No. 611,808. Patented Oct. 4, 1898.

J. DONOVAN.

RAILWAY VELOCIPEDE.

(Application filed Nov. 22, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 5.

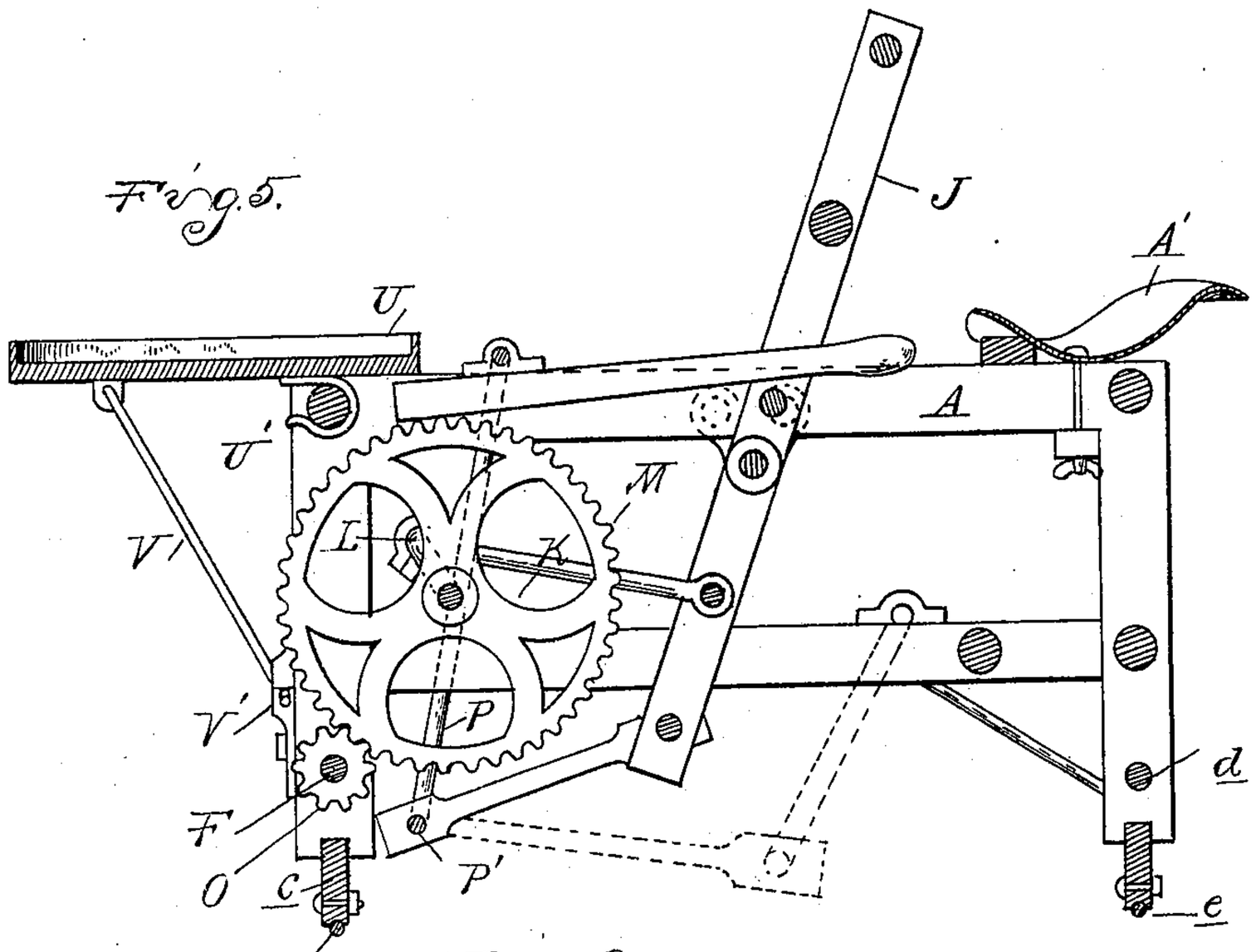

Fig. 6.

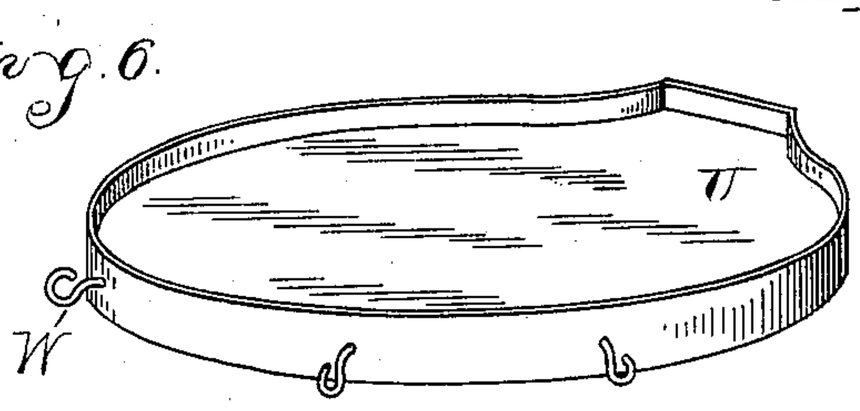

Fig. 1.

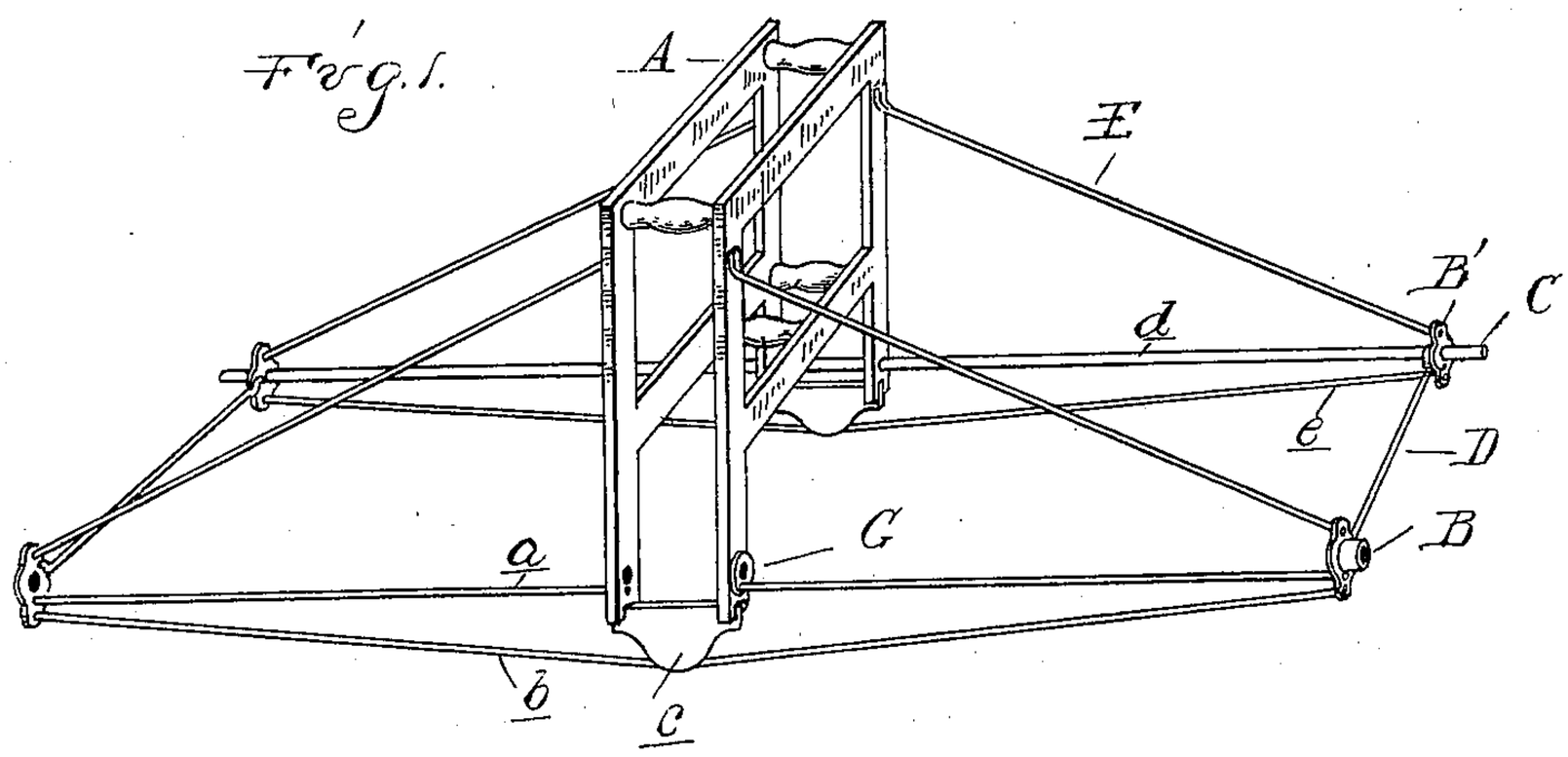

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Fig. 2.

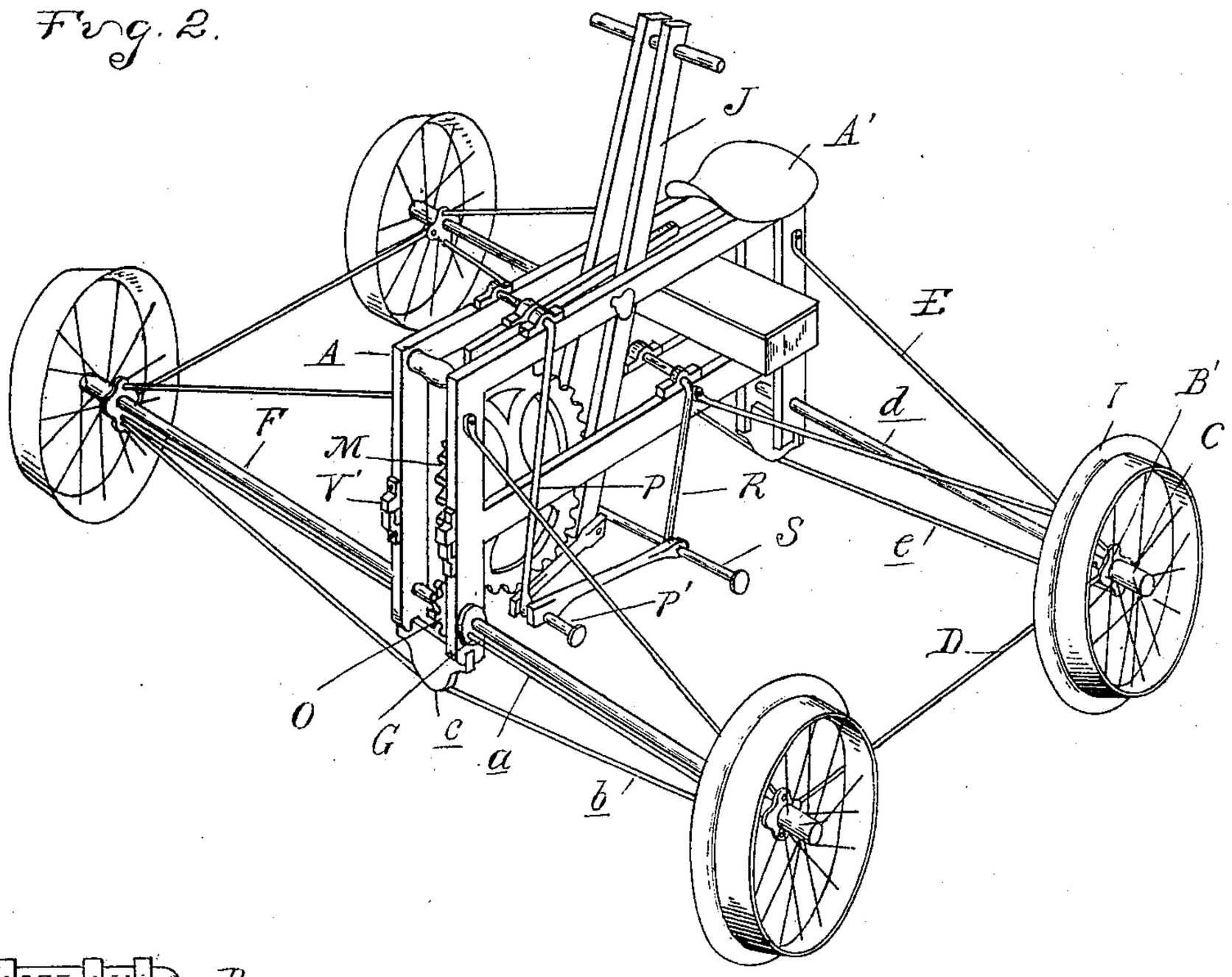


Fig. 3.

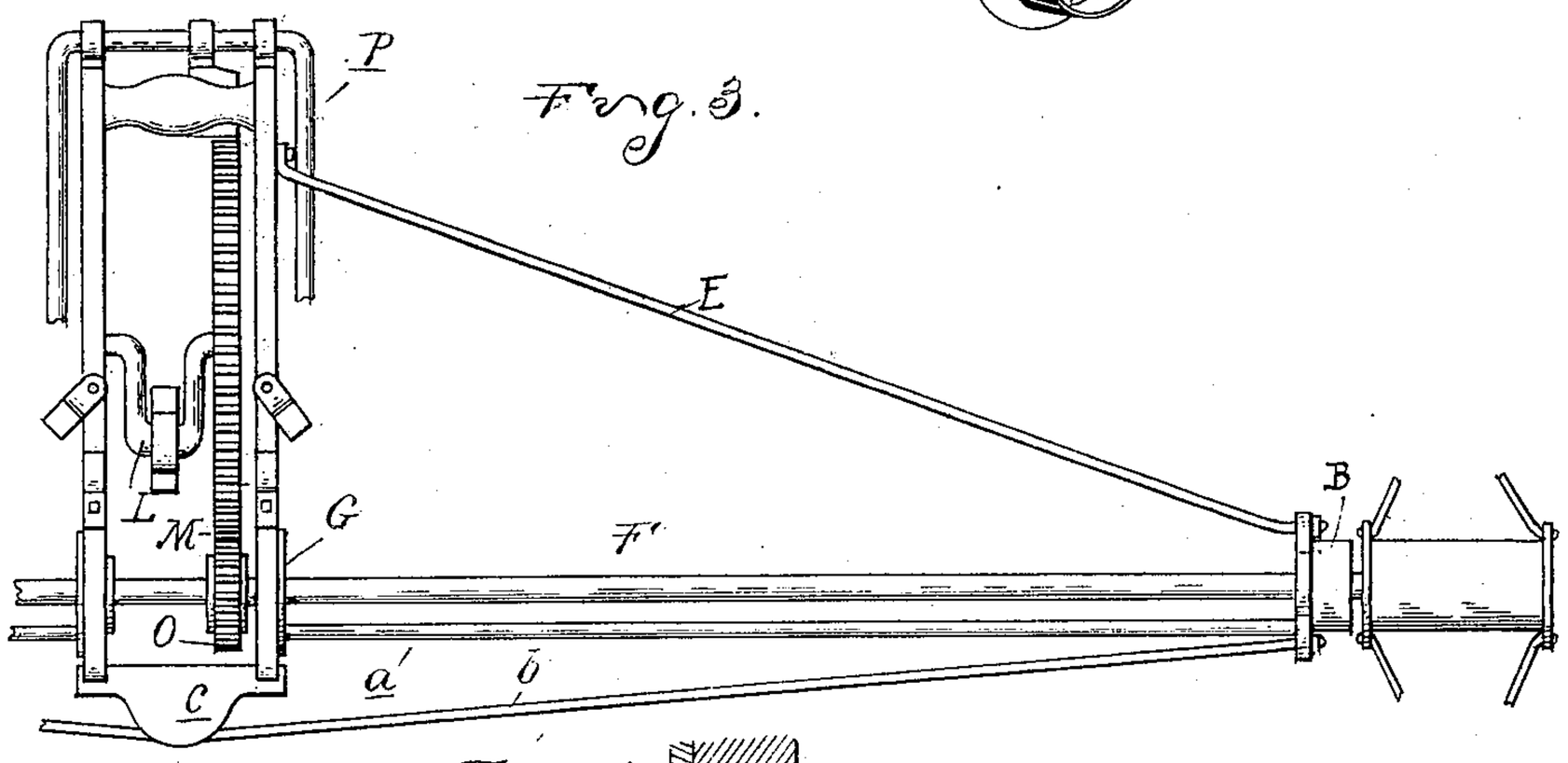
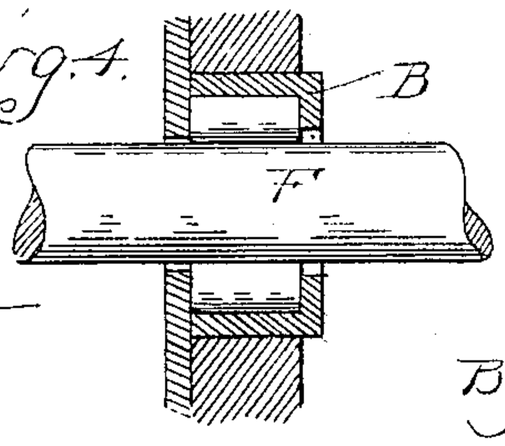


Fig. 4.



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UNITED STATES PATENT OFFICE.

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

RAILWAY-VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 611,808, dated October 4, 1898.

Application filed November 22, 1897. Serial No. 659,492. (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 Railway-Velocipedes, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of a railway-velocipede, and particularly in the following means: first, in the construction of a frame comprising a rigid seat-frame with laterally-extending trusses at opposite ends and which support the axles upon which the wheels are carried; second, in the construction of the drive-axle and its drive mechanism.

In the drawings, Figure 1 is a perspective view of the frame without its drive mechanism and with the diagonal braces omitted. Fig. 2 is a perspective view of the entire machine. Fig. 3 is an enlarged front elevation of a portion of the forward end of the frame. Fig. 4 is a detail section illustrating the construction of the roller-bearing. Fig. 5 is a vertical central longitudinal section. Fig. 6 is a detached perspective of the lamp shelf and bracket.

In the prior state of the art it has been usual to make velocipede-cars with three wheels, comprising a frame supported upon two wheels and adapted to run over one rail and an outrigger extending from the frame to the other track, upon which the third wheel runs. The objection to this form of device is that the center of gravity is so near the one side that going around curves accidents frequently occur. My device overcomes this objection by having the seat-support in the middle and employing four wheels. Prior to my construction there have been a number of patents showing four-wheeled velocipede-cars; but so far as I am aware they have not embodied the construction of frame and the other points of construction which are herein described and which overcome the objections heretofore existing to such four-wheeled velocipede-cars for railroad use and which makes a light, strong, and durable device.

The frame of the velocipede is shown in Fig. 1 and consists of a seat-frame A, which is a rigid frame complete in itself and carries at one end a suitable seat A′ for the operator. At the forward end of this frame is a truss comprising the compression member *a* and the tension member *b* and the strut *c*. At the end of this truss are the boxes B. The compression member *a* extends, preferably, only to the seat-frame, and the intermediate compression strain is taken up by the strut *c*, this being simply for the purpose of making room for the pinion of the drive-axle, as will hereinafter appear.

At the rear end of the frame is a transverse truss comprising the compression member *d* and the tension member *e*, with a suitable strut in the middle. This likewise has brackets B′, which have the same relation to the frame as the boxes B have to the forward struts.

C are stub-axles projecting from the ends of the rear truss. These stub-axles are preferably formed by a continuation of the compression member *d*. They may be made in separate pieces, if desired.

The parts B B′ are tied together by the tie-rods D.

E are inclined braces extending from the outer ends of the transverse trusses to the upper parts of the seat-frame.

The parts thus far described form the frame, which, it will be seen, may be light and strong and which gives ample room beside the seat-frame for the operator to stand in lifting and handling the velocipede on or off the track. It will also be seen that this frame is entirely independent of the drive-axle as a structural member or part thereof.

The drive-axle F is journaled in bearings G in the two vertical members of the seat-frame and near its ends is journaled in the bearing B. This bearing is preferably a roller-bearing of the construction shown in Fig. 4, and the axle has a sliding movement therein, or what is commonly called an "end shuck." This end sliding movement may be limited by any suitable stops. I preferably limit the end movement by the wheels contacting the ends of the trusses. The object of this limited end play of the axle is to allow the front and rear wheels to assume a proper

relation to each other in getting around curves, over switches, &c., without undue binding of the wheel-flanges on the rail.

The rear wheels I are journaled on the stub-axles already referred to, and the bearings may be ball or roller bearing, as desired, for both sets of wheels.

The actuating mechanism consists of the rocking levers J, extending substantially vertical in the seat-frame and in proper relation to the seat, so that the operator may rock the same back and forth. The lower end of this lever is connected by the connecting-rod K with a crank L and a crank-shaft journaled in the seat-frame. On this crank-shaft is a gear-wheel M, which meshes with the pinion O on the drive-axle between the vertical members of the seat-frame, or, if desired, it may be adjacent thereto. The object of this is to prevent any bending of the axle because of the thrust of the drive mechanism. The foot of the lever J is connected to the links P, which are supported in bearings in the seat-frame and the lower ends of these links are connected by the cross-bar P′, which forms a rest for the foot of the operator, so that he may assist by pushing by his feet as well as by pulling and pushing with his hands in propelling the car.

R are links in rear of the oscillating lever J, connected by a foot-bar S, which may be used for the feet of an operator sitting on the front of the frame in case it is desired to use it as a two-man car. This is easily done, as the oscillating-lever is in the middle of the seat-frame, so that a man sitting at either end thereof can grasp it and apply power thereto.

For convenience in carrying lamps I employ a shelf or platform U, detachably secured to the front of the seat-frame. The means which I have shown for detachably securing it in position are the hooks U′ and the brace-rods V, supported by the brackets V′ on the front of the frame, as plainly shown in Fig. 2. This platform overhangs the seat-frame, and is provided around its edges with suitable hooks W, on which lanterns may be hung and may swing more or less without striking the frame. They may also be stood upon the top of the platform U, if desired, or other articles may be carried thereon.

What I claim as my invention is—

1. In a railroad-velocipede, a frame comprising a longitudinally-arranged vertical seat-frame, a transverse truss at each end of said seat-frame comprising a strut projecting downwardly from the seat-frame, a bracket at each end, a tension member secured to said brackets and bearing on said strut, and compression members secured to said bracket and to the seat-frame, braces connected to the outer ends of said trusses and to the upper portion of said seat-frame, and tie-rods connecting the outer ends of said trusses.

2. In a railway-velocipede, the combination of a frame comprising a longitudinally-arranged vertical seat-frame, a transverse truss at each end of said seat-frame, consisting of a strut projecting downwardly from said seat-frame, a bracket at each end, a tension member secured to said brackets and bearing on said strut, and compression members secured to said seat-frame and to said brackets, a drive-axle journaled in bearings formed in said brackets, of one truss, axles projecting from the brackets of the other truss, wheels on said axles, brace-rods connecting said brackets with the upper portion of said seat-frame, tie-rods connecting the said brackets, and propelling means on said frame for operating said drive-axle.

3. In a railway-velocipede, the combination of a longitudinally-arranged vertical seat-frame, a transverse truss at each end of said seat-frame, a drive-axle journaled in bearings carried by one of said trusses, an axle constituting one member of the other truss, wheels on said axles, and propelling means.

4. In a railroad-velocipede, the combination with the seat-frame, a rocking lever pivoted thereon, a crank-shaft, a connection from the lower end of the rocking lever to said crank-shaft, a drive-axle, gear connection from the crank-shaft to the drive-axle, links pivoted to the seat-frame at one side of the rocking lever, connections from the lower end of the links to the rocking lever, a foot-bar at the lower end of the links, a second pair of links at the opposite side of the rocking lever, connections between the two sets of links, and a foot-bar upon the second pair of links.

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

JAMES DONOVAN.

Witnesses:
S. HORACE ROBERTS,
JAMES B. ROBERTS.