in its folded condition. Fig. 3 is a front elevation thereof in its folded condition. Fig. 4 is a diagram plan thereof in its folded condition. Fig. 5 is a perspective view of that portion of the outrigger-frames which folds against the foot-cranks, and Fig. 6 is an enlarged detail view showing a part of the propelling-gear in front elevation.

All the parts of the frame are preferably composed of tubing and constructed according to the principles used in the construction of bicycles and similar vehicles in which lightness and strength are to be combined.

The operator is supported upon a saddle A mounted upon a vertical main supporting-frame, which is composed of the vertical front and rear standards B B′ connected into a rigid frame by means of suitable other members, such as the horizontal top and bottom members C C′, the saddle-post D, and brace E. In front of the saddle A is also preferably mounted a false steering-handle F in imitation of the usual steering-handle of the bicycle, but in this case merely intended as a convenient support for the rider. This main frame carries a part of the drive-gear, which consists of the drive-shaft G journaled in the frame in suitable relation to the seat, to be actuated by foot-power applied through the usual crank and pedal device. Centrally of the drive-shaft is mounted in a suitable slot formed in the frame the sprocket drive-wheel H, over which passes an endless chain I onto a sprocket-wheel J, supported in the upper front corner of the main frame. To this end a suitable slot is formed in the front upper corner of the main frame, such as by means of forking the adjacent ends of the standard B and of the horizontal member C, as shown in the drawings. In the slot thus formed the shaft K is mounted upon which the sprocket-wheel J is journaled. The latter is rigidly connected with two bevel drive-pinions L L′, located on opposite sides of the sprocket-pinion J for the purpose of communicating motion to the drive-wheels, as more fully hereinafter described.

To the main frame of the machine are connected on opposite sides two folding outrigger wheel-frames, each of which carries two inclined supporting-wheels M M′. Each of these outrigger-frames is composed of the front and rear forks N N′. The wheels M M′ are journaled in the forks which are rigidly connected by suitable horizontal members O. The upper ends of the forks N N′ are pivotally connected to the main frame near the upper end of the front and rear standards thereof. To this end suitable ears *a a* are formed on opposite sides of the forked front corner of the main frame to which the upper ends of the front forks N are pivotally connected and in like manner ears *b* are formed upon the ends of a short cross-bar *c* at the rear upper corner of the main frame for the pivotal connection of the rear forks M′ in line with the front pivotal connections. These outrigger-frames and their wheels are supported, diagonally inclined, against the rails on opposite sides of the main frame by means of transverse braces P arranged in pairs between the axles of the front and rear wheels and pivotally connecting the outrigger-frames with sliding ferrules Q Q′ sleeved upon the front and rear standards B B′, all in such manner that when the braces P P are extended, as shown in Fig. 1, the wheels travel on the

inner corners of the rails and rigidly support the main frame centrally between them, while at the same time by sliding up the sleeves Q Q′ upon the standards B B′ the outrigger frames and wheels can be folded into parallelism, or nearly so, with the main frame.

The wheels M M′, which are preferably made of like size, are provided with suitable flanged tires which freely roll in contact with the inner corners of the rails and they are preferably encircled with a rubber band to deaden the noise on the rails.

For the purpose of communicating the power to the front drive-wheels the upper ends of the front forks N extend upwardly beyond the pivotal point and form suitable bearings for the bevel gear-wheels R R′, arranged in such relation to the bevel gear-wheels L as to intermesh therewith when the outrigger-frames are extended, as in Figs. 1 and 6. The bevel-wheels R are connected with sprocket-wheels S placed on the same shaft, and by means of endless chains T motion is conveyed to sprocket-wheels U carried by the front wheels M.

My invention is principally designed to make a railroad-velocipede from which a maximum of speed may be obtained with the utmost safety to the operator. Its construction combines strength with lightness, and by inclining the wheels at about an angle of forty-five degrees more or less it will be seen that there is a minimum of frictional contact, as the smoothest part of the rail is utilized and the position of the driver in the center between the rails insures his perfect safety at any degree of speed in going around curves.

A further advantage of the construction is that the device may be instantly removed from the rails at the approach of danger, as by canting up the machine upon one of the rails and assisting the braces to fold, the machine will instantly collapse and in this condition can be readily handled by the operator.

For the use of track-inspection the small space in which it can be stored and transported is also an advantage and from its collapsed condition it can be readily again placed upon the rails by extending the braces.

In folding, the gear-wheels R L are thrown out of engagement and the foot-cranks may be locked by forming suitable bends in the member O, as shown in Fig. 5.

The object of my construction is to gain the greatest amount of stability with the least amount of weight as one of the primary conditions for making a high-speed vehicle. This question of stability is of paramount importance for the reason that there are but few railroad-tracks without frequent curves. This question of stability excludes at once from consideration all such constructions in which the operator is placed directly above or near one of the track-rails, and makes it essential that the center of gravity should be in the vertical center between the rails and the nearer it is to the ground and the more the weight is all concentrated at or near the center the greater will be the stability and the less weight will be required to keep the vehicle on the track in going around curves at high speed. With my construction in which the operator is supported on a central vertical frame the same as on a bicycle (in contradistinction with the horizontal platform) and maintained in traveling contact centrally between the rails, by means of diagonal wheel-frames, the greatest amount of stability is obtained over all other constructions relatively to the amount of weight required. The folding feature is based upon the consideration of increasing the transportability of the device in the baggage-car or on the ground and facilitating its easy removal and replacing it on the rails, and on this account alone my construction is of great advantage.

What I claim as my invention is—

1. In a railroad velocipede, the combination of a vertical main frame supporting the operator and diagonal wheel frames supporting said vertical main frame centrally of the track, in traveling contact with the rails, substantially as described.

2. In a railroad velocipede, the combination of a vertical main frame supporting the operator, diagonal wheel frames supporting said vertical frame centrally of the track, in traveling contact with the rails by means of front and rear wheels independently journaled in said wheel frames, a drive shaft provided with foot cranks supported upon the vertical main frame and intermediate gearing between said shaft and the front wheel of each wheel frame, substantially as described.

3. In a railroad velocipede, the combination of a vertical main frame supporting the operator and diagonal wheel frames on opposite sides thereof supporting said vertical frame centrally of the track, in traveling contact with the rails by means of similarly inclined front and rear wheels journaled in said wheel frames, said wheel frames having folding connections with the main frame, substantially as described.

4. In a railroad velocipede, the combination of a vertical main frame supporting the operator and having vertical front and rear standards, diagonal wheel frames pivotally secured to said main frame on opposite sides and supporting the main frame, in traveling contact with the rails and folding braces transversely connecting the wheel frames below their pivotal connections with the main frame, substantially as described.

5. In a railroad velocipede, the combination of a vertical main frame supporting the operator, diagonal wheel frames pivotally secured on opposite sides of said main frame and supporting the same, in traveling contact with the rails centrally of the track by means of front and rear wheels independently journaled in said wheel frames and folding braces transversely connecting the inner ends of the axles of said wheel, substantially as described.

6. In a railroad velocipede, the combination of a rigid vertical main frame having vertical front and rear standards, the diagonal wheel frames pivotally connected to the main frame, and provided with inclined front and rear wheels journaled upon shafts secured in said wheel frames, sliding sleeves upon the standards of the main frame, and folding braces pivotally connecting the shafts of the front and rear wheels with the sliding sleeves, substantially as described.

7. In a railroad velocipede, the combination of a rigid vertical main frame carrying the seat and the foot cranks, diagonal wheel frames pivotally secured to the main frame and provided with independently revolving front and rear wheels supporting the main frame in traveling contact with the inner corners of the rails centrally of the track, folding braces transversely connecting the main frame with the diagonal wheel frames, and a drive gear connection from the foot cranks to the front wheels of the wheel frames and comprising the intermeshing bevel pinions L L′, R R′, carried upon proximate parts of the main and wheel frames, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES DONOVAN.

Witnesses:
JAMES E. BUNN,
JAMES B. ROBERTS.