(No Model.) 3 Sheets—Sheet 1.

J. T. SCHWEIZER & J. H. BURGER.

CABLE CAR TRANSFER DEVICE.

No. 512,910. Patented Jan. 16, 1894.

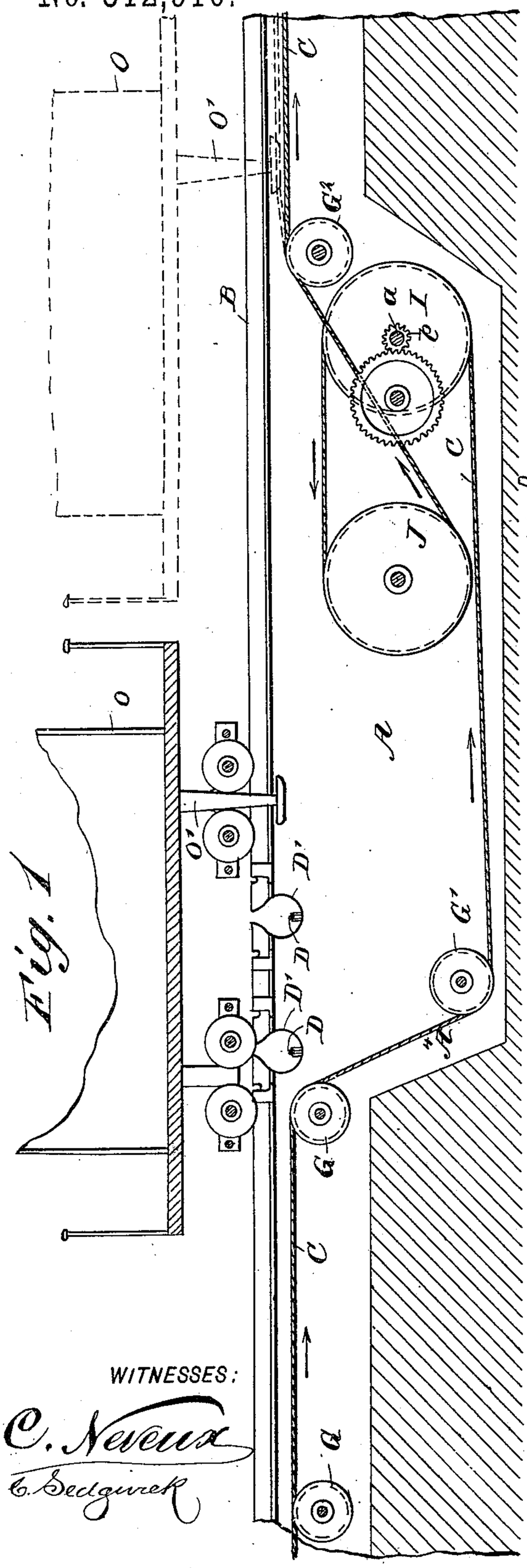

Fig. 1

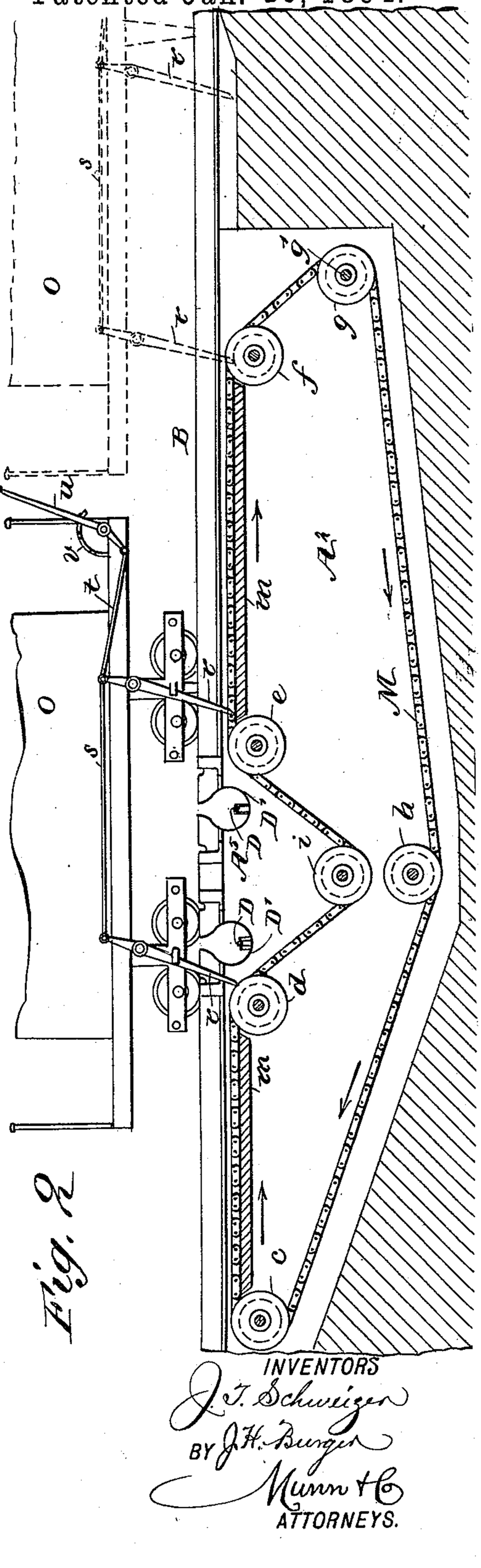

Fig. 2

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CABLE CAR TRANSFER DEVICE.

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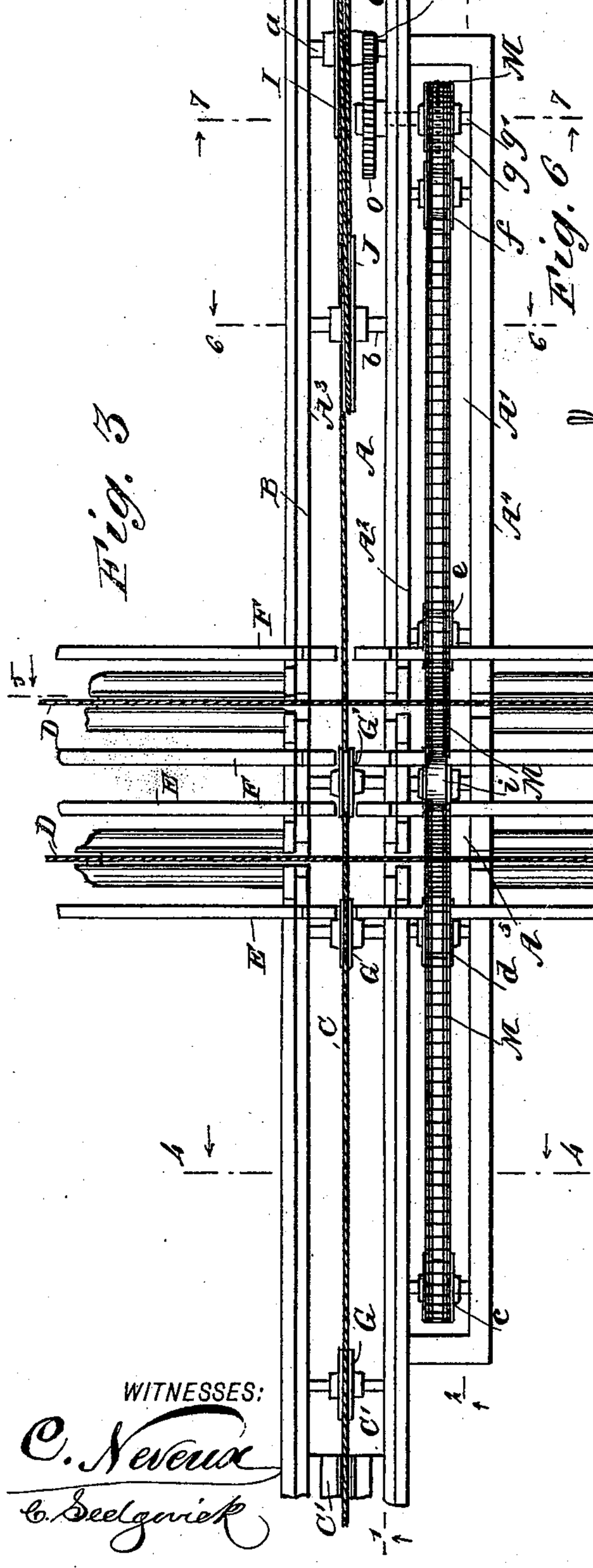

Fig. 5

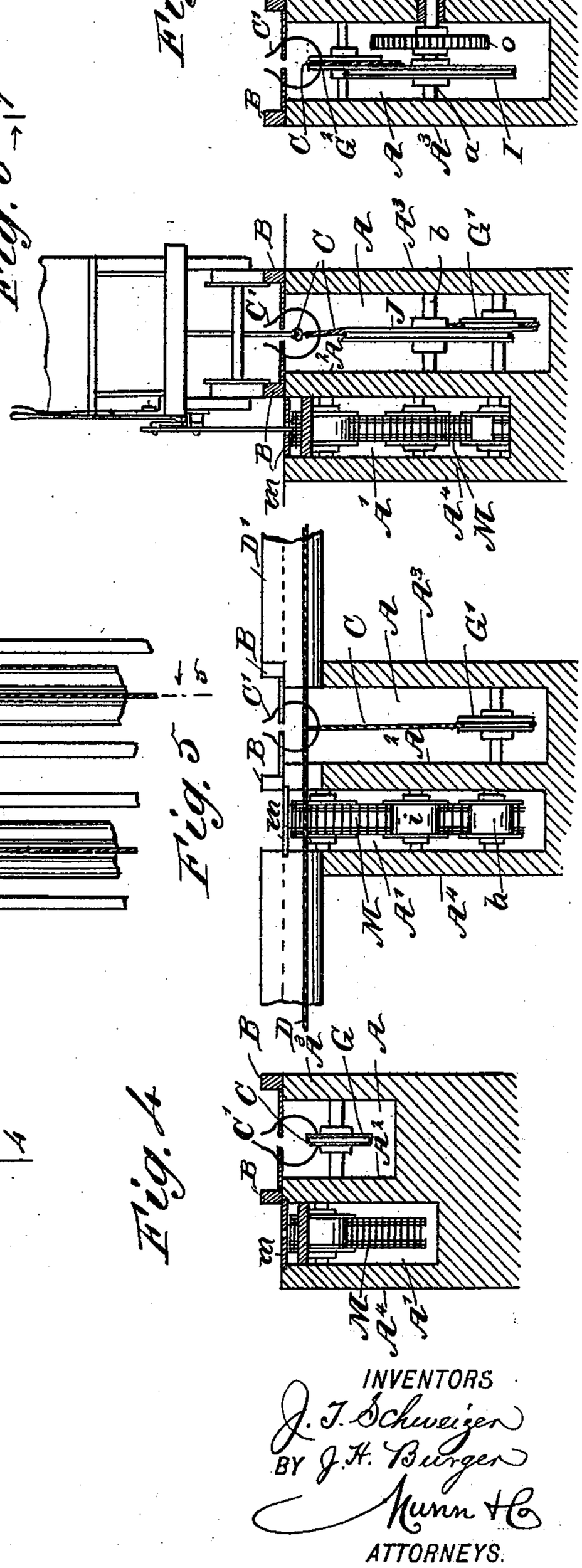

Fig. 6

Fig. 7

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Fig. 10

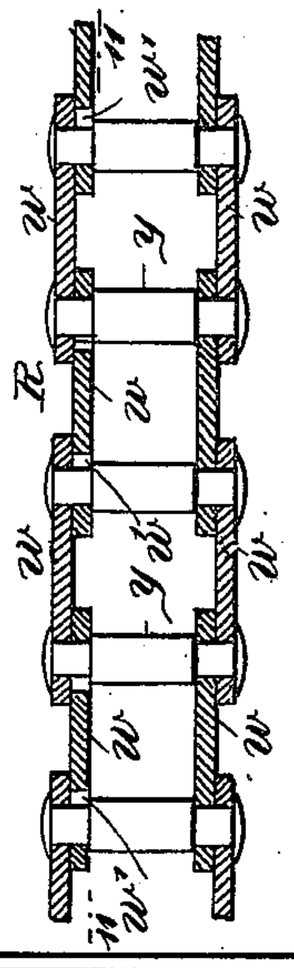
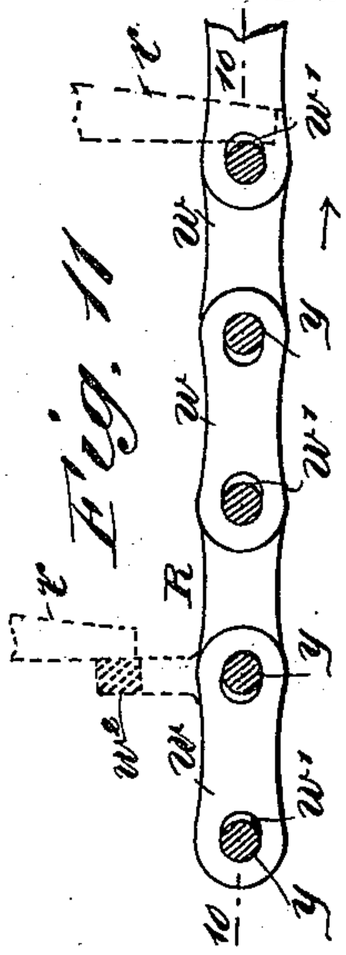


Fig. 11



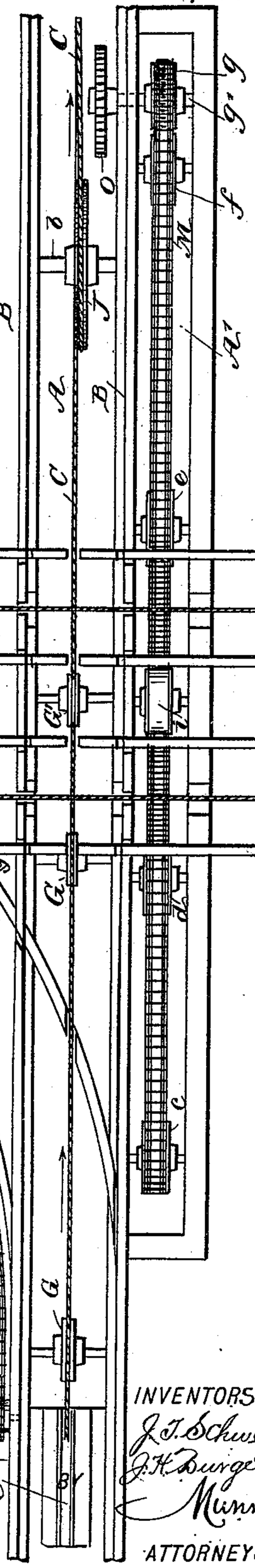
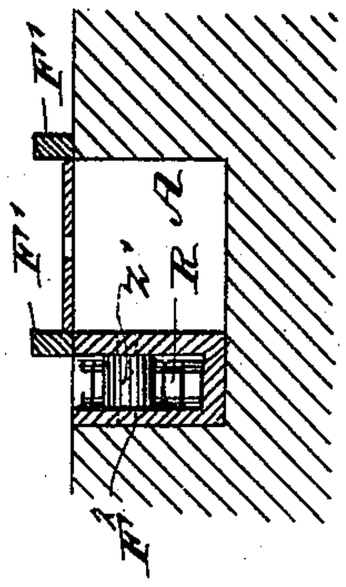


Fig. 8

Fig. 9



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UNITED STATES PATENT OFFICE.

JOHN T. SCHWEIZER, OF WILMINGTON, DELAWARE, AND JACOB H. BURGER, OF PHILADELPHIA, PENNSYLVANIA.

CABLE-CAR TRANSFER DEVICE.

SPECIFICATION forming part of Letters Patent No. 512,910, dated January 16, 1894.

Application filed May 20, 1893. Serial No. 474,981. (No model.)

To all whom it may concern:

Be it known that we, JOHN T. SCHWEIZER, of Wilmington, in the county of New Castle and State of Delaware, and JACOB H. BURGER, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Cable-Car Transfer Devices, of which the following is a full, clear, and exact description.

This invention relates to an improved device for the transfer of cars driven by a moving cable in a conduit, across other cables and conduits containing them, which are located at a right angle to said moving cable and its conduit, and the object of our invention is to provide a simple and practical mechanism which will receive power and motion from the moving cable, and furnish means for the reliable transfer of cars that are normally driven by a gripped connection with a moving cable, across another cable located at an angle thereto.

To this end our invention consists in the construction and combinations of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side view in section of the improvement on the line 1—1 in Fig. 3, and of a car in part, above the novel device. Fig. 2 is a side view, in section on the line 2—2 in Fig. 3, showing features of the improvement, and a car engaged therewith. Fig. 3 is a plan view of the device with parts removed to expose the mechanism below. Fig. 4 is a transverse sectional view of the improvement on the line 4—4 in Fig. 3. Fig. 5 is a transverse sectional view on the line 5—5 in Fig. 3. Fig. 6 is a view in cross section on the line 6—6 in Fig. 3, and an end view of a car in part. Fig. 7 is a transverse sectional view on the line 7—7 in Fig. 3. Fig. 8 is a plan view of cable railways at a crossing point, and the improved car transferring device, arranged to move a car from one railway track to another track crossing at a right angle to the first mentioned track. Fig. 9 is a transverse sectional view on the line 9—9 in Fig. 8. Fig. 10 is an enlarged plan view, in section on the line 10—10 in Fig. 11, showing a portion of a sprocket chain of improved construction, which is an adjunctive feature of the improvement; and Fig. 11 is a side view of the improved sprocket chain, in section on the line 11—11 in Fig. 10.

The novel car transferring mechanism is placed below the road-beds of two intersecting streets, whereon the intersecting railways are placed, there being an elongated underground chamber provided beneath the track rails of one railway and along one side of the same, for the reception of the transferring mechanism. The underground chamber is produced by an excavation at the crossing as stated, and extends below and parallel with the track B, and at one of its sides, beneath the cable C, that belongs to said track, this cable being located below one or more cables D, that are transversely arranged below a crossing railway.

There are two cables D, shown, to clearly illustrate the working of the improvement, which cables lie below the road-bed whereon the parallel railway tracks E, F, are sustained, and are protected by the conduits D′.

The excavation is walled on its sides, and preferably two compartments A, A′, are produced by the erection of a partition wall A^2, one side wall of the chamber A, affording a foundation for one series of track rails for the railway track B, the partition wall A^2, supporting the parallel series of rails that complete this railway track where it extends above the chamber A. The compartment A′, that is at one side of the railway track B, is walled at its outer side A^4, parallel with the partition wall A^2, and the ends of both compartments are protected by walls.

The conduit C′, which protects the cable C, in the road-bed of the track B, is terminated in the end walls of the chamber or compartment A, which chamber is in effect an enlarged portion of the conduit named.

The cable C, is sustained on a series of grooved idler pulleys such as G, in Fig. 1, one of said pulleys being located on or near the end A^4, of the compartment A, from which pulley the cable is downwardly projected to pass below an idler pulley G′, that is rotatably supported near said end wall of the compartment, and close to its bottom wall.

The cable C, is moved in the direction of the indicating arrows in Fig. 1, and from the idler pulley G′ extends toward the opposite end wall of the compartment it occupies, where a grooved driving pulley I, is supported by a transverse shaft *a*, that is journaled at its ends and loosely sustained by an engagement of said journals with any suitable bearings, that are located in or upon the sides of the walls A^2 A^3, the sides of the driving pulley and its grooved periphery being aligned with the similar parts of the pulley G′. At a proper distance from the driving pulley I, and between said pulley and the idler pulley G′, a grooved counter pulley J, is rotatably supported by a counter-shaft *b*, that is journaled in or on the side walls A^2, A^3, of the compartment A.

The cable C, is imposed on the lower side of the periphery of the driving pulley I, and extends upwardly thereon and thence is projected toward the counter-pulley J, whereon it is wrapped, as shown by indicating arrows in Fig. 1, trending upwardly and along the side of the driving pulley to have engagement with the upper side of the grooved idler pulley G^2, and thence through the conduit C′, which is extended from this end of the compartment A, as before explained; and it will be seen that the direction of progressive movement given to the cable C, is the same in the portion which leaves the compartment A, over the idler pulley G^2, as that of the cable before it passes below the idler pulley G′, at the opposite end of the compartment named.

In the compartment A′, an endless sprocket chain M, is located as shown in Figs. 2 and 3, which chain is supported in parallel with the railway track B, by the peripherally grooved pulleys *c*, *d*, *e*, *f*, *g*, *h* and *i*. The pulleys *c*, *d*, *e*, and *f*, are located in the same horizontal plane, on proper supporting shafts that are loosely sustained at their ends, in or on the outer side walls A^4, of the compartment A′, and also upon the partition wall A^2, that is in parallel with said side wall, the position of said pulleys adapting them to receive the sprocket chain on their upper surface and maintain it near to the top of the compartment A′, in loose contact with the top wall plates *m*, that are extended across the compartment and between the pairs of pulleys *c*, *d*, and *e*, *f*, leaving an open space at A^5, between the pulleys *d*, *e;* the chain M being bent downwardly between the last named pulleys to engage with the lower surface of the periphery of the idler pulley *i*. From the pulleys *c* and *f*, the sprocket chain M is depressed to have an engagement with the idler wheels *h* and *g*, as shown in Fig. 2, thereby completing the supporting mechanism for the chain, which is stretched taut by a proper adjustment of said pulleys, and as indicated in the figure named the space between the idler pulleys is partly occupied by the conduits D′. The transverse shaft *g*′, that sustains the wheel *g*, is extended through the partition wall A^2 into the compartment A, and on said shaft extension a spur gear wheel *o*, is secured which gear wheel is in meshed engagement with a gear pinion *p*, that is secured on the shaft *a*, which supports the driving pulley I. The pulley *g*, is provided with teeth on its face, which project therefrom at such intervals as will adapt the teeth to interlock with the cross bars of the sprocket chain M, that is caused to progressively move on its supports in the direction of the indicating arrows in Fig. 2, when the cable C, is in motion.

The relative position given to the grooved pulleys *d*, *e* and *i*, is such that the sprocket chain M will be sufficiently depressed to permit the chain to pass below the conduits D′, and the cables D, that these conduits contain, the level portions of said chain moving in the same direction as the cable C.

A preferred means for detachably connecting a passenger car O, with the sprocket chain M, is shown in Fig. 2, comprising two upright arms *r*, that are pivoted to rock on the side of the car that is nearest to the sprocket chain, the lower ends of said levers being made to pass through a longitudinal slot in each cover plate *m* and engage with the cross bars of the chain when this is desired. The arms *r*, are connected at their upper ends above the points of their pivotal support on the car, by a rod *s*, which is pivoted thereto. A shorter rod *t*, that is jointed to one end of the rod *s*, or upon the adjacent lever *r*, is loosely secured at its forward end to a vibratile upright lever *u*, which is pivoted near the front of the car platform conveniently for manipulation by the grip-man on the car, said lever being adapted for a secured attachment to the arch plate *v*, at any point of vibratory movement required to interlock the lower ends of the arms *r*, with the sprocket chain M, or hold them elevated therefrom.

The operation is as follows:—The car moving on the railway track B, and drawn by the cable C, will have to cross the cables D, on the route from one end of the railway B, toward the other end, and when the car has so nearly approached the transversely located cables D that the sprocket chain M may be utilized, the usual grip arm O′ on the moving car is released from the cable C, and the arms *r* are depressed, so as to interlock with the sprocket chain. Preferably the speed of the chain M is reduced as compared with the motion of the cable C, so that the operator may connect the arms *r*, without jar, which adjustment of parts is effected about the same time the cable is dropped by the grip arm. It will be seen that the provision of the two arms *r*, which are spaced apart a distance slightly exceeding the degree of separation given to the pulleys *d*, *e*, will permit the rear arm to have an assured hold on the chain M, until the forward arm engages it, and when the forward arm is released from the chain by a progressive movement of the car, the rear arm *r* will again take hold of

the chain and move the car far enough to permit the cable grip arm O′, to be made fast to the cable C, thus effecting the speedy and reliable transfer of the loaded car across the cables D.

In Fig. 8, a diagrammatic plan view is shown of a method for utilizing the cable D of a cross railroad F, to transfer the car moving toward said road on railway B, around a curved track that is provided to switch a passenger car from one railway track to the other track that crosses it. The curved track F′, is extended from the track B to intersect the track F, and below the latter named railway track an underground chamber such as A, is constructed, wherein chain actuating mechanism is located that is similar to that already described, which mechanism is connected to the cable D, that moves in the direction of an indicating arrow shown in Fig. 8. On the side of the curved track F′ that is nearest to the railway track E, which the curved track crosses to intersect the parallel track F, an underground curved guide box F^2, is located for the reception and proper support of an endless sprocket chain R. To adapt the chain R, for a free movement in the guide box F^2, said chain is preferably constructed as represented in Figs. 10 and 11, comprising the double series of overlapping links *w*, that are held loosely jointed together and the two series in parallel, by the shouldered cross bars *y* which are secured from displacement by any suitable means, the reduced portions of the bars at one end engaging aligned perforations in the lapped links of one series, and passing through longitudinal slots or holes *w′* in the inner set of links forming parts of the other series of lapped links, the outer set of said series being perforated to fit the reduced end portions of the cross bars that have passed through the slots, as shown in Fig. 10. By the construction and arrangement of the link plates forming the sprocket chain R, a limited degree of lateral curvature is permitted in said chain, as the slotting of the link plates will adapt the overlapping links to slide endwise, so as to lengthen or shorten the entire chain on the side of the same which has the slotted links. The guide box F^2 is bent downwardly where it crosses the track E, so as to permit the chain R, to pass below the cable D, that occupies the railway E, and to facilitate the movement of the chain and retain it in loose connection with the guide box, rollers *z z′* are pivoted transversely in the box, at intervals, one of which rollers *z′* is placed above the chain at the point of lowest depression given the chain, which will prevent draft strain applied to the chain from lifting it out of the guide box. The sprocket chain R, is in geared connection with the counter pulley J, which is shown in Fig. 8, connected to the cable D, which is adapted to move the gearing that is omitted in said figure, but is similar to that represented in Figs. 1, 3 and 7. Consequently the progressive movement of the cable D, will correspondingly move the sprocket chain R, and cause it to draw a car from the railway track B, onto the cross track F, if said car is provided with a device such as has been previously described, for its detachable connection with the endless sprocket chain R.

If it is found inexpedient in some locations to project the arms *r*, between the cross bars *y* of the sprocket chain that drives the car O, said chain may be provided with a series of upwardly projecting limbs w^2, shown by dotted lines in Fig. 11, which limbs will form abutments that will press the lower ends of the arms *r*, which may then be made shorter so as to avoid engagement with the chain proper.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a cable car transferring device, the combination with a cable beneath a railway track, passing below a transverse cable, and a chamber beneath the lowermost cable, of an endless sprocket chain, idler wheels supporting the chain which is depressed below the transverse cable, mechanism in the chamber driven by one cable and actuating the sprocket chain, and two spaced pivoted arms on the side of the car that may be set to engage the sprocket chain, substantially as described.

2. In a cable car transferring device, the combination with a cable beneath a railway track and passing below a transverse cable, a chamber beneath the lowermost cable and its track, and an auxiliary chamber at one side of said track and parallel therewith, of an endless sprocket chain in the lateral chamber, rotatably sustained idler wheels supporting the endless chain which is depressed below the transverse cable, mechanism in the main chamber and in the auxiliary chamber adapted to receive motion from the lowermost cable and transmit it to the chain, and two spaced pivoted arms on the car which are loosely connected and that may be set to engage the chain, substantially as described.

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