

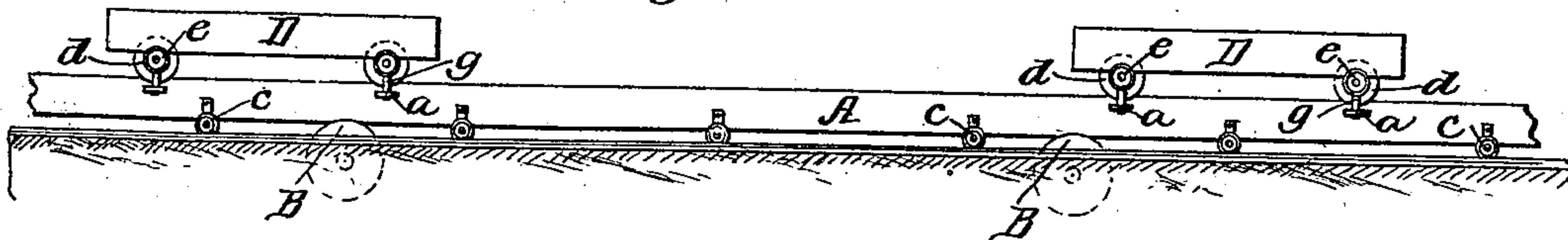
(No Model.)

H. DAY.  
RAILWAY.

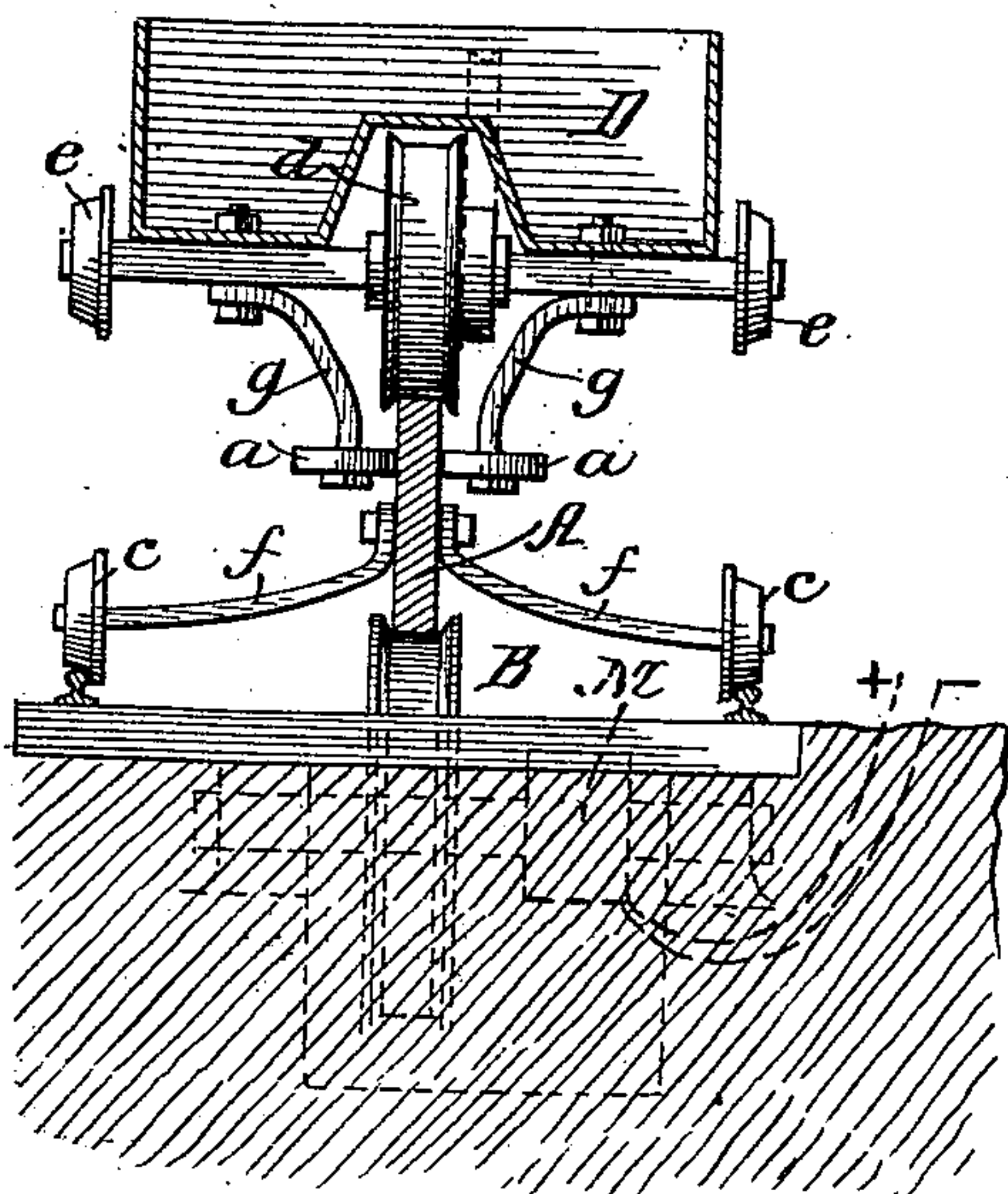
No. 464,455.

Patented Dec. 1, 1891.

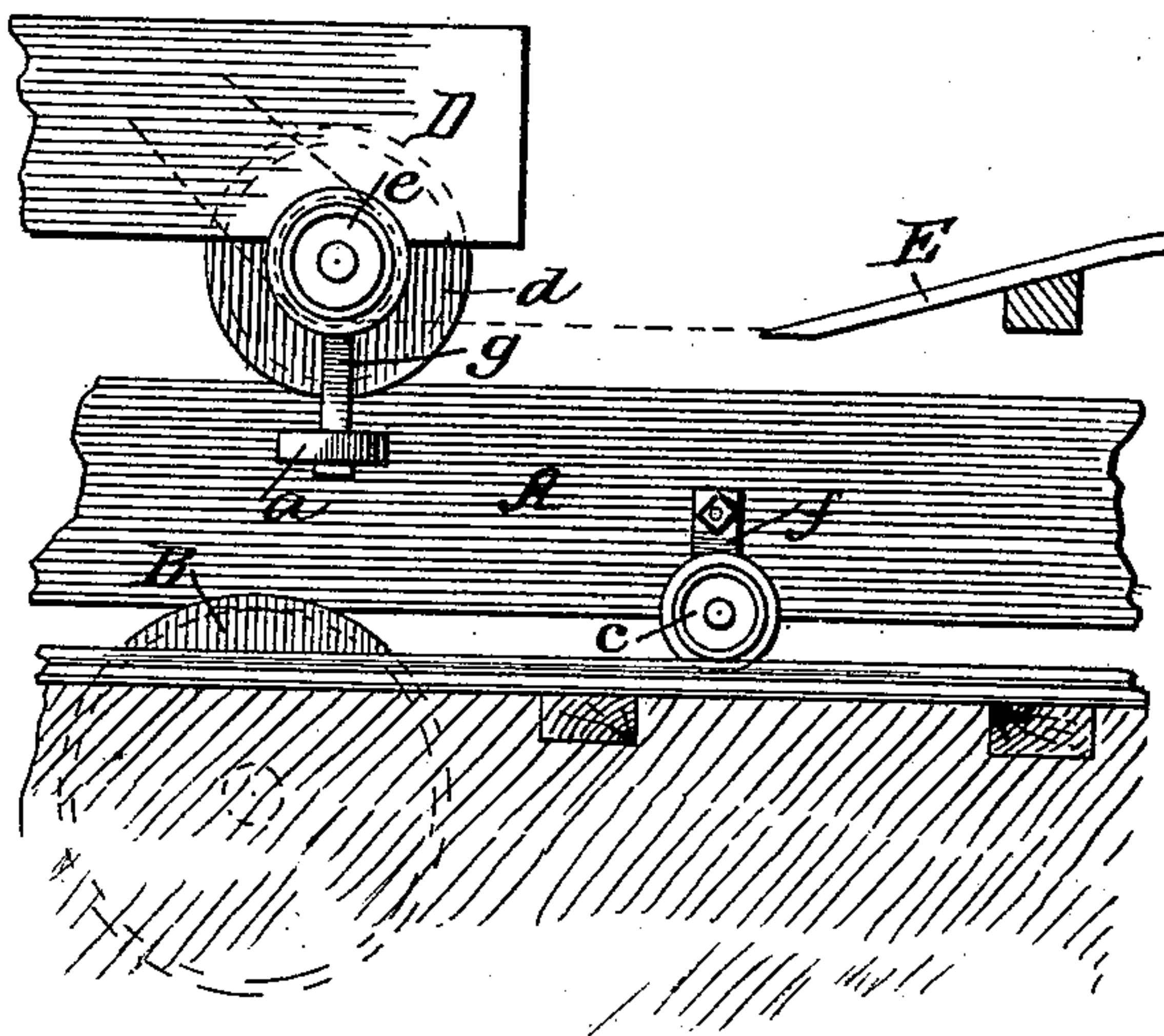
*Fig. 1.*



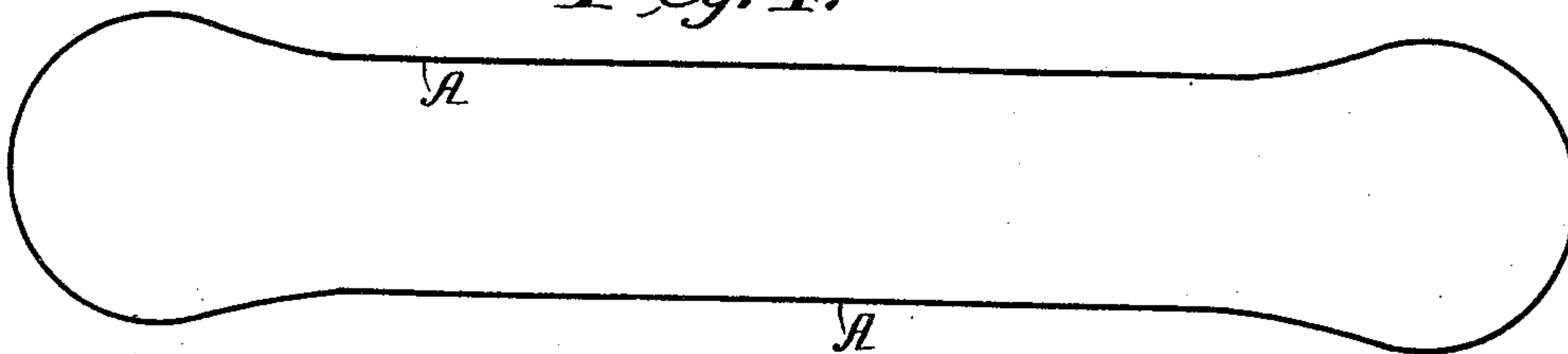
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

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## RAILWAY.

SPECIFICATION forming part of Letters Patent No. 464,455, dated December 1, 1891.

Application filed March 30, 1891. Serial No. 386,885. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY DAY, residing at Fairview, county of Bergen, and State of New Jersey, have invented a new and useful  
5 Improvement in Railways, of which the following is a specification.

My invention relates to a new system of constructing and operating railways for the purpose of combining or multiplying velocities and of avoiding the use of the dangerous,  
10 expensive, and cumbersome machines called "locomotive engines" and "tenders" as now used, and for obtaining the greatest advantages of safety and speed with continuous  
15 travel and frequent stopping, as may be desired, and also moving with lighter and safer cars and more frequent trains.

To these ends my invention consists in a flexible endless driven or traveling rail moving in a continuous manner and combined  
20 with cars sustained upon said moving rail by means of driving-wheels, whereby the cars partake of the speed of the rail and also have an independent propulsion of their own,  
25 which together multiplies or compounds the velocity of the car and secures the advantages above described.

Figure 1 is a side elevation of a section of my improved railway. Fig. 2 is a vertical  
30 cross section of the same on a larger scale. Fig. 3 is a partial side view of the same on the same scale as Fig. 2, and Fig. 4 is a plan of the circulating track in one of its forms.

A is one continuous endless flexible bar or  
35 rail, which is preferably made of steel, shaped in cross-section like a board set up edgewise and bending at the ends of its travel like a great steel belt, (with joints or articulations, if preferred,) as shown in Fig. 4. This rail  
40 or track may be made of any metal or material, and may be made, as desired, in larger or shorter lengths. This belt-rail may be made to move in the form of a loop in plan view, as in Fig. 4, or it may be a circle, ellipse, or of other form which runs into or  
45 returns into itself. It is made to circulate at any desired velocity by being sustained upon driving-wheels B, of any suitable diameter or width, flanged at the sides to keep it from  
50 slipping off, which driving-wheels are placed along the line of its route. These driving-

wheels B may be driven by any motive power; but I prefer to drive them by electric motors M, Fig. 2, placed on the same shaft with the wheels and connected together along the line  
55 by electric conductors or wires by which power may be conveniently, economically, and efficiently distributed to all the driving-wheels B along the route. As the traveling rail A circulates or moves from the frictional  
60 driving-power of its supporting-wheels B, it is guided and held in true vertical position by guide-arms *f*, fastened to it upon opposite sides and provided at their extremities with traveling wheels *c c* running upon track-rails  
65 of any desired construction.

D D are cars of any approved material or form of construction adapted for the conveyance of freight, passengers, mails, or munitions of war. These cars are provided with  
70 one or more supporting and propelling wheels *d*, which are flanged and rest upon the upper edge of the traveling rail A. When only one propelling-wheel *d* is used, it is placed in the middle of the car and other supporting-wheels  
75 are placed at each end. When under motion, these cars will maintain their erect position by reason of the tendency of moving bodies to preserve their planes of motion; but to steady and guide this car when starting and  
80 stopping it is provided with arms or stays *g g*, reaching down from each side of its bottom and bearing at their lower extremities friction-rollers *a a*, which bear against the sides of the traveling rail A. For giving an inde-  
85 pendent propulsion to this car on the track A it is supplied with any desired motor, which is either placed upon the same axis with the drive-wheel *d* and is coupled directly to it or may be placed at any other point of the car  
90 and connected to the drive-wheel by pulley and belt or chain-wheel, as shown. For many reasons I prefer an electric storage-battery and motor located upon the car; but the electric current may be delivered to the motor on  
95 the car through a trolley and wire or through the rail A as a conductor.

Now it will be seen that when the rail A is traveling at a definite speed from its propelling and supporting wheels B it will carry  
100 with it the cars D, and as the cars D have still an independent means of propulsion on



the rail they have an independent progressive motion on the rail A, which causes their speed to be multiplied in a cumulative way that secures a very high velocity in a perfectly safe manner. I will now proceed to describe the means for stopping these cars at stations without interfering with the continuous through travel, and for this purpose the stationary axles of the wheel *d* are extended beyond the sides of the car and are provided with wheels *e e*, and at the stations are provided suitable inclined track-sections E, which may be moved laterally to or from alignment with the lower edges of the wheels *e e*. When thrown out into alignment with the wheels *e e*, the car runs upon these inclined and elevated sections of track, and a lateral motion is then provided for shifting this track-section and car out of line of rail A, so as to side-track any car without interfering with the continuous following through travel on the traveling rail A. To restore a car to the main rail A, the track-sections E are switched or moved laterally with the car until the wheel *d* of the latter is in line with the traveling rail, and the car is then allowed to run down the incline at the opposite end of the side track and renew its connections with the traveling rail A.

In operating such a system of railway very short curves for the traveling rail A may not be practicable; but with a gradual curve of long radius it will be found that a steel bar of suitable width and thickness, hinged, jointed, or otherwise, possesses sufficient pliancy for lateral deflection as to easily accommodate itself to the gradual bends of the route. At such bends or curves it is of course necessary to have stationary guide rollers or pulleys for guiding and controlling the curvature of the traveling rail.

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

1. A single moving endless flexible rail supported upon and driven by driving-wheels disposed along the route of the railway, in combination with devices for keeping said rail in

place upon the driving-wheels, said rails being adapted to carry wheeled cars, substantially as shown and described.

2. An endless flexible belt-rail combined with and supported upon driving-wheels and one or more cars provided with propelling wheel or wheels resting upon the top of the circulating belt-rail and having an independent propulsion thereon, substantially as shown and described.

3. The combination, with the supporting and driving wheels B, of the endless belt-rail A, resting edgewise upon said wheels and provided with laterally-projecting arms carrying rollers or wheels for steadying, guiding, and maintaining the upright position of said belt-rail, substantially as shown and described.

4. The combination, with the endless circulating belt-rail A, of a car having one or more propelling-wheels resting upon the upper edge of rail A and having arms or stays projecting from the car and provided at their ends with friction-rollers bearing against the belt-rail to steady the car, substantially as shown and described.

5. The combination, with the endless circulating belt-rail and the car having independent means of propulsion thereon and laterally-projecting wheels *e e*, of the inclined side-track rails E, arranged to be aligned with the wheels *e e* for the purpose of side-tracking the car, substantially as shown and described.

6. The combination of the driving and supporting wheels B for the belt-rail, the belt-rail A, set edgewise thereupon and having laterally-projecting arms with wheels *c* resting upon independent rails, the car D, having driving-wheels *d* resting upon the belt-rail and guide-arms *g*, with rollers *a*, the side-track wheels *e e*, and the side tracks E, substantially as shown and described.

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