

(No Model.)

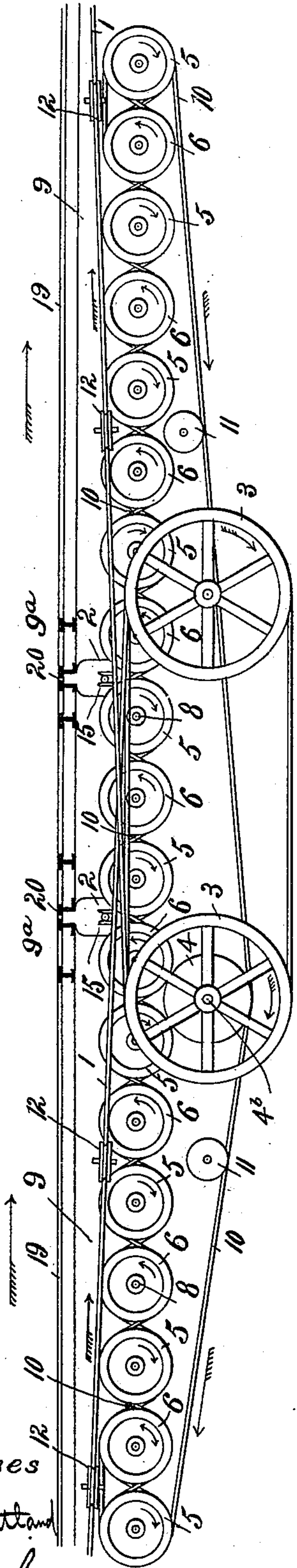
W. W. BAILEY.
CABLE CROSSING.

3 Sheets—Sheet 1.

No. 510,151.

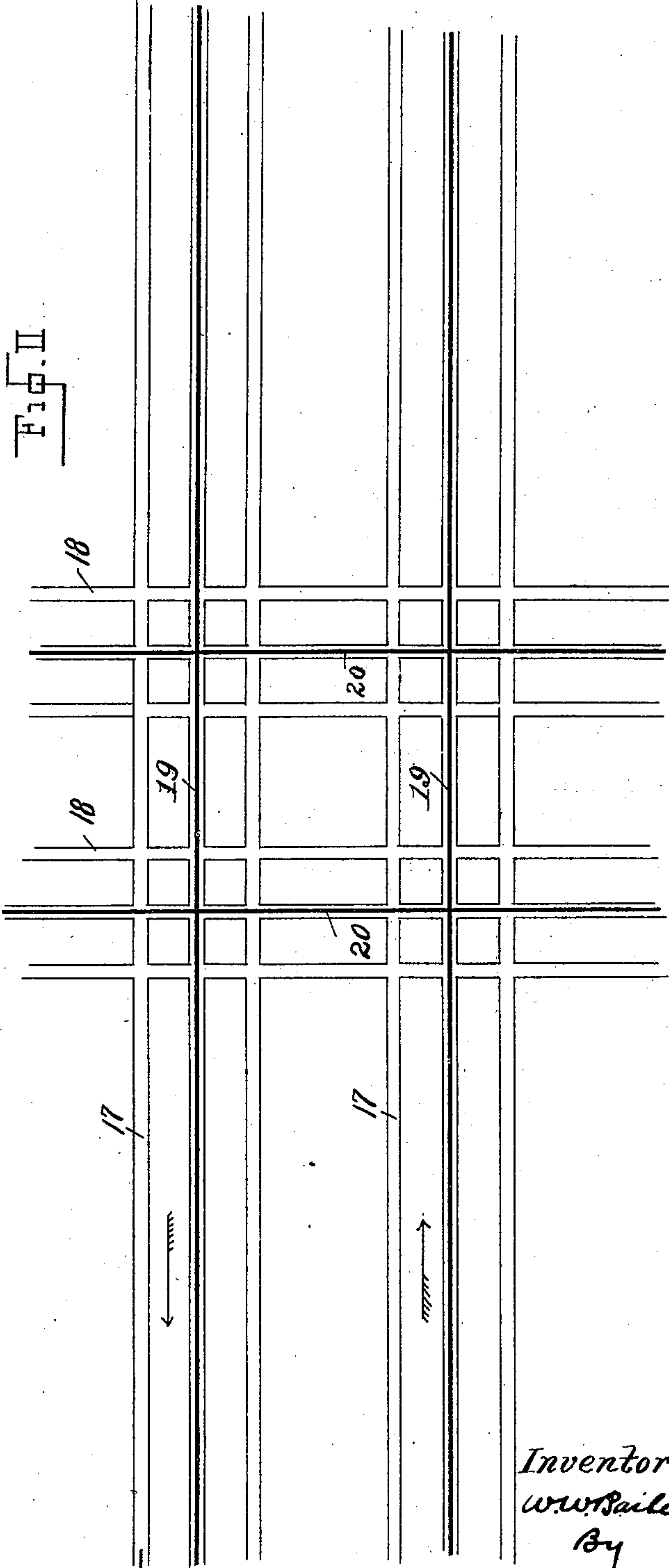
Patented Dec. 5, 1893.

FIG. 1.



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FIG. II.



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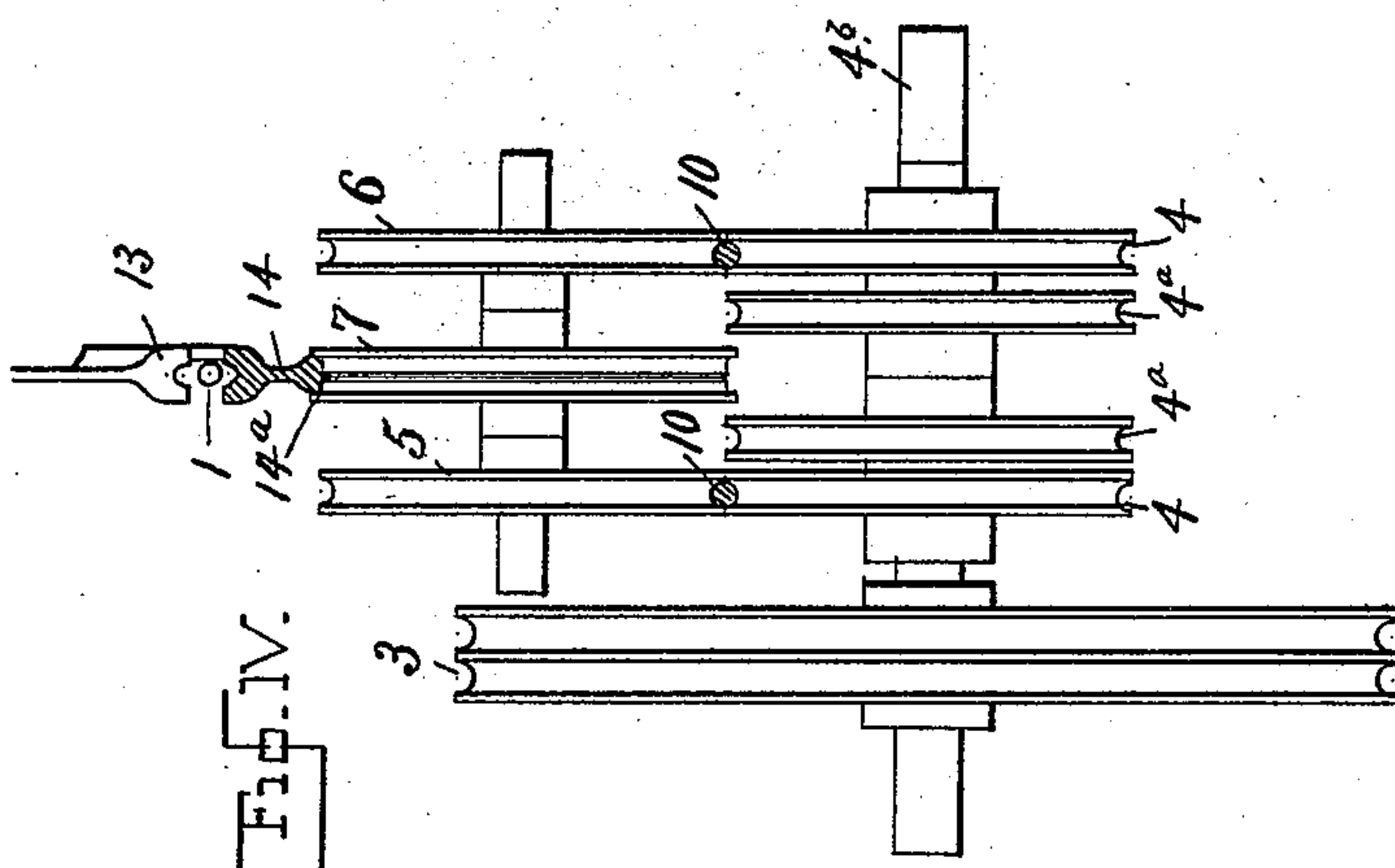
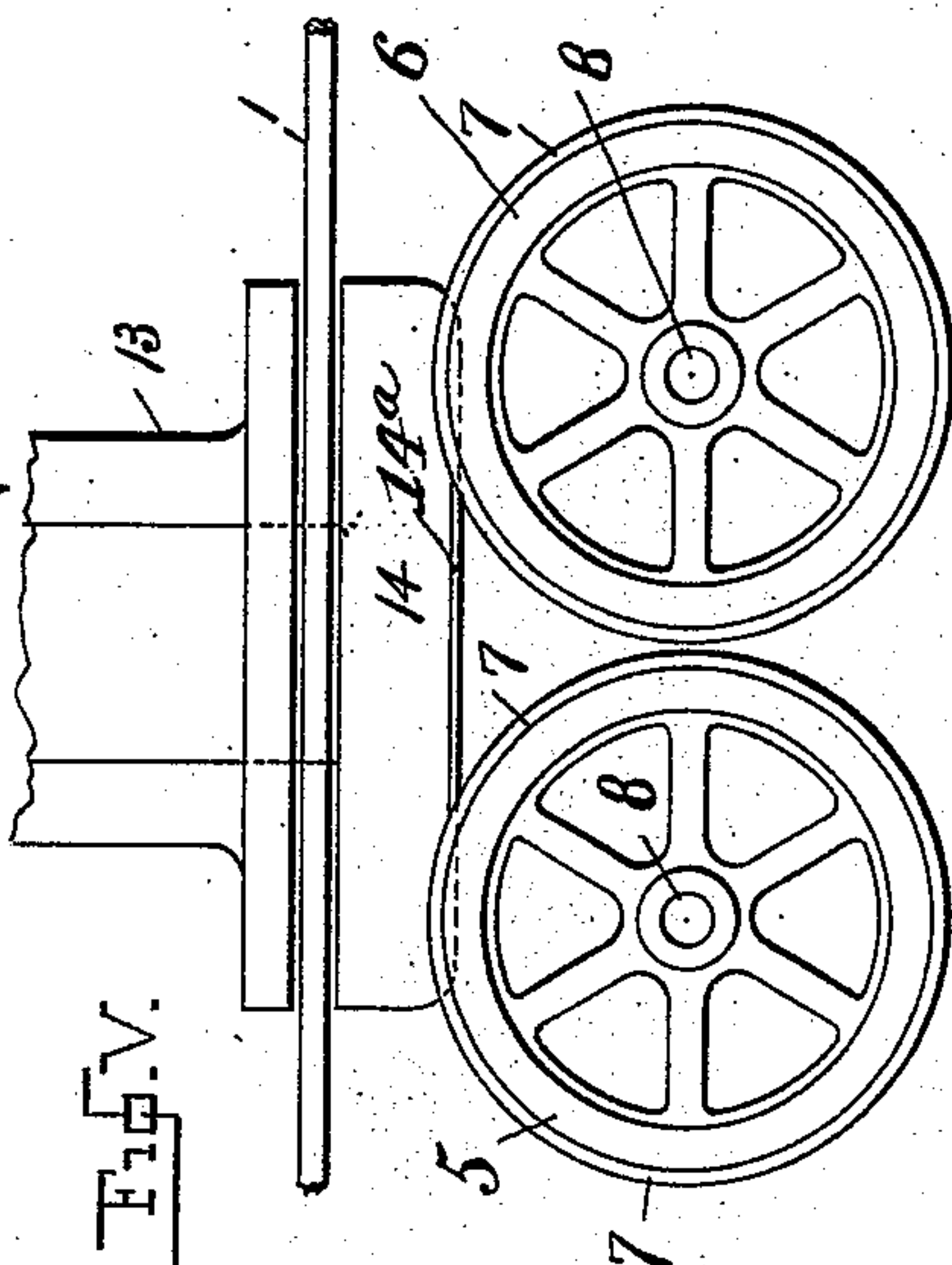
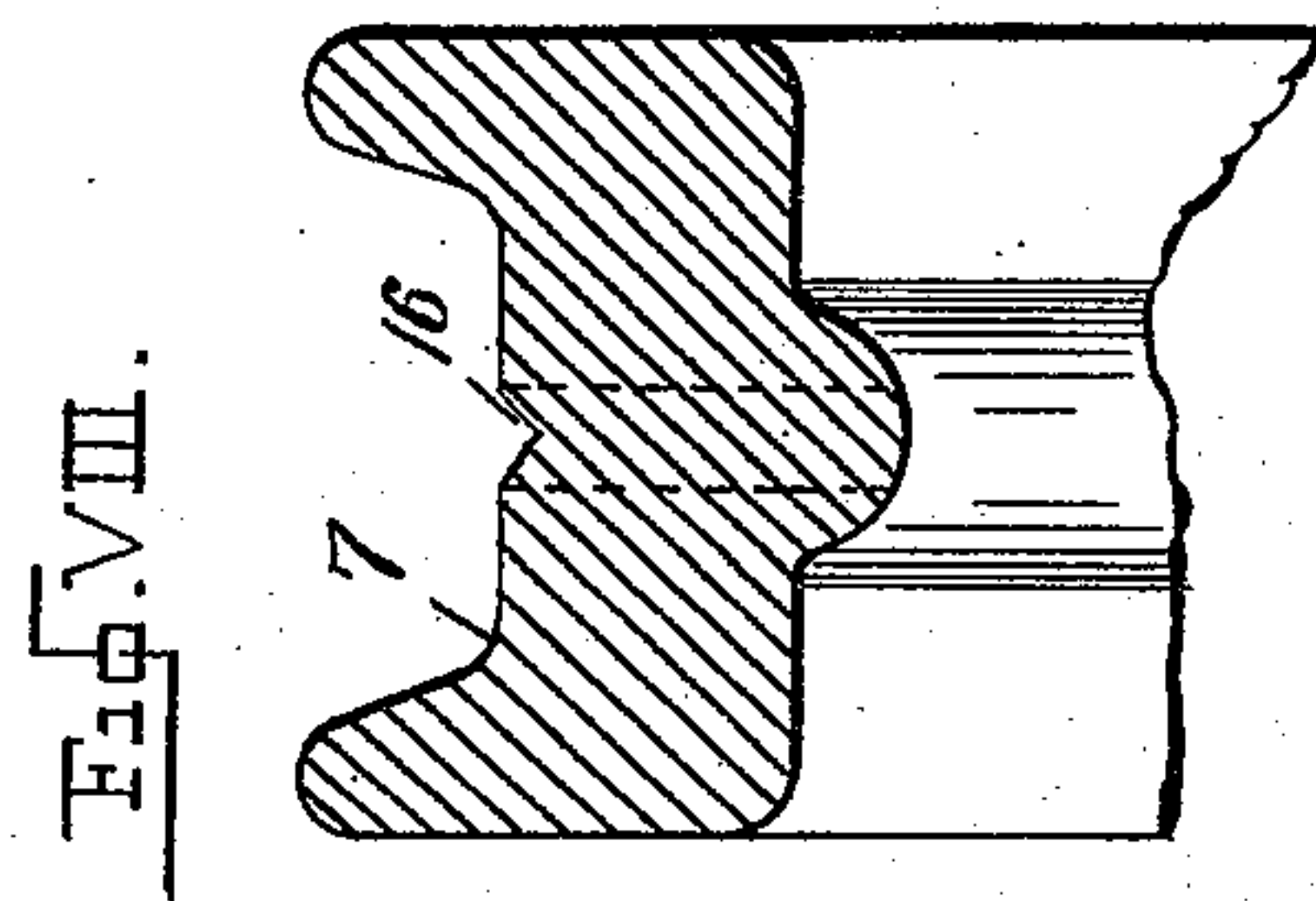
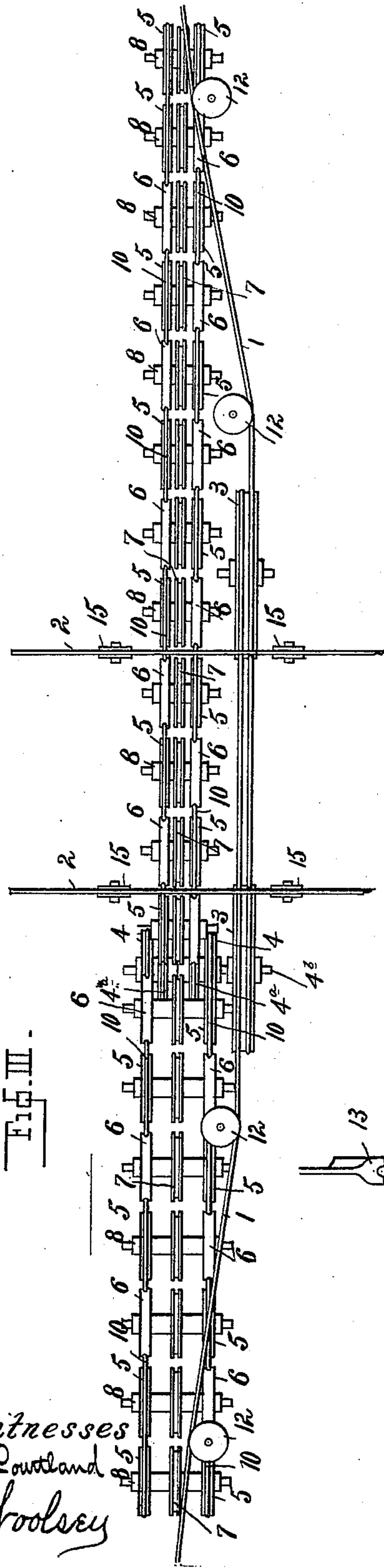
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W. W. BAILEY.
CABLE CROSSING.

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Patented Dec. 5, 1893.



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(No Model.)

3 Sheets—Sheet 3.

W. W. BAILEY.
CABLE CROSSING.

No. 510,151.

Patented Dec. 5, 1893.

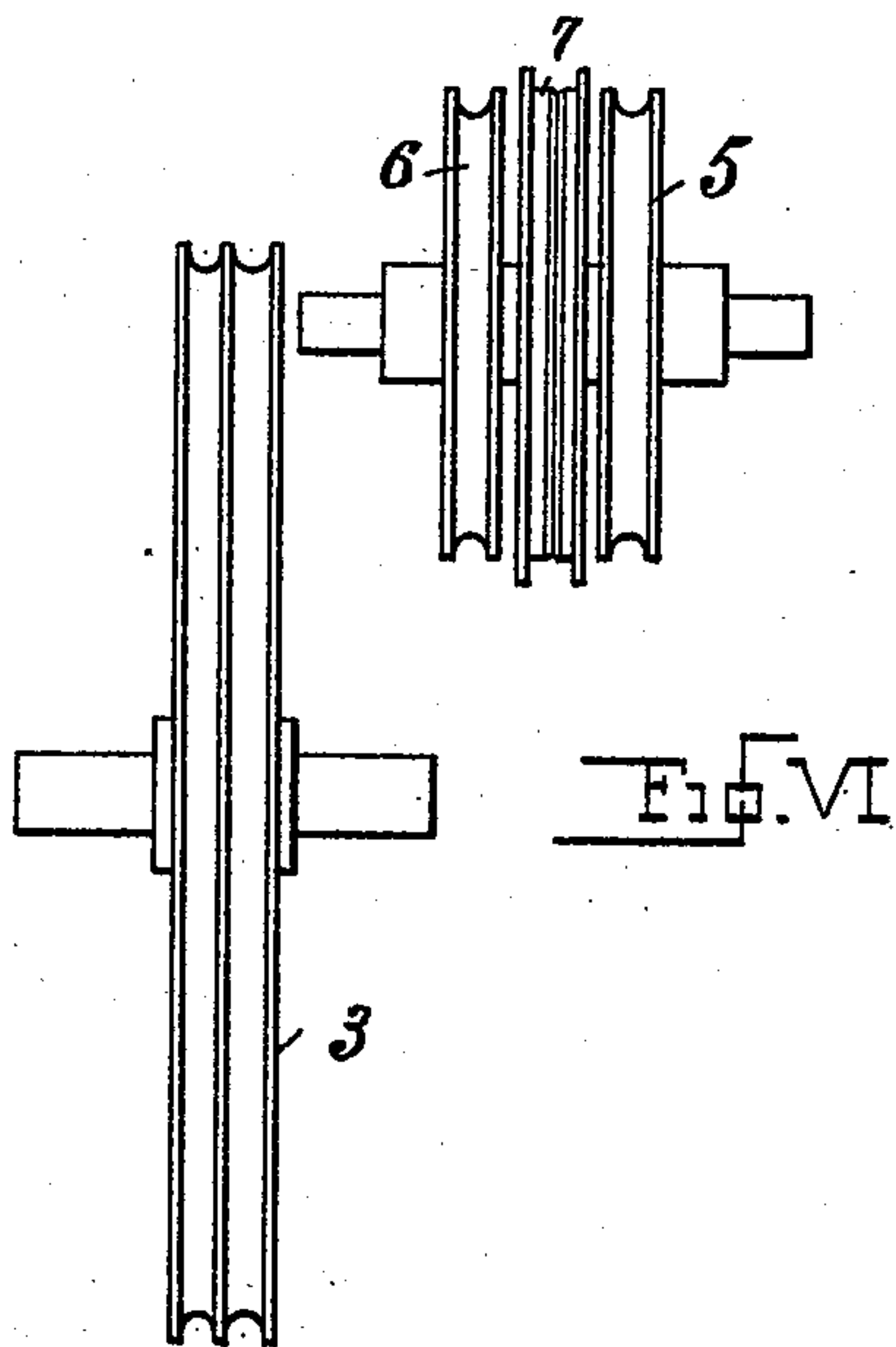


Fig. VI

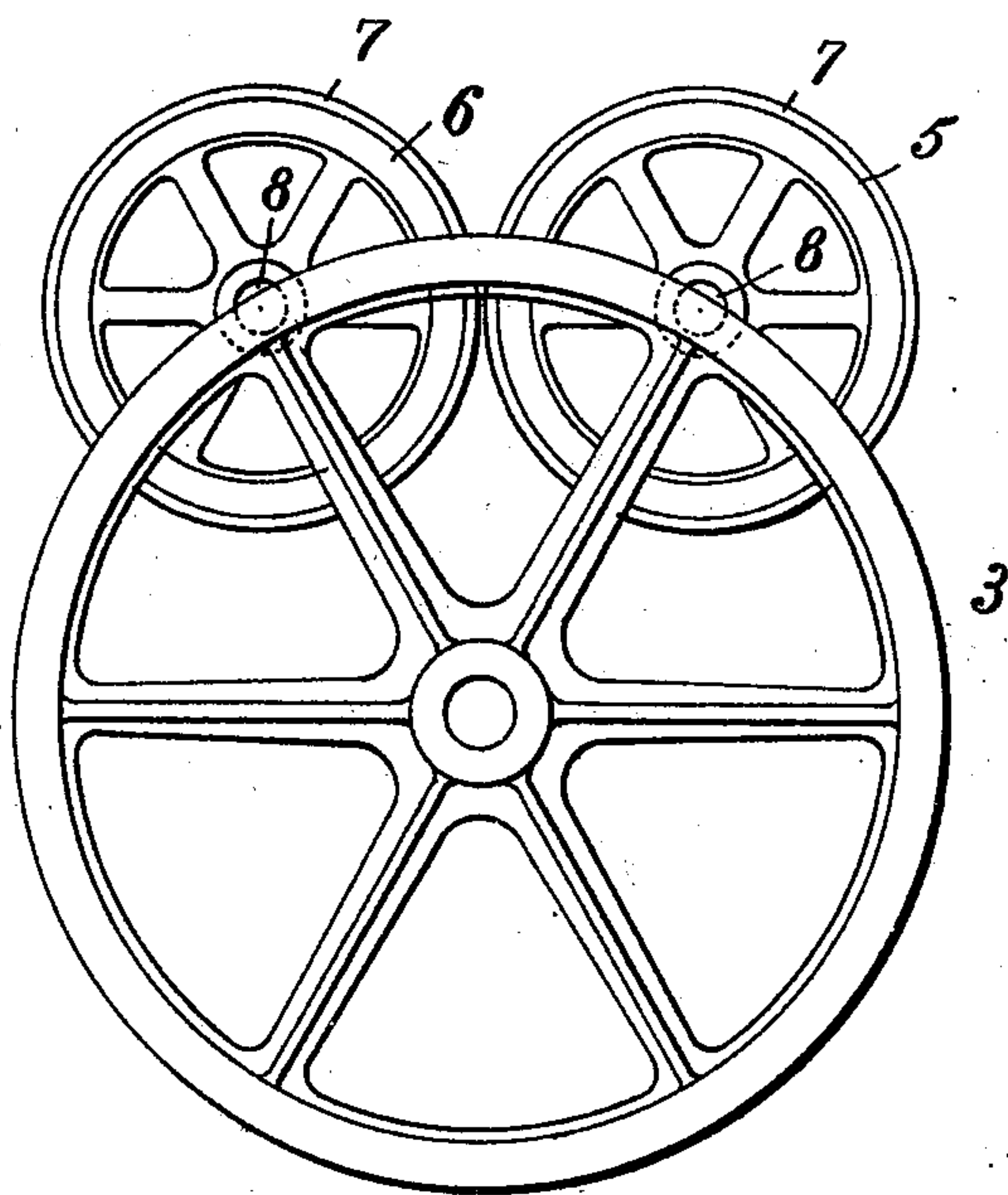


Fig. VII

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UNITED STATES PATENT OFFICE.

WILLIAM W. BAILEY, OF NEW YORK, N. Y.

CABLE-CROSSING.

SPECIFICATION forming part of Letters Patent No. 510,151, dated December 5, 1893.

Application filed December 24, 1892. Serial No. 456,285. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. BAILEY, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Cable Railways, of which the following is a specification.

My invention has for its principal object to provide an effective, practical and mechanical means for conveying cable-railway cars across other cable-railways running in the same or nearly the same plane as, and at an angle to, the first and consists of mechanism hereinafter described whereby the cars are propelled across the crossing by power derived from the main cable or other motor and it also provides means to enable the grip man when the grip connected to the car is released from the main cable to stop the car on any part of the crossing and to start the same again by power.

Another object of my invention is to provide effective mechanism for conveying the cars around curves without having the grip connected to the main cable, and also, for switching cars from one track to another by power, all of which I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure I is a vertical longitudinal section of a cable railway showing the driving mechanism at the intersection of the cross tracks, illustrating the manner in which the cars are propelled across the crossing. Fig. II is a plan showing the cross tracks on the surface. Fig. III is a sectional plan with the track cut away, showing the driving mechanism. Fig. IV is an end view of the main and auxiliary sheaves for driving the center rolls. Fig. V is a side view of the rolls, showing the way in which the shoe connected to the grip engages with the rolls. Fig. VI is an end view of the main and auxiliary sheaves. Fig. VII is a side view of the same. Fig. VIII is a sectional view of driving rolls showing form of tread.

1, 1 represents the main cable deflected to one side and running under the cables 2, 2 which are to be crossed.

3, 3 are the two main driving sheaves for

the auxiliary cables and here shown as driven by the main cable which passes around them.

4, 4, 4^a 4^a are the sheaves on the shaft 4^b of one of the main driving sheaves 3 for the purpose of driving the trains of sheaves 5, 5 which are keyed fast to the transverse shafts 8.

6, 6 are idlers or loose sheaves alternating with fast sheaves 5 on the series of shafts 8. The auxiliary cables pass alternately over a fast and under a loose pulley for the purpose of driving all the train of rolls in one direction and to enable them to be placed close together.

7 are the driving rolls made with double flanges and placed in the center of the tracks and directly under the slot through which the grip connected to the car passes.

8, 8 are transverse shafts upon which the sheaves 5 and rolls 7 are keyed fast and the idlers 6 run loosely. All of the shafts 8 are set in boxes placed upon suitable iron frames which rest on the foundations in the conduits.

9, 9^a are the conduits through which the respective cables to be crossed are laid as shown in Fig. I.

10, 10 are auxiliary cables passing over the sheaves 4, 4^a and 5 for the purpose of driving the rolls 7 on shafts 8. (See Fig. III, IV and VI.)

11, 11 are pulleys which hold down and tighten the four auxiliary cables 10, 10.

12, 12, 12, 12 are sheaves for the purpose of guiding and deflecting the main cable out of its direct line and to bring it in line to pass over the main driving sheaves 3, 3 which drive the train of rolls and also to release the main cable from the grip. When opened the friction shoe comes in contact with the tread of the rolls 7 for the purpose of propelling the car over the cross cables which are shown between and below the tread of the rolls 7.

13, Fig. V, shows the grip open and released from the main cable and having a shoe 14, connected to its movable part, so constructed that it can contact with two of the rolls simultaneously. See Figs. IV and V. I have shown the shoe in this case connected to the movable part of the grip, but it may be independent of the grip and connected to the car in any equivalent manner.

15, 15 are sheaves for the cross cables to

rest in to prevent them from chafing on the main cables 1, 1.

16 (Fig. VIII) is a V groove in the tread of the rolls 7 for the purpose of guiding the shoe 14 in a direct line of the slot on the surface and also to produce additional friction to propel the cars over the cross cables. The shoe has a V-shaped fin 14^a, see Figs. IV and V to engage in this groove.

17, 17 (Fig. II) are the up and down tracks of a double track railway. 18 are the cross tracks. 19, 19 are the slots on the said up and down tracks for the grip to run through and 20 the slots for the grip on the cross tracks.

The main cable 1, 1 being deflected down and to one side of the center lines, passes around the main driving sheaves 3, 3 (Figs. I and III) which in this case drive the train of rolls 7, 7 by means of the cables 10, 10 passing over the sheaves 4, 5, and under idlers 6 on one side and directly opposite on the other as will be seen in sectional plan, Fig. III which enables me to drive all the trains of rolls in one direction over the crossing.

The sheaves 4, 4, 4^a, 4^a are keyed fast to the shaft that carries the main driving sheave 3 and the sheaves 5, 5 are keyed fast to the shafts 8 as are also the rolls 7 while on each shaft 8 is an idler or loose sheave 6 on the opposite side of its fast sheave 5 and as will be seen by an inspection of the drawings the fast and loose pulleys alternate with one another on each side. By this construction I am enabled to place the driving rolls 7, 7 close to each other only having sufficient space to permit the cables to pass over one and under the other. By placing the rolls close together it also enables me to have a shoe on the grip engaging with two rolls at the same time and not much longer than the grips which are now in use on cable railways. Having laid the drawings down to scale, I find that three three-foot sheaves and rolls can be placed between the slots of the two tracks of a double track crossing.

The rolls 7, 7 can be made with chilled treads, or with steel tires, having double flanges to prevent the shoe from crowding to one side which would wear the plates of the grip by coming in contact with the sides of the slot rails. The V in the tread acts as a guide and increases the friction as the shoe has a projection to fit in same, and both come in direct contact with the tread of the rolls.

The frames and journal boxes for the main driving sheaves 3, 3, sheaves 5, idlers 6 and driving rolls 7 on shafts 8 are not shown on the drawings as they can be made of any suitable form well known to mechanics. Neither are the walls and chambers around the driving machinery shown in the sectional plan, Fig. III, as they can be made to conform to the conditions of the road bed.

The tighteners 11, 11 are intended to be adjustable in a manner common to belt-tightening rolls for the purpose of taking up the

slack of the auxiliary cables 10, 10 which drive the train of rolls. The main cable 1, 1 being gripped, the car approaches a cable road running at an angle with it, the cross cables passing over the one which is gripped. When the car arrives at the point where the main cable is deflected, and directly over the rolls 7, the grip-man releases the cable which having more or less strain upon it from being deflected from a direct line, passes out of the grip and strikes one of the outer rolls 12. The grip being opened wider, the movable jaw is thrust down and the shoe 14, which in this case is connected to the grip, comes in direct contact with the tread of the rolls 7, 7 with sufficient friction to propel the car over the cross cables 2, 2. If there should be an obstruction upon the track before the car arrived at the crossing, or, if a car be passing over the crossing, the grip-man raises the shoe by the same lever that is connected to the movable part of the grip, releasing the shoe from contact with the rolls 7, 7 and by applying the brakes, stops the car and so prevents serious accidents on the crossings. When the obstruction is removed, the grip-man lowers the shoe again until it comes in contact with the rolls 7, 7. Then the car starts and is propelled over the cross cables.

I do not confine myself to driving the train of rolls 7, 7 by auxiliary cables as they may be driven by friction rolls, or gearing placed between them in place of the sheaves. The tread of the rolls may be made flat without the double flanges.

The driving rolls may be placed on a curve and be driven by the main cable or otherwise, and be arranged in such a manner that the shoe can be brought in direct contact with them with sufficient friction to propel the car around the curve and at the same time relieve the main cable from the very great strain to which it is subjected when it travels on guide rolls placed in the conduit around the curve.

The train of rolls can be placed under turn-outs where cars are switched from one track to another, the shoe coming in contact with the rolls the same as they do on the crossings.

The train of rolls may be driven by some other power than from the main cable; therefore, I do not limit myself to driving them from the main cable.

It will be noticed that the grip-man, by depressing the shoe with sufficient force can throw any necessary part of the entire weight of the car onto the shoe for the maintaining of a frictional contact with the friction devices hereinbefore referred to as the driving rolls; and that connection of the shoe to the driving rolls is nevertheless so free that to release their action, the grip-man has but to raise the shoe from contact; and that, the action being against the top of the frictional devices, any wear of any of the parts does not in the least affect the perfect operation

of the mechanism being fully compensated for by a slightly greater depression of the shoe with merely a slight increase of the throw of the grip-man's lever.

5 Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In combination with a cable railway, having a portion of the length of its cable deflected to pass an obstacle, and a car having a grip arranged for operation in connection with the cable of said railway; the herein-described auxiliary propelling mechanism, located at such place of deflection for carrying the car over the obstacle, consisting of the traveling frictional devices having transverse vertically presented frictional driving faces, in a line with the main portion of said cable and the vertically movable contact device carried on the car in line with the grip and having a corresponding transverse frictional contact face adapted to be forced vertically upon the traveling devices, substantially as and for the purpose set forth.

25 2. In combination with a cable railway having a portion of its cable deflected to pass an obstruction and a car having a grip for operation in connection therewith; the herein-described auxiliary propelling device, which consists of the continuously traveling vertical friction sheaves having transverse upwardly presented frictional working faces located at the point of deflection and in a line with the main direction of the cable, and the shoe carried on the grip having a horizontal downwardly presented frictional contact face arranged to make frictional propelling contact with the friction sheaves by vertical pressure downward, all substantially as and for the purpose set forth.

3. In combination with a cable railway having a cable deflected in a portion of its line of travel to pass an obstruction and a car operated thereon, provided with a grip consisting of the fixed upper jaw, and the lower jaw movable vertically for picking up and gripping the cable; an auxiliary propelling device consisting of a series of vertically arranged friction rolls located in the roadway and having vertically presented frictional peripheries in a line with the main direction of the cable and a shoe carried by the said lower vertically movable jaw of the grip and having a downwardly presented contact face in working relation to the peripheries of the rolls, and arranged to make driving frictional contact therewith by downward pressure, whereby when the grip is opened and the cable

released the auxiliary propelling device is actuated by the same operation, as explained. 60

4. In combination with a cable railway and a car arranged to be propelled thereon; the driving cable suitably guided centrally along the railway and having a portion of its path deflected laterally out of the general line of travel, the auxiliary propelling device located in the main line of the cable at the place of such deflection and consisting of the longitudinal series of vertical sheaves rotated on horizontal axes and having vertically presented transverse friction-driving peripheries, and a grip upon the car carrying upon its movable jaw a friction-shoe having a downwardly projecting transverse face arranged to co-operate with the friction faces of the sheaves; whereby the cable is released from the grip when arriving at the point of deflection and the car is propelled at such point by the friction-sheaves, substantially in the manner explained. 80

5. The combination in a cable railway, of the main traveling cable, a car adapted to be gripped thereto and having a depressible projection or shoe, main driving shafts, driving sheaves carried thereby, auxiliary driving rolls, shafts carrying said rolls, fast and loose sheaves carried by each shaft and alternating as described, and auxiliary driving cables arranged and adapted to operate substantially as and for the purposes set forth. 90

6. In combination with a cable railway and a car arranged to be propelled thereby; the driving cable suitably guided along the railway and having its path deflected for a portion of the way to one side and out of line with the main portion of the cable, the auxiliary propelling device located in the road at the point of deflection of the main cable and consisting of the longitudinal series of driving sheaves rotating on horizontal axes and having upwardly presented transverse friction surfaces arranged in the main line of the cable, and a driving sheave or sheaves having connection with said friction-sheaves and located in the line of the deflected portion of the cable and in working relation to be driven thereby, and a shoe carried by the car and having a downwardly presented transverse surface in working relation with the friction rolls, all substantially as and for the purposes set forth. 110

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Witnesses:

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