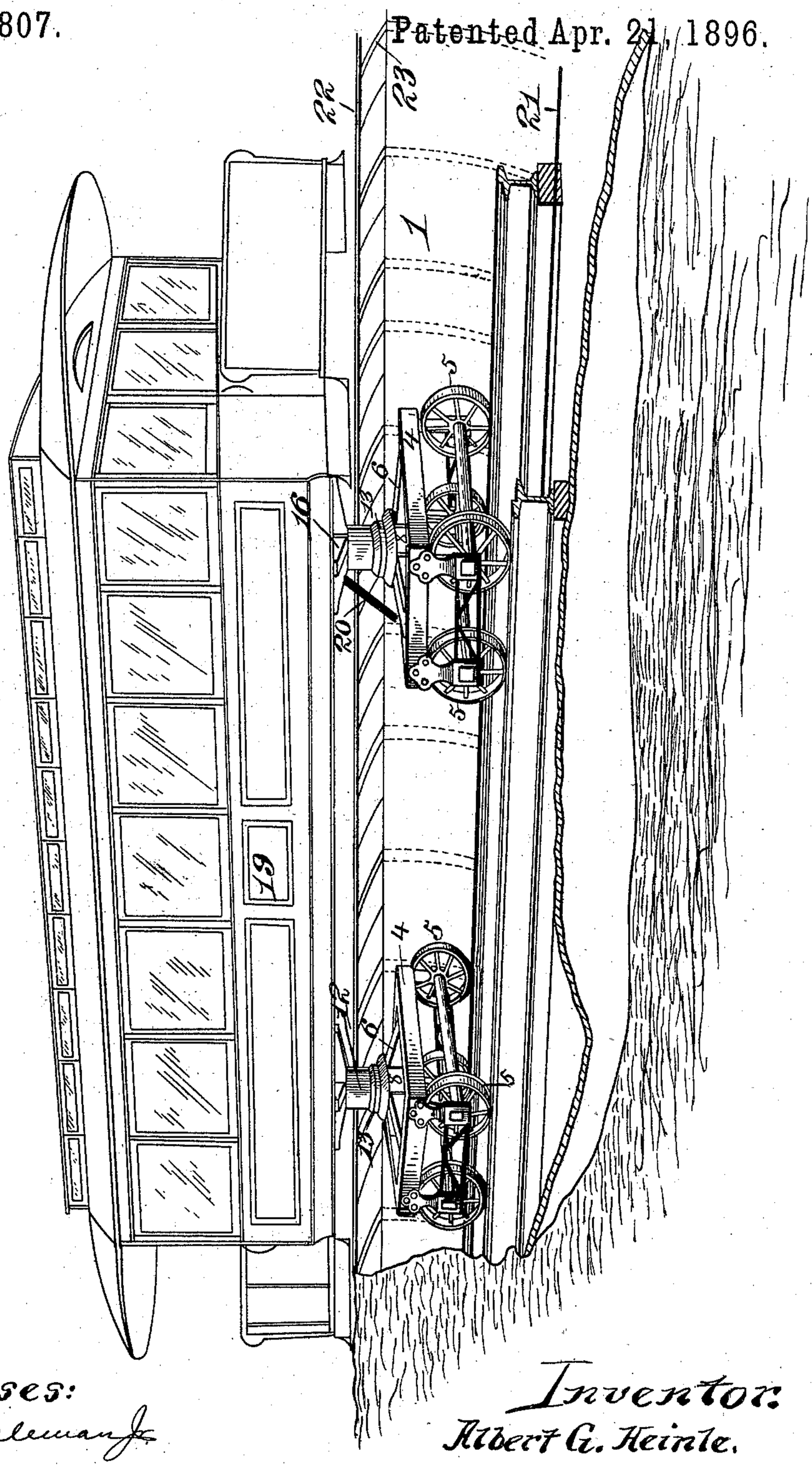
(No Model.) 2 Sheets—Sheet 1.

A. G. HEINLE.

UNDERGROUND RAILWAY SYSTEM.

No. 558,807. Patented Apr. 21, 1896.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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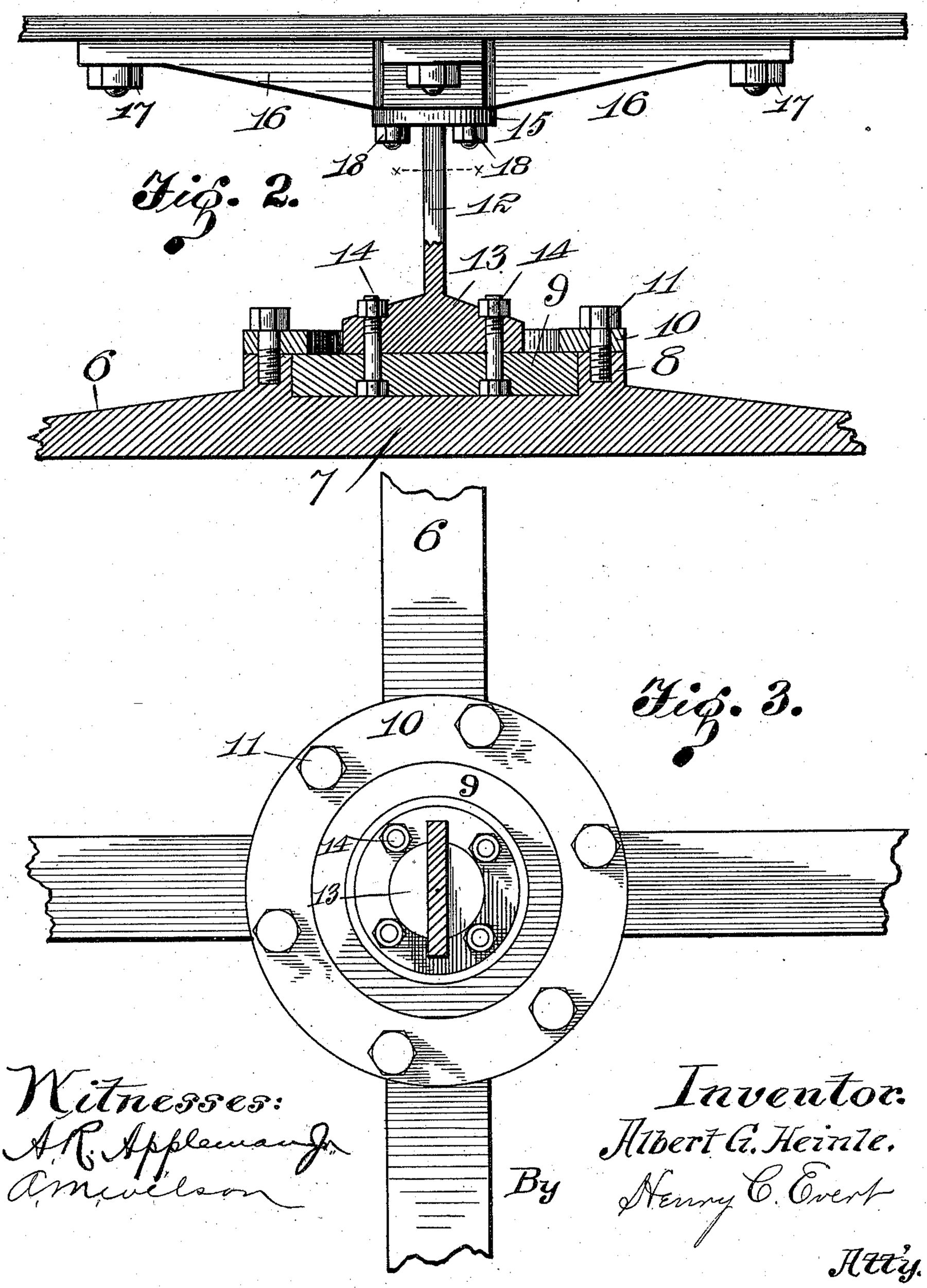

Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

ALBERT G. HEINLE, OF ESPLEN, PENNSYLVANIA.

UNDERGROUND RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 558,807, dated April 21, 1896.

Application filed October 10, 1895. Serial No. 565,209. (No model.)

To all whom it may concern:

Be it known that I, ALBERT G. HEINLE, a citizen of the United States of America, residing at Esplen, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Underground Railway Systems, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain new and useful improvements in railways in general, and relates more particularly to that class known as "street-railways."

The invention has for its object the provision of new and novel means whereby a railway may be constructed with the track thereof underground, as well as the wire or cable, as the case may be, and thereby overcome many difficulties existing at the present time in the ordinary manner of construction.

A further object of the invention is the construction of a railway of the above-referred-to class whereby the danger to life and limb will be greatly reduced, and in fact almost entirely avoided; furthermore, the construction of a railway, as above described, that will not be affected by snow, and thereby overcoming a very serious difficulty in the operation of street-railways during the winter months.

A still further object of the invention is the construction of a street-railway that will provide a means for rapid transit in the streets of cities where overhead-wires are not permitted, on account of the danger connected therewith, and where a cable line in the same locality may be found disadvantageous to operate.

Still further objects of the invention are the construction of a railway of the above-referred-to class that will be extremely simple in its construction, and on which any power desired for propulsion may be used; furthermore, that will be strong and durable, and requiring less repairs than the ordinary construction of railway-tracks, and that will be comparatively inexpensive to construct.

With the above and other objects in view the invention finally consists in the novel construction and arrangement to be hereinafter more specifically described, and particularly pointed out in the claims.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like figures of reference indicate similar parts throughout the different views of the drawings, in which—

Figure 1 is a perspective view of a car and a section of my improved underground system, showing the construction thereof. Fig. 2 is a vertical sectional view of the supporting-plate, showing method of securing same. Fig. 3 is a top plan view of the same, taken on the line X X of Fig. 2.

In the drawings, 1 represents the conduit for the reception of the track and trucks of the car. The conduit may be constructed of sheet-iron, masonry, or any other suitable material and in any manner desired.

2 represents the rails of the track, which in the drawings have been shown as secured to beams 3; but the same may be supported by braces secured to the sides of the conduit 1 or in any other suitable manner.

4 4 indicate the framework of the trucks, and 5 5 5 5 the wheels of the same. Further figures of reference on the body portion of the truck are deemed unnecessary, as the style shown in the drawings is of ordinary construction for these parts, and it will be noted that any style or particular make of truck can be readily adapted for use on my improved underground system, with some changes in the minor details of construction of the same, as will be hereinafter pointed out.

To the framework 4 4 of the truck are suitably secured arms 6 6 6 6, which are connected to a circular plate 7, which is provided on its outer extremity with a collar 8, thereby forming a seat in the plate 7 for the reception of a circular plate 9. A washer 10 is provided to fit on the top of the collar 8, said washer extending partly onto the plate 9, forming a flange and securing the same in position by means of bolts 11 11 through the washer and collar. The supporting-plate 12 is provided on the lower end with a circular plate 13, and is connected by means of this plate to the circular plate 9 by bolts 14 14 14 14, the heads of said bolts being recessed in the plate 9, as shown in Fig. 2 of the drawings. The supporting-plate 12 is also provided on its upper extremity with a circular plate 15, which is also provided with arms 16 16 16 16 for se-

curing to the framework of the car by means of bolts 17 17 17 17, and the circular plate is also secured by means of bolts 18 18.

In the drawings, the car 19 is presumably equipped for electricity, and the trolley-pole is represented by the reference-figure 20 and the wire carrying the current as 21. The supporting-plate 12 is adapted to operate through the slot 22, which may be constructed in the ordinary manner as now used for cable-lines or in any suitable manner, and in the drawings I have shown supporting-ribs 23 23 from the top of the conduit 1 to the sides of the pieces forming the slot, thereby helping to retain the said sides in position.

From the perspective view of my improved railway which I have shown in Fig. 1 of the drawings the mode of operation will be readily understood. It will be noted in this illustration that the wire containing the current is placed in the conduit, and the trolley-pole engaging the same is connected to the underneath portion of the car, instead of overhead, as in the present method, and the action of the supporting-plate 12 will be readily understood from the view which I have shown in Fig. 2 of the drawings, as when the truck is on a curve the plate 9 will allow the supporting-plate 12 to conform with the position of the truck by revolving in the bearing formed in the plate 7 by the collar 8 and the washer 10.

By this construction of an underground system it will be noted that the track need not be as wide as in the ordinary construction, and the only change required in the ordinary construction of trucks, so far as the body portion of the same is concerned, will be the constructing of same with a narrower tread than the standard gage, and this construction of the system will require very little if any more excavating than is necessary in the construction of the conduit for a cable-line of the present construction.

It will be readily understood that in the construction of the system it can readily be adapted to suit any means of propulsion-power that it may be desired to use. For instance, it will be noted that the pulley-wheels necessary for the guidance of the cable can be readily placed between the tracks and the grip operated from the front of the car, engaging the cable through the slot, as in the present method of operation. The rod engaging the brakes will also be operated through the slot by an arrangement provided as in the ordinary manner on the car-platform for this purpose, as will be readily apparent, and which I have deemed unnecessary to show and describe in the drawings.

I wish to call particular attention to the fact that, my system being an underground one, the noise of the car passing over the tracks will be to a very great extent confined within the conduit, which is of great advantage, especially where the cars run through resident portions of the city.

Another particular feature which has been heretofore mentioned, but to which I wish also to call particular attention, is the prevention of the loss of life and limb. Should a person be struck by a car on a line equipped with my improved system, it will be readily noted that should they fall in under the car the same will readily pass over the body without further injury, unless caught by the supporting-plate, and the only injury that would result from this would be the dragging of the person until the car could be stopped.

The advantages of my system during snowstorms will also present themselves to any one skilled in railroading, as it will be noted that it would take a very considerable fall of snow to interrupt the traffic on a line equipped with this system; and another advantage is, the car-bed being lower than in the ordinary construction, the ingress and egress will be much more easy than in the ordinary construction; and also, in this connection, the advantages during a storm of sleet will be very apparent, as the wires cannot be covered by sleet, which is a great inconvenience where overhead wires are used.

I also wish to call particular attention to the fact that where electric motive power is used for propulsion on my improved system there will be no poles necessary for retaining overhead wires, and another advantage in abolishing the overhead wires is in case of a fire, as it is a well-known fact that these wires often seriously interfere with the work of the firemen, and it will also add a neater appearance to the street than were the overhead wires and poles used.

It will be noted that various changes in the details of construction of my improved underground system may be necessary in the building of lines in different localities, and I do not wish, therefore, to limit myself to the specific construction as herein shown and described, but these changes in the details of construction may be made without departing from the general spirit of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an underground system for railways, the combination of a conduit having a track constructed therein, a car-truck riding therein, a car-body arranged above the ground and engaging a plate, said plate carrying a supporting-plate operating through the slot of the conduit, and being constructed with a circular plate on its base and secured to an auxiliary plate, as and for the purpose described.

2. In an underground system for railways the combination of a conduit having a track constructed therein a car-truck riding therein a car-body arranged above the ground and the body being secured to the frame of the truck arms which are connected to a circular plate provided with a collar, a washer secured to said collar and forming a flange engaging an auxiliary plate thereby retaining the same in position, substantially as described.

3. In an underground system, a conduit and a suitably-constructed car having secured to its underneath portion arms engaging a plate, said plate carrying a supporting-plate operating through the slot of the conduit, and being constructed with a circular plate on its base and secured to an auxiliary plate, substantially as shown and described.

4. In an underground system, a suitable conduit, and a suitably-constructed car, said car having secured to the frame of the trucks arms, said arms being connected to a circular plate provided with a collar, a washer secured to the said collar, and forming a flange engaging an auxiliary plate thereby retaining the same in position, substantially as shown and described.

5. An underground railway system consisting of a suitably-constructed conduit and car, said car having a truck with arms secured thereto and carrying a circular plate 7, provided with a collar 8, a circular plate 9, arranged on the plate 7, a washer 10 engaging the plate 9 and collar 8, and the plate 9, being suitably secured to a supporting-plate 12, operating through the slot, said supporting-plate being secured by means of arms to the underneath portion of the car, substantially as shown and described.

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

ALBERT G. HEINLE.

Witnesses:
ALFRED M. WILSON,
H. C. EVERT.