(No Model.) 4 Sheets—Sheet 1.

M. E. SCHMIDT & J. L. SILSBEE.

RAILWAY CONSTRUCTION.

No. 440,725. Patented Nov. 18, 1890.

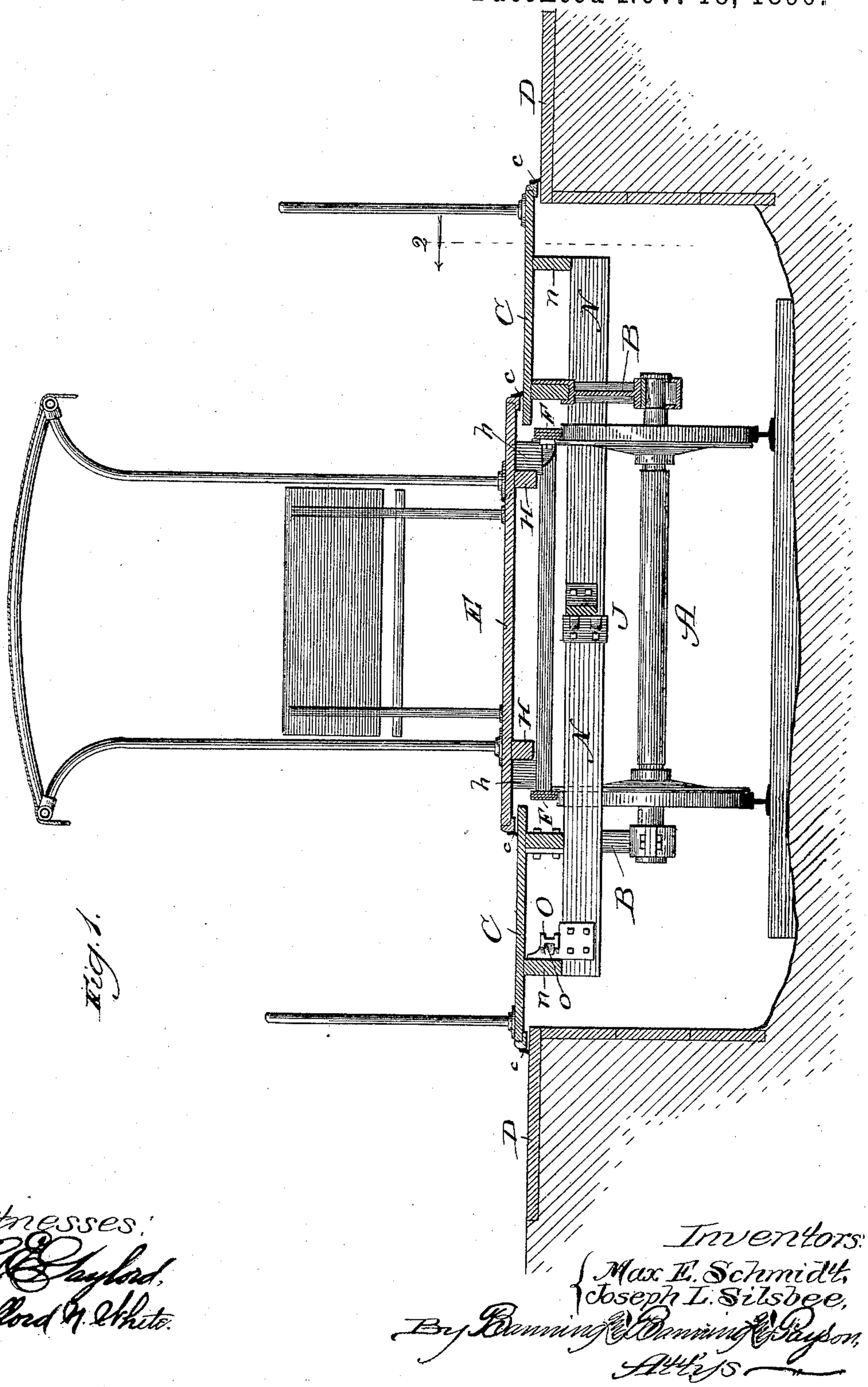

Fig. 1.

Witnesses:
Chas. E. Gaylord,
Clifford H. White.

Inventors:
{ Max E. Schmidt,
Joseph L. Silsbee,
By Banning & Banning & Payson,
Attys

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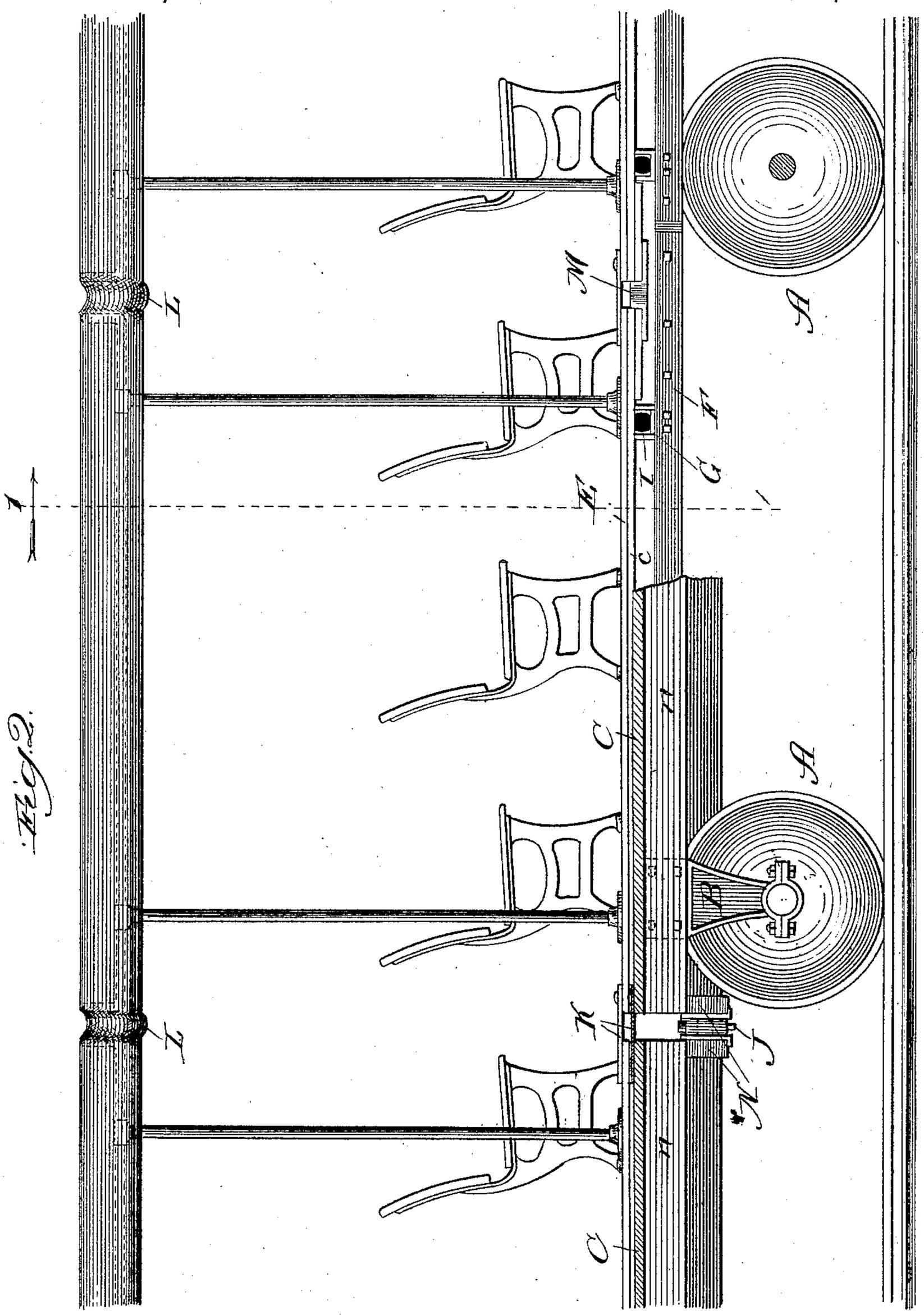

Witnesses:
Chas. E. Gaylord,
Clifford H. White.

Inventors:
Max E. Schmidt,
Joseph L. Silsbee,
By Banning & Banning & Payson,
Att'ys

(No Model.)

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M. E. SCHMIDT & J. L. SILSBEE.

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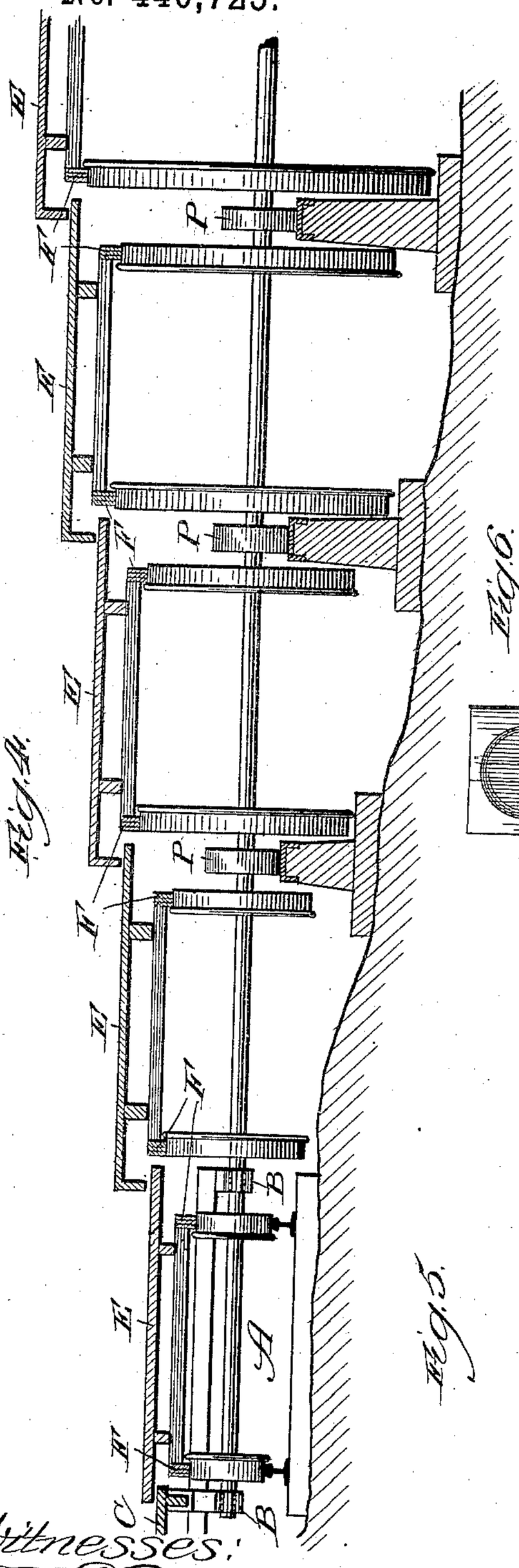

Fig. 4.

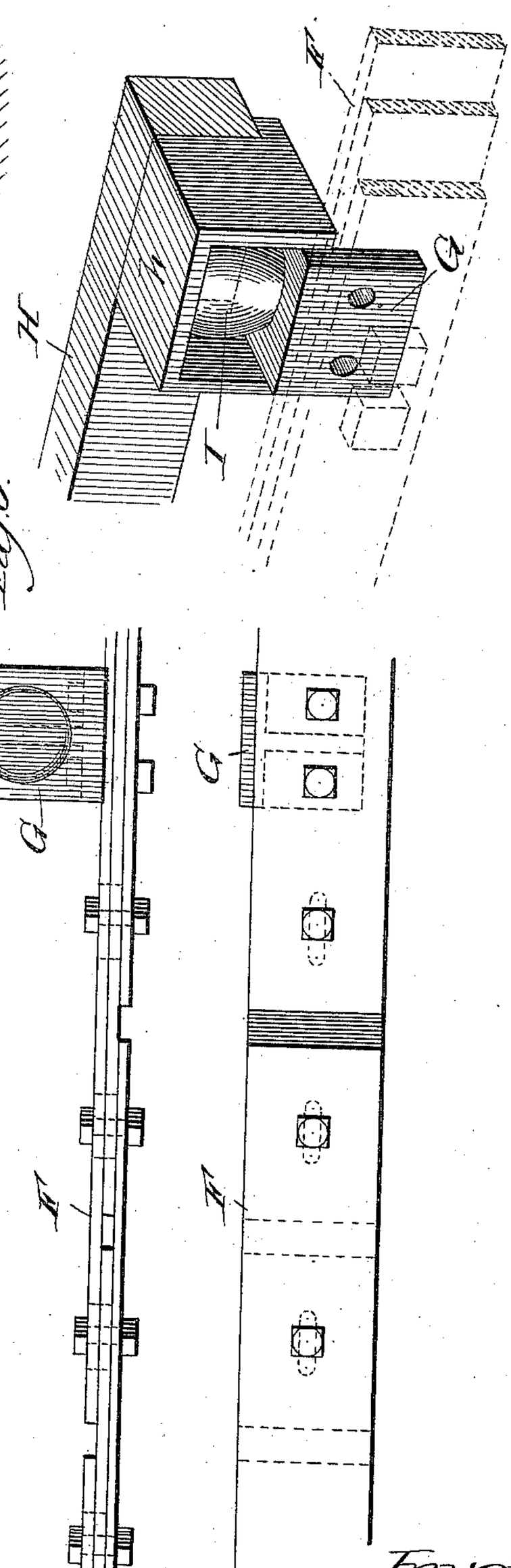

Fig. 6.

Fig. 5.

Witnesses:
Chas. E. Gaylord,
Clifford N. White.

Inventors:
Max E. Schmidt,
Joseph L. Silsbee,
By Benning & Benning & Dayton,
Att'ys.

(No Model.) 4 Sheets—Sheet 4.

M. E. SCHMIDT & J. L. SILSBEE.

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Fig. 3.

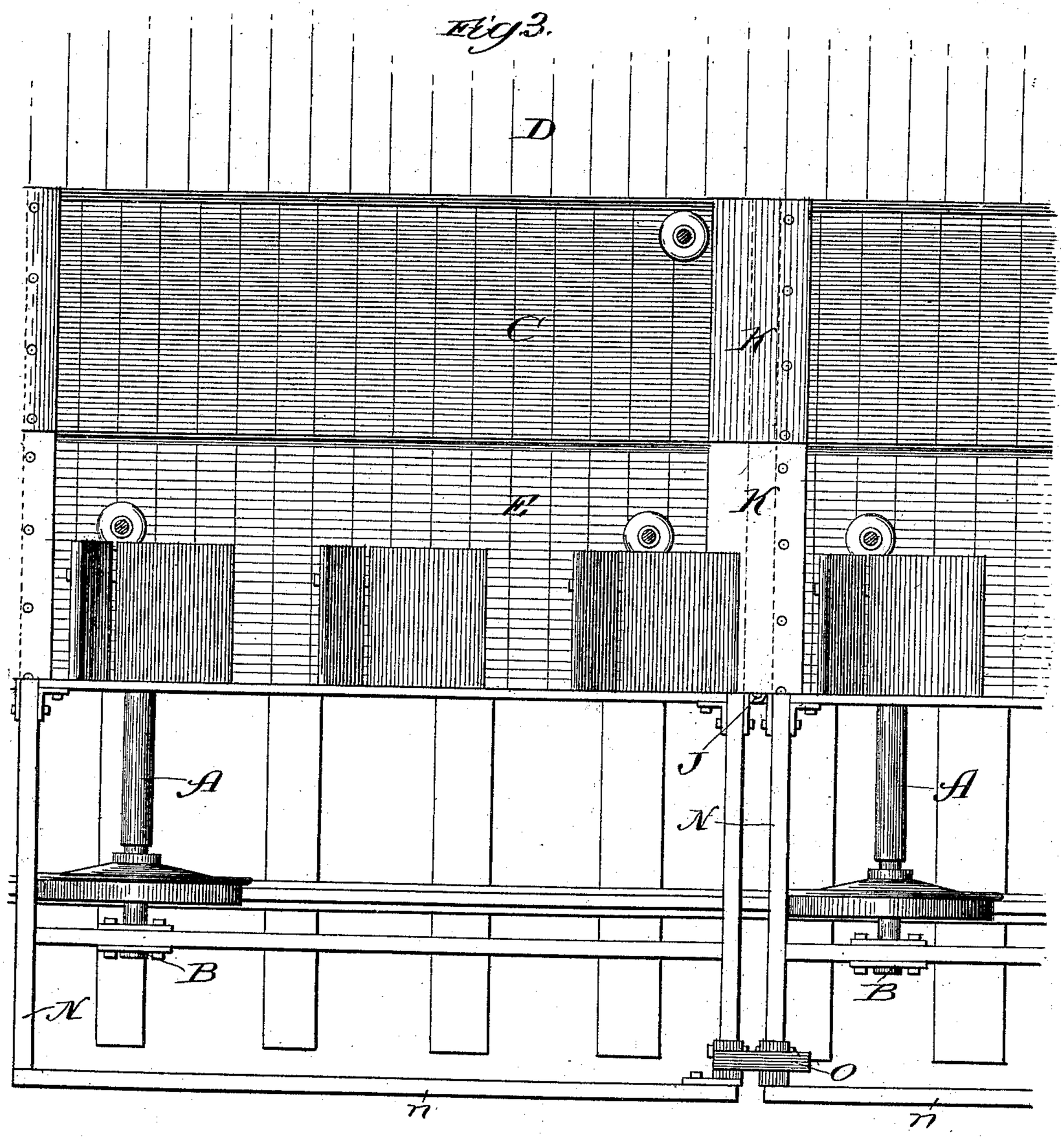
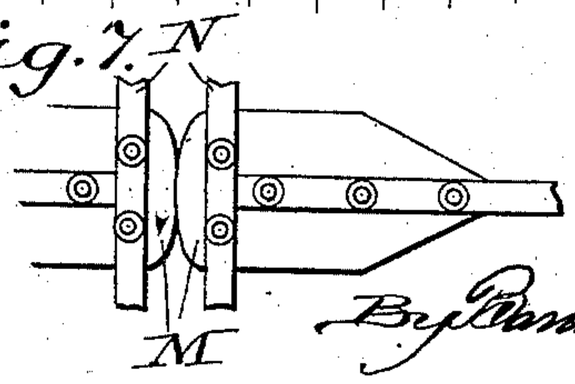


Fig. 7.



Witnesses:
Chas. E. Gaylord,
Clifford H. White.

Inventors,
Max E. Schmidt,
Joseph L. Silsbee,
By Banning & Banning & Payson,
Attys.

UNITED STATES PATENT OFFICE.

MAX E. SCHMIDT AND JOSEPH L. SILSBEE, OF CHICAGO, ILLINOIS.

RAILWAY CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 440,725, dated November 18, 1890.

Application filed August 7, 1890. Serial No. 361,322. (No model.)

To all whom it may concern:

Be it known that we, MAX E. SCHMIDT and JOSEPH L. SILSBEE, citizens of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Railway Construction, of which the following is a specification.

Our invention relates to railways for the transportation of freight or passengers, on which cars move at a higher rate of speed than the axles from which the movement is derived. This is accomplished by attaching the cars to movable tracks resting upon the peripheries of wheels mounted upon such axles, so that as the wheels and axles run upon fixed tracks at a certain speed the movable rails and the cars attached thereto will, move at double the rate of speed of the axles, since the mounted rails are carried along with the axles, and also have a motion relatively to such axles owing to the friction between the wheels and rails. In former devices for accomplishing this result the movable rails were made rigid, thereby preventing them from passing around curves of varying radii and rendering them suitable for use on straight tracks only and absolutely unsuitable for an endless or belt railway.

The object of our invention is to overcome this defect, and this we accomplish by making the movable rails to which the cars are attached flexible, thereby enabling them to bend and adapt themselves to curves of different radii, rendering the device operative on any track, whether straight or curved; and our invention consists in the details and features of construction hereinafter described and claimed.

In the drawings, Figure 1 is a vertical transverse section taken through the car and platforms. Fig. 2 is a side elevation of one of the cars and platform, taken in the line 2 of Fig. 1, looking in the direction of the arrow, with a part of the outer platform broken away. Fig. 3 is a plan view of the car and platform with a part of the car body removed, showing the axles, the frame-work of the car, and the track. Fig. 4 is an end elevation showing a modified application of our invention. Figs. 5 and 6 are details of some of the parts, showing the construction of the flexible track, and Fig. 7 a plan view showing the construction of the heads or spacers.

In making our improved railway for securing a more rapid movement of the car than that of the axles on which the wheels are mounted, we lay a fixed track with ordinary rails, such as are generally in use, as shown in Fig. 1. We arrange on the track ordinary flanged wheels, such as are in general use, united by axles A. The ends of these axles are projected through the wheels on at least one side of the car a sufficient distance to afford room for arranging or mounting thereon outside of the wheels brackets, bearings, or supports B, which are held in a vertical position in any desired manner, so as to support thereon platforms C, extending out laterally on one or both sides of the car a desired distance. It will be understood, of course, that the platform is sustained at different points, so as to maintain a horizontal position and be carried forward by the movement of the axles. The outer edge of the platform is intended to be immediately above or adjacent to the ground or a stationary platform D, arranged at the side of the track, and the space between the outer edge of the movable or traveling platform C and the stationary platform D may be suitably protected by an apron *c*, attached to the movable platform and made of any suitable material, but preferably of some flexible material that will enable it to constantly adapt itself to any inequalities that may exist in the surface of the stationary platform. This apron *c* may also be employed where the edge of the car overlaps the traveling platform. The traveling platform C will of course be carried forward at the same rate of speed that the axles on which it is mounted are moved forward, increasing or decreasing its rate of forward movement as the speed of the axle is increased or decreased. Immediately above the wheels, mounted on the axle, is arranged a car E. This car is adapted to carry either passengers or freight, as may be desired, and rests upon rails F of a size and distance apart to enable their lower edges to rest upon the tops of the wheels mounted on the axles. These rails are made flexible laterally, and to that end we prefer to make them as shown in Fig. 5, where they are composed of a number of thin bars arranged on their edges and held together by bolts passing transversely through them. We prefer that these bolts shall be arranged in holes horizontally elongated, as shown in the side view of the rail in Fig. 5,

but that the elongation of the holes for the several bolts shall be omitted in one of the bars composing the rails at each of the bolts. This will enable the other bars containing the elongated holes to move or slide somewhat on the bolt as the rail is bent in passing around a curve. In order to add to the flexibility of the rails F we also prefer to leave a little space between the ends of the several bars composing them, as shown in Fig. 5, and we prefer to break the joints between the ends of the bars, so that no two bars will end at the same point. This will secure sufficient flexibility; but at the same time always afford a smooth and uninterrupted surface to ride on the top of the wheels. These rails extend continuously from car to car; but they are preferably attached to the car at both of its ends by a suitable connection—such as shown in Fig. 6—which will proportion the flexibility and elasticity of the rails properly to each car. This connection consists of an angle iron or bracket G, bolted to the side of the rails and extending inward therefrom to afford a seat or rest for the sills H of the car. The sills are supported primarily on a chair *h*, which rests upon, preferably, a rubber spring I, interposed between it and the inwardly-extending portion of the angle-iron G. The chair *h* and the bracket G fit each other, so that vertical motion only is permitted between them and lateral or longitudinal motion is prevented. In this way means are afforded for supporting the cars upon the rails F and at the same time prevent them from having a rough or jarring motion and from producing the noise that otherwise might be occasioned, while the same mechanism allows the desired flexibility to the rails and keeps the latter in proper relation to the car-platform. It will be understood, of course, that the cars are provided with seats for passengers, or other desired facilities if they are intended for the transportation of freight.

As the axles move forward at any given or desired rate of speed, it is obvious that the flexible rails F and the cars supported on them and moving on the peripheries of the wheels will be carried forward at double such rate of speed. If, for instance, the axles are moving at the rate of two miles an hour, the cars will be moved at the rate of four miles an hour. To prevent the rails F from being moved forward off of the wheels it is of course necessary that such rails shall be made continuous and carried around a circle or loop, so that they will constantly rest upon the peripheries of the wheels and be advanced with the cars as they rotate. A sufficient number of cars may be arranged to make a continuous train around the loop, or, if desired, a smaller number may be employed. In that case the rails F may still be extended around so as to form a continuous rail, though this would not be essential if the axles and wheels are always extended entirely around, as we consider that they must be, and arranged at such distance apart that the rails F would pass onto one set of wheels as they pass off another. In this latter case it would not be necessary to fill either the whole loop or belt with cars or to extend the rails F entirely around. As the platforms C and their connecting-frames are thus continuously moving around a belt or circle with the axles, it is necessary to provide such a connection between them as will permit of their adjusting themselves to the curve of the belt or circle. We therefore attach or couple them together by a vertical pin or pivot J, as shown in Fig. 2, and preferably cover the space between the different sections of the moving platform by plates K, which are fastened to one section of the platform, so that they may move or adjust themselves on the end of the adjacent section to conform to the different positions which the platform assumes in passing around a curve, while at the same time they afford a continuous or uninterrupted flooring. Similar plates may be used between the cars. The tops of the cars are also preferably connected by a flexible covering L to permit of their adjusting themselves to each other as they pass around the curve.

To prevent the cars from being forced against each other too closely to permit of their properly adjusting themselves to each other around the curve and to keep them in their proper positions on the flexible rails and preserve the proper adjustment of the rails under the body of each car, we interpose between the ends of the cars at their centers heads or spacers M, having rounded ends or faces, so as to rock on each other.

To maintain the platforms C relatively level with each other and in their proper relative position to the cars, we prefer to arrange a bar or beam N beneath and transverse to the car and extend its ends out well toward the outer edges of the platforms and interpose longitudinal sills between the beam and the platform. At that end of each section of the platform that is farthest from the wheels we attach a casting O, with a projecting tongue, the outer end of which rests and slides on a wear-plate on the adjacent section. It will thus be seen that that end of each section of the platform which is farthest from the wheels is supported on that end of the adjacent section nearest to the wheels. In Fig. 1 we have shown this tongue as **I**-shaped and as a part of the casting O, though other forms may be employed, if desired.

In Fig. 4 we have shown a modified or extended application of our invention. In that case the axle A carries wheels which rotate on a fixed track, as described above. The axle, however, is extended laterally through any number of sets of wheels, which are mounted and rotated on it, and which vary in diameter from the ones mounted on the fixed rails. These wheels are shown as increasing in diameter, although it is obvious that they might be decreased in diameter, if

desired, although the result secured would be the opposite of that secured by the arrangement shown in Fig. 4. None of these wheels, except the first of the series, rest or rotate upon tracks; but the axles may be supported at convenient intervals by wheels P, of uniform diameter with the wheels rotating on the fixed track. Arranged on each set of wheels are traveling rails F, carrying platforms or cars, as may be desired. Each of these sets of rails is advanced or moved forward at a greater speed than the set preceding it, and consequently carries the platform or the car resting on them at such increased speed. The ratio of increase in the speed of the succeeding platforms or cars can be approximately governed or determined by making the succeeding sets of wheels of the desired increase in diameter. In this way the speed of the different platforms and cars, while maintaining a predetermined relation to each other, may be carried to as high a point as desired.

Of course it will be understood that in practice we prefer to arrange the cars on the last set of the series of movable rails, so as to secure the highest degree of speed for the transportation of the passengers or freight for which they are provided. It may be found desirable, however, to arrange the fixed track at some intermediate point in the series of platforms and increase and decrease the speed of the platforms at its opposite sides. This, however, involves no departure from the principle of our invention. Where the cars are arranged on the last of the series of wheels increasing in speed, we will be able, however, to secure the highest rate of speed for the cars with the minimum rate of speed or advance of the axle. It is also obvious that if we dispense with all of the sets of traveling rails, except the one moving on the wheels rotating on the fixed track, we would still be able to secure a rate of speed for the cars resting on them double the rate of speed or advance of the axle.

It will be seen from the above description that a passenger on our railway may with ease and safety step from the ground or stationary platform onto the movable platform and from that onto the car, and that this may be done while both the platform and the car are moving at their ordinary speed, it being understood that the movable platform and the car are to be kept constantly in motion at their predetermined speed.

What we regard as new, and desire to secure by Letters Patent, is—

1. In a railway for increasing the speed of the car over that of the axle, the combination of a fixed track, wheels rotatable on the fixed track, flexible traveling rails supported on the peripheries of the wheels and advanced as they rotate, and a car or cars supported and carried on the traveling rails as they advance, substantially as described.

2. In a railway for increasing the speed of the car over that of the axle, the combination of a fixed track, wheels rotatable on the fixed track, an axle connecting such wheels and extending beyond them on at least one side of the car, supports arranged on the extended ends of the axle on at least one side of the car, a traveling platform supported and carried on such supports, flexible traveling rails supported on the peripheries of the wheels and advanced as they rotate, and a car or cars supported and carried on the traveling rails as they advance, substantially as described.

3. In a railway for increasing the speed of the car over that of the axle, the combination of a fixed track, wheels rotatable on the fixed track, an axle connecting such wheels and extending beyond them on at least one side of the car, supports arranged on the extended ends of the axle on at least one side of the car, a traveling platform supported and carried on such supports at a rate of speed relative to the ground or a fixed platform determinable by the speed of the axle, flexible traveling rails supported on the peripheries of the wheels and advanced as they rotate at a rate of speed approximately double that of the traveling platform, and a car or cars supported and carried on the traveling rails as they advance, substantially as described.

4. In a railway for increasing the speed of the car over that of the axle, the combination of a fixed track, wheels rotatable on the fixed track, an axle connecting such wheels and extending beyond them on at least one side of the car and supported at intervals on wheels of the same diameter as the wheels rotatable on the fixed track, sets of wheels mounted on and rotatable by the extended end of the axle and varying in diameter from the wheels rotatable on the fixed track and from each other at any determinate desired ratio, flexible traveling rails supported on the peripheries of the different sets of wheels and advanced as they rotate at a varying speed determinate by the diameters of the wheels on which they are mounted, and a platform or a car supported and carried on the traveling rails as they advance, substantially as described.

5. A series of two or more traveling platforms, each having its frame-work supported on a single pair of wheels at or near one end and supported at the other by the next adjacent traveling platform, substantially as dedescribed.

6. A railroad-rail composed of flat metallic bars adjustably connected together to secure flexibility and strength, substantially as described.

MAX E. SCHMIDT.
JOSEPH L. SILSBEE.

Witnesses:
THOMAS A. BANNING,
ANNIE C. COURTENAY.