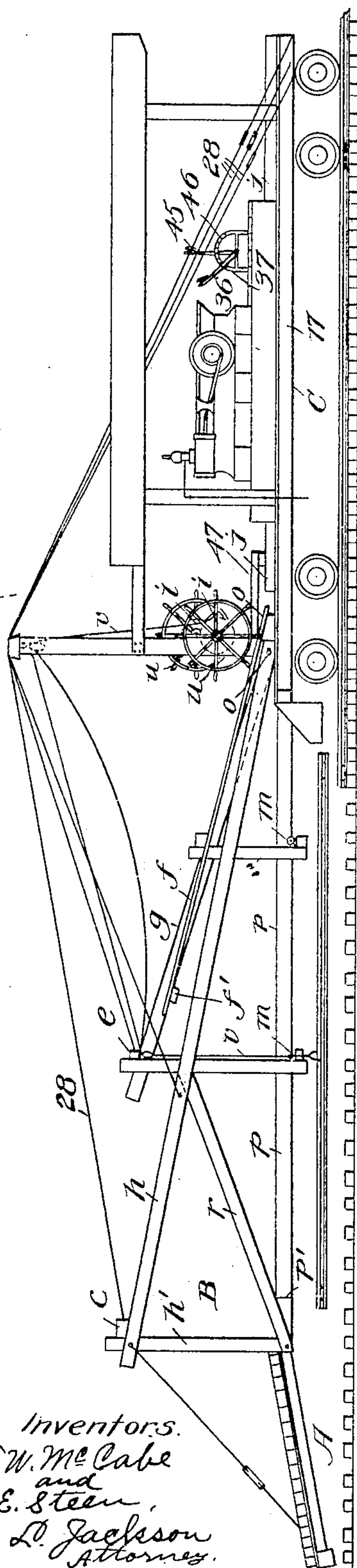
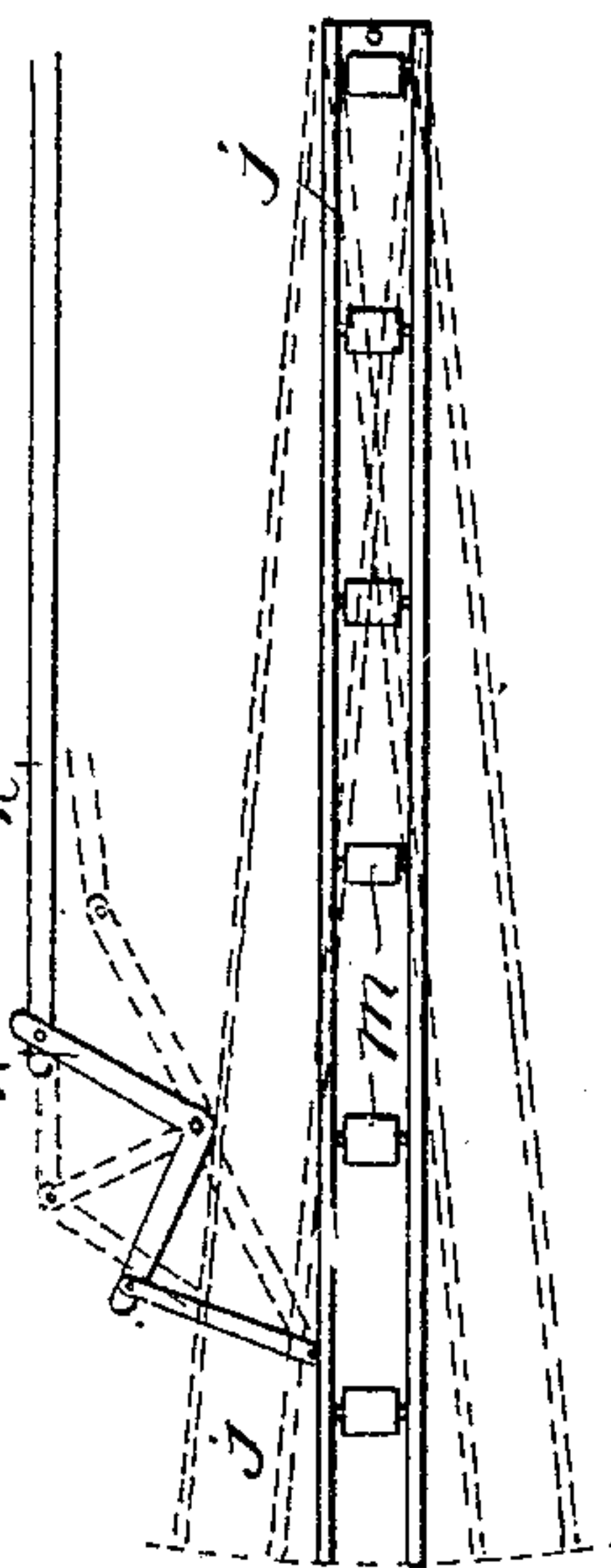
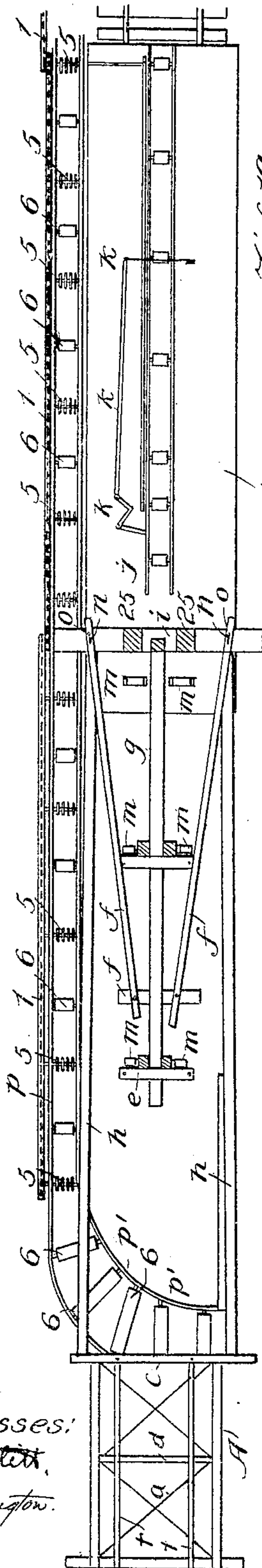


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# TRACK LAYING MACHINE.

APPLICATION FILED AUG. 26, 1905.

4 SHEETS--SHEET 1.



Witnesses:  
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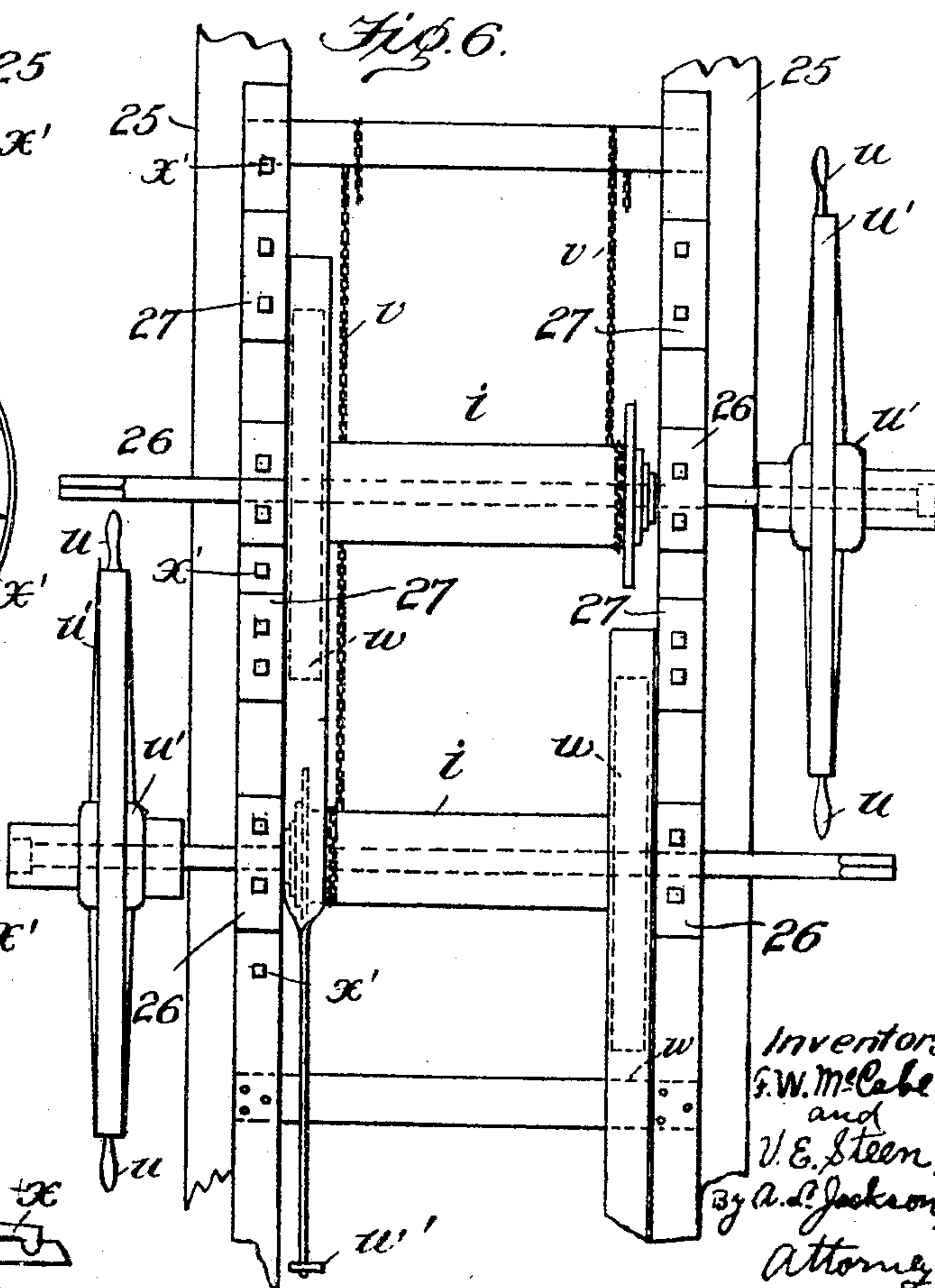
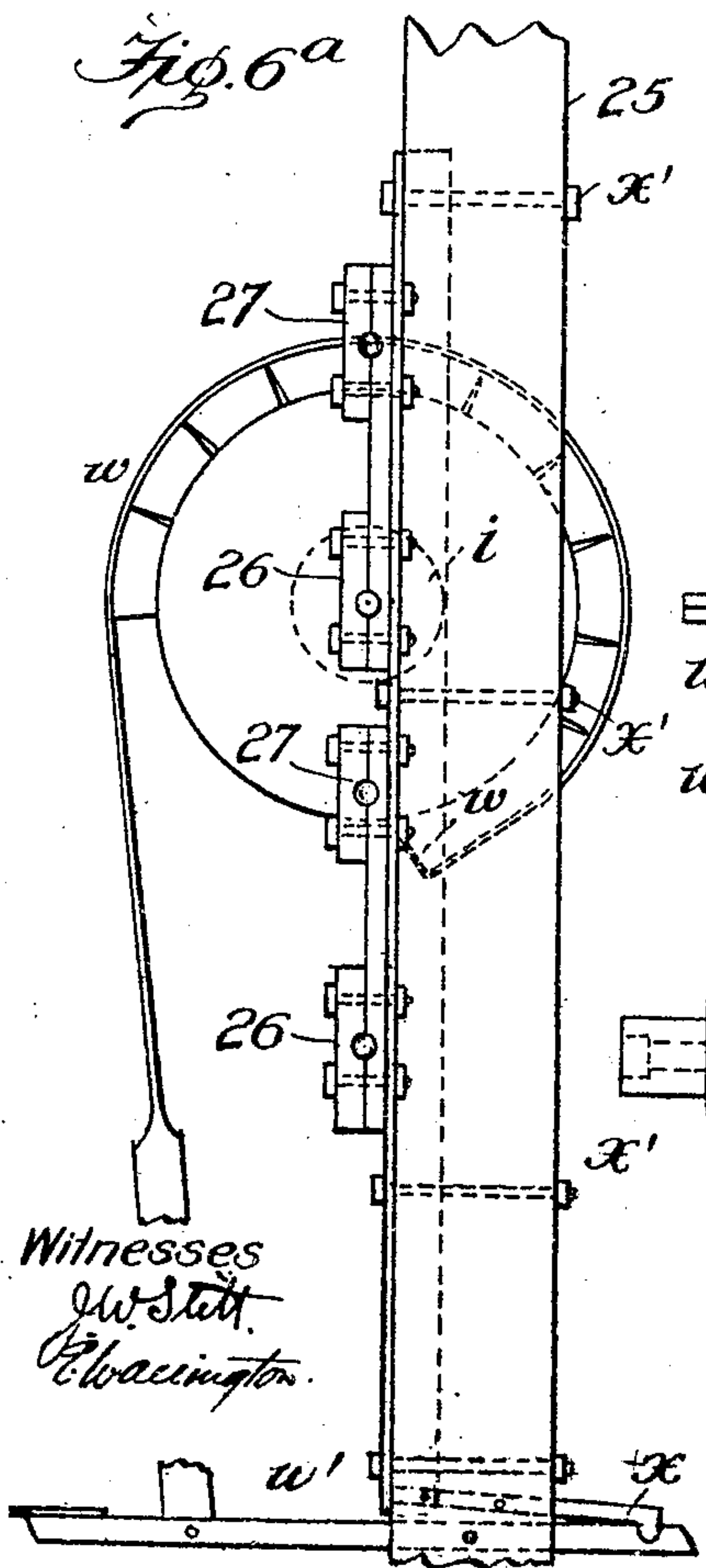
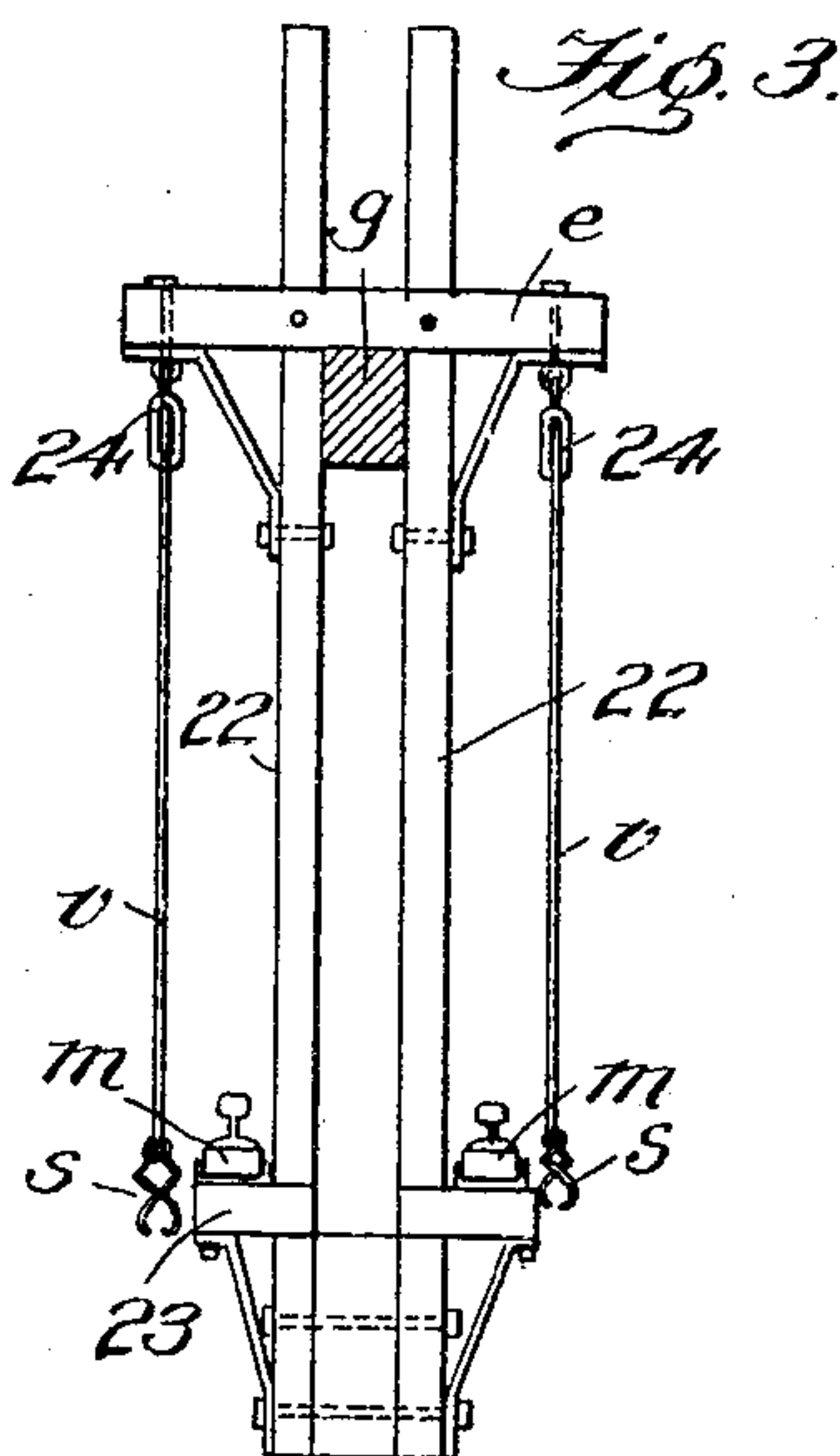
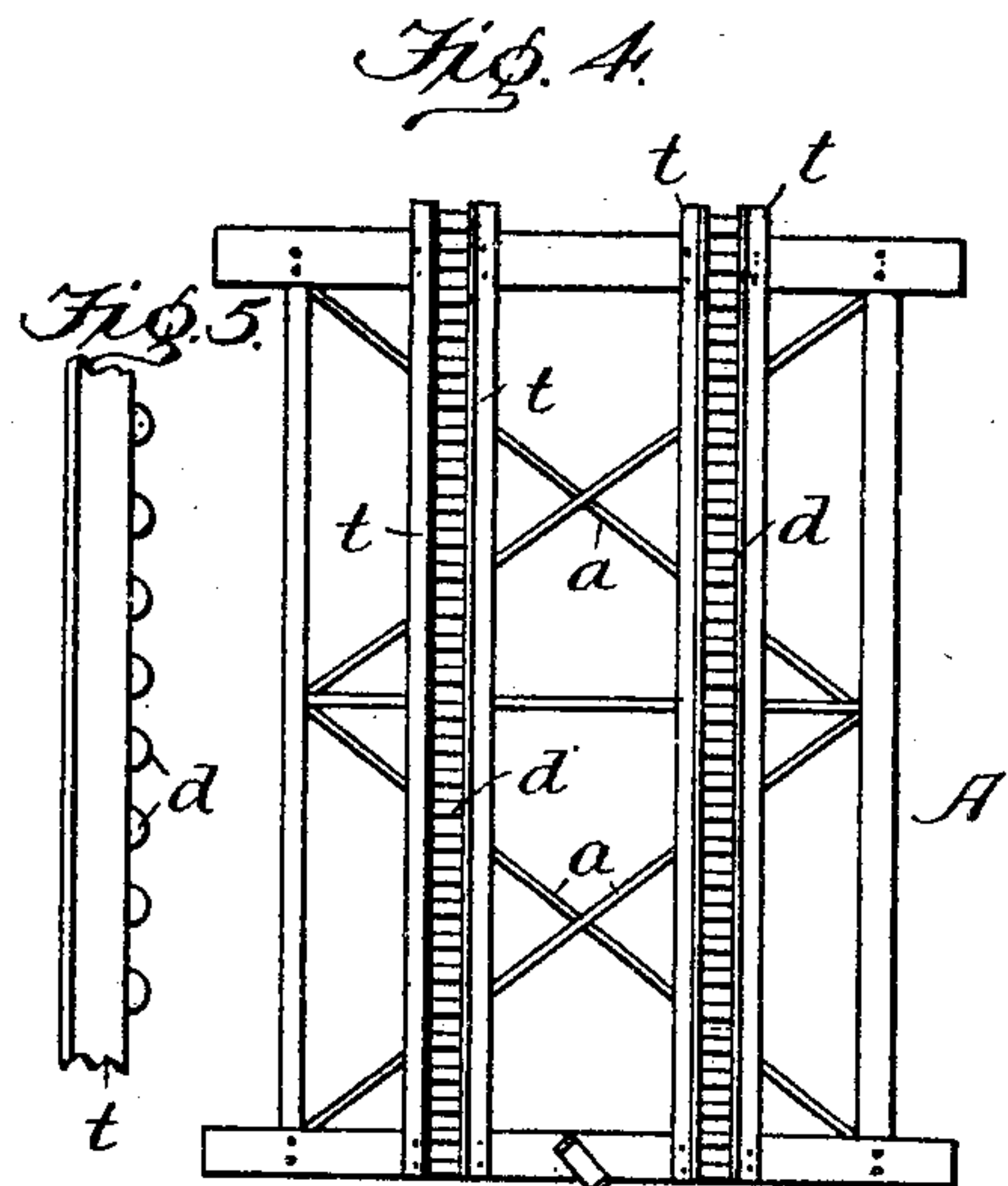
PATENTED NOV. 28, 1905.

F. W. McCABE & V. E. STEEN.

TRACK LAYING MACHINE.

APPLICATION FILED AUG. 26, 1905.

4 SHEETS—SHEET 2.



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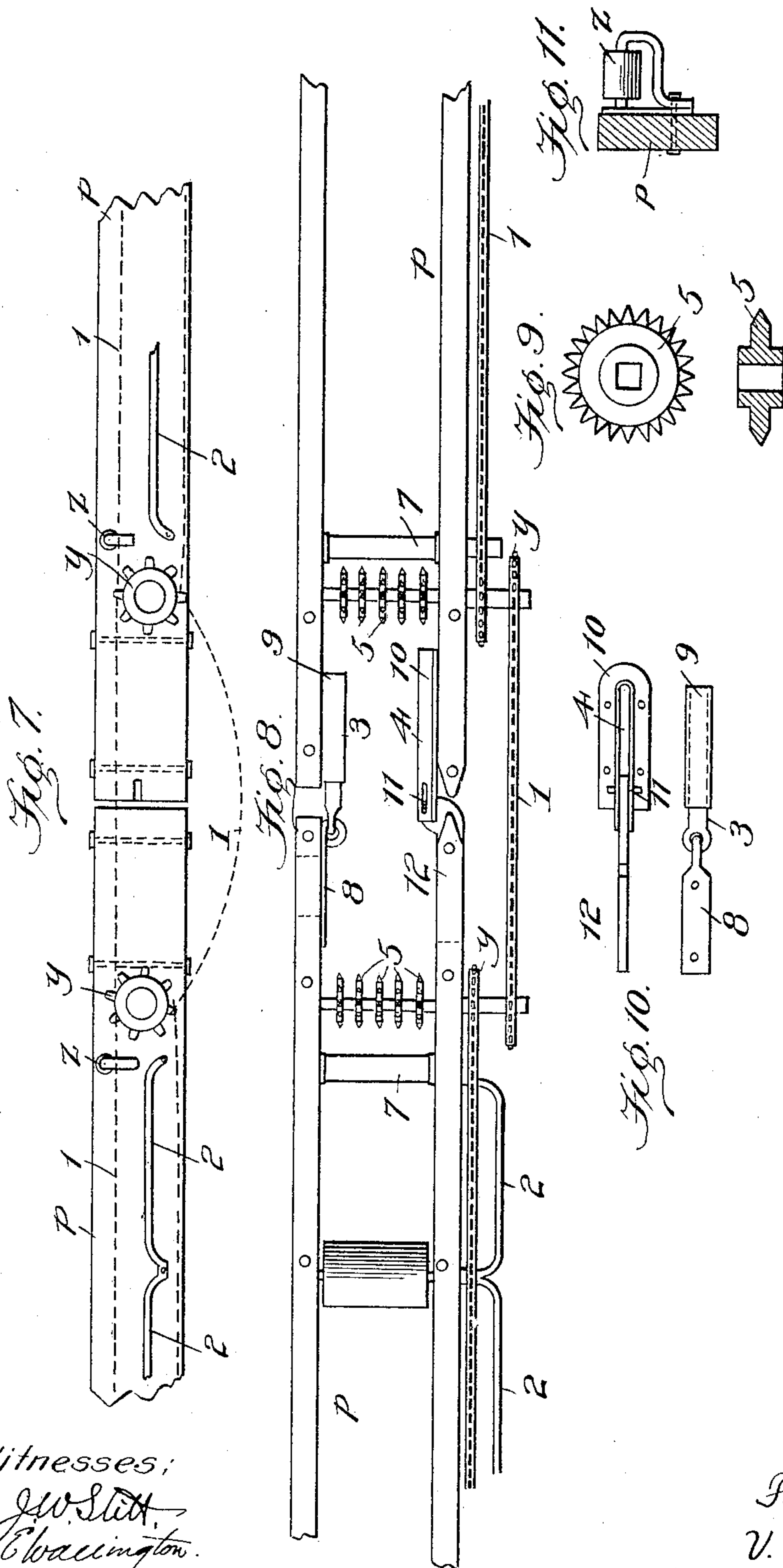
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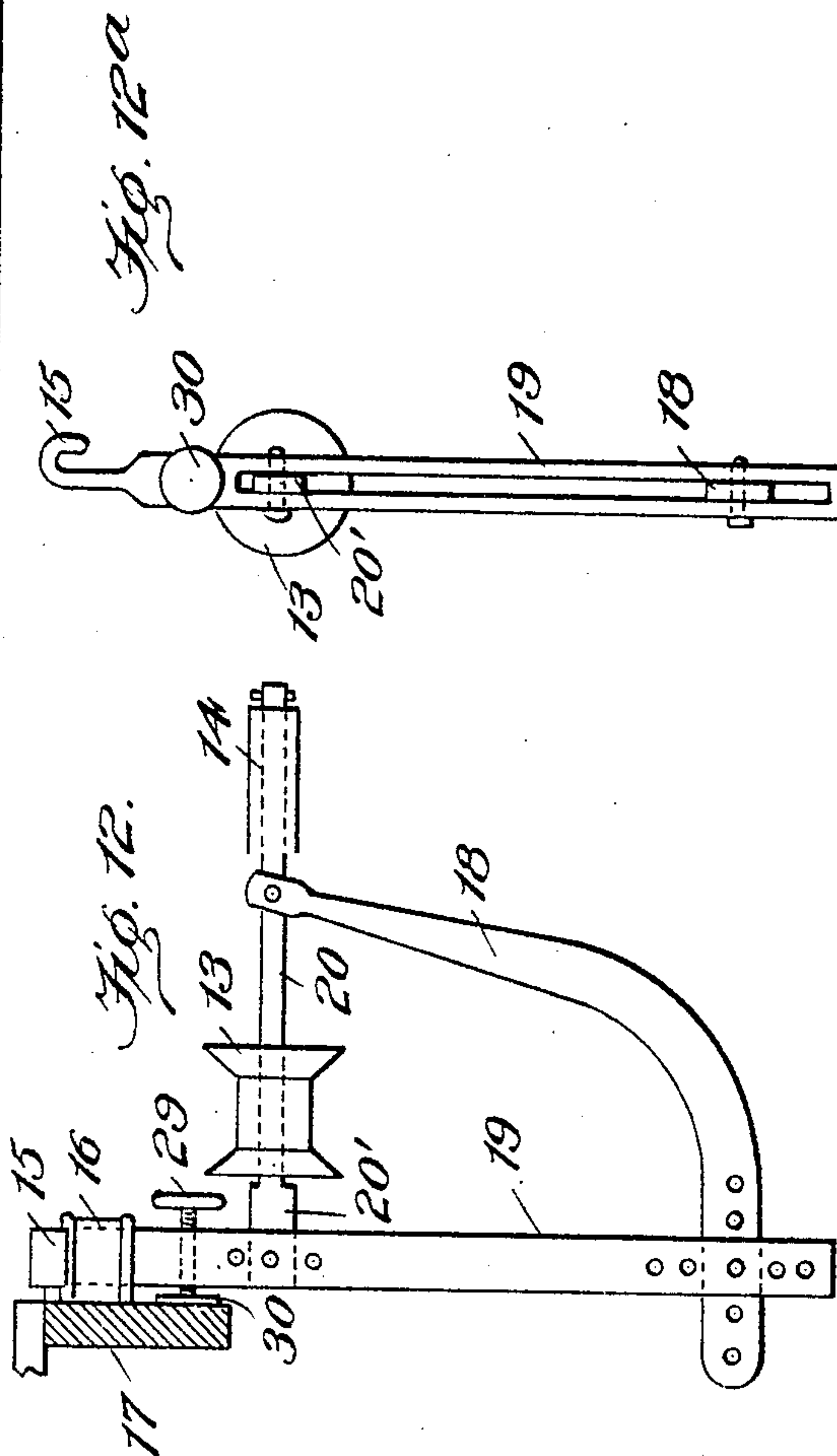
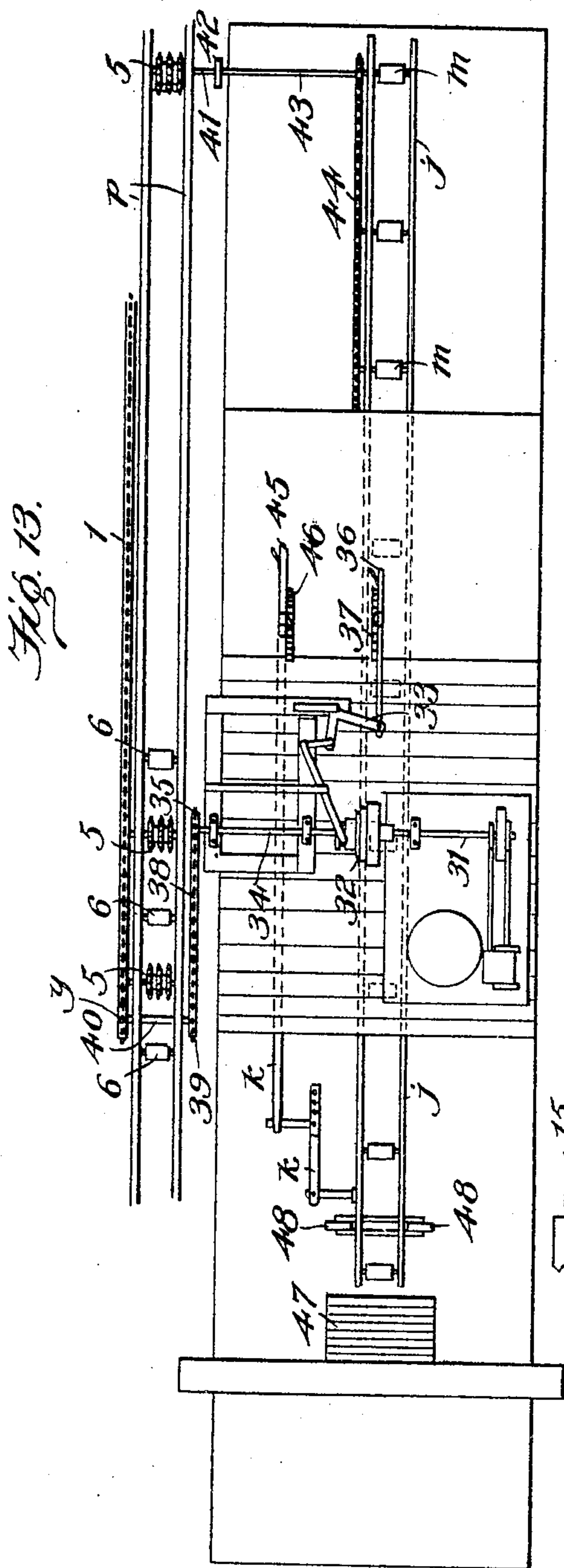
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TRACK LAYING MACHINE.

APPLICATION FILED AUG. 26, 1906.

4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

FRANK W. McCABE, OF CAIRO, ILLINOIS, AND VERNON E. STEEN, OF  
KANSAS CITY, MISSOURI.

## TRACK-LAYING MACHINE.

No. 805,808.

Specification of Letters Patent.

Patented Nov. 28, 1905.

Application filed August 26, 1905. Serial No. 275,960.

*To all whom it may concern:*

Be it known that we, FRANK W. McCABE, residing at Cairo, county of Alexander, State of Illinois, and VERNON E. STEEN, residing at Kansas City, county of Jackson, State of Missouri, citizens of the United States, have invented certain new and useful Improvements in Track-Laying Machines, of which the following is a specification.

Our invention relates to devices for laying the track members, such as rails and cross-ties, of railway-tracks, and particularly to that class in which the ties and rails are carried on cars and advanced to the front of the train as fast as needed by means of trams arranged along the sides of and down the center of the cars, and has for its object the laying and construction of railway-tracks in a more rapid, economical, and successful manner than heretofore accomplished, this being made possible by the following improvements over machines heretofore invented.

First. The construction of our tramway in sections, easily handled by a small force of men and placed along the sides of the cars and supported by triangular trusses which are made adjustable, so as to hold the tramway in a horizontal position on the side of any car. The whole of this tramway, which in our machine is in use carrying the ties to the front, is applicable to the carrying of either ties or steel and is so arranged, as shown in accompanying drawings, as to be easily and speedily removed from or attached to cars in train carrying track material to be distributed in position along the graded surface.

Second. The construction of a rail run or chute through the center of the machine-car, which, with suitable attachments, provides a rail-run forward to extreme point of end of next rail required, and means are provided whereby a rail can be easily shifted to either side of forward end of car by one man.

Third. The construction and operation of a boom which extends beyond the forward end of the car and a line lowered from same, with a hook attached which can be hooked to center of a rail whereby the rail may be raised from roller-run and lowered into exact position in the track.

Fourth. The construction and operation of a forward tie chute and apron extended ahead of the machine-car a distance sufficient to dis-

tribute the ties ahead of the front of the machine as the machine is moved forward.

Fifth. To provide motive power to operate the rollers in the side trams for the purpose of carrying the ties forward, which is accomplished by means of a motor placed on the machine-car and connected by friction-clutch and shaft with sprocket-wheel placed on side of machine-car in such position that sprocket-chains extending over other sprocket-wheels for the full length of trams are given motion by means of the operation of the motor.

Sixth. To provide the booms and outriggers supporting the forward end of the machine with suitable side timbers to support the carrying apparatus forward of the machine-car, the boom being arranged so as to be shifted to right or left side to provide for any degree of curvature required.

Seventh. To provide a system of guys and hog-chains with turnbuckles for the purpose of taking up or letting out slack as required, to support overmast placed at the forward end of the car or to support that part of the apparatus which extends forward of the end of machine-car, together with load of material, and other economical and expedient means of laying track by means of apparatus hereinafter fully explained, and more particularly pointed out in the claims.

Reference is had to the accompanying drawings, which form a part of this application and specification.

Figure 1 is a plan view of the machine, showing the position of the machine-car without the motor and cover, the position of the side trams and means of operating the same, the position of the center run to deliver rails to position for laying track, system of levers to adjust forward end of rail-run or center run to either right or left side of machine, as required, and manner of connecting the rollers in center tramway and gearing therefor, the position of gallows-frame and the boom for raising and lowering rails into position, the position of crabs used in connection with rail-boom, the gallows-frame supporting the forward trams and tie-apron, the tie-apron, together with inclined dolly-run and manner in which apron is braced, the long bolt-holes in the ends of adjustable side timbers which form stiff legs attached to boom for the purpose of adjusting the machine to degree of



curvature required, either right or left. Fig. 1<sup>a</sup> shows the forward end of the center run or rail-delivery tram and levers for shifting or adjusting the same either to the right or to the left. Fig. 2 is a side elevation of the machine, showing the manner in which ties are distributed on the tie-apron after reaching the end of the tie-trams on the side for one panel ahead of extreme end of machine at any time and showing position of rails for the first panel ahead of machine just before being heeled into final position, the system of trusses, guys, and hog-chains supporting that part of the device carried ahead of the machine-car, the position of crab used in removing rails from rollers and lowering the same into position, the levers used in shifting the forward end of the rail-run to deliver the rails to either right or left side of forward end of machine-car. Fig. 3 is a front elevation of the boom, showing the cables, two of which are employed, extending downward, one from near each extreme end of boom, together with hooks and pulley-blocks and manner of attachment used in placing rails into position and the dollies on which steel rails are carried forward, the position of rails when first delivered forward of machine-car ready to be hooked onto the grabs and lowered into position, and the general plan of bracing these parts. Fig. 4 shows in detail the apron used in storing and distributing ties from the forward end of the machine, the dolly so placed as to turn the ties at right angles to the line of track, and the plan of bracing this apron. Fig. 5 is a detail view of the rollers and the inclined tie-apron. Fig. 6 is a broken elevation of the mast, showing in detail the arrangement of crabs attached to the masts of the gallows-frame at the forward end of the machine-car, which are used to remove the rail from the center run or center tramway. Fig. 6<sup>a</sup> is an edge or side view of the devices shown in Fig. 6, showing the attachment of the friction-brake, foot-lever used in tightening the brake, steel spring used for releasing the brake, and boxing and bolt attachment by which the two crabs are attached to the masts at the forward end of machine-car. Fig. 7 is a side view of two broken tramway-sections, showing the manner of connecting the tram-sections, also position of sprocket-wheels and chains which give motion to rollers on inside of trams, and a smaller roller attached to side of the tram, which roller is used as a guide to hold the sprocket-chain in direct line with sprocket-wheel. Fig. 8 is a plan view of connection of trams from one car length to another, a top view of the sprocket-chains and sprocket-wheels, the propelling-rollers on inside of tramway, and the manner of bracing and connecting the tramways. Fig. 9 illustrates diamond-toothed wheels, which are placed, as shown in Fig. 8, in a series of five, more or less, on each shaft for the purpose of driving

ties to forward end of the train. Fig. 10 is a detail view showing the manner of connecting trams from one car length to another, with a device so arranged as to be flexible and permit motion of cars, to which trams are attached, around curves without breaking the connections. Fig. 11 illustrates a guide through which the sprocket-chain passes and by use of which the sprocket-chain is kept in direct line with the sprocket-wheels. Fig. 12 is a side elevation of an adjustable truss, which is hung to pocket on side sill of an ordinary car, and shows by a series of holes the manner of adjusting the truss so as to bring the roller-shaft into horizontal position regardless of the angle at which the upright part hangs and also shows inside roller on which tramway rests, permitting the same to move forward or backward and preventing the tramway from slipping either inward or outward, thus causing the tramway to run parallel with the car at a fixed distance therefrom. Fig. 12<sup>a</sup> is an edge view of the truss shown in Fig. 12. Fig. 13 is a plan view, on a larger scale, of motor and steel-rail run and system of levers used for shifting the forward end of the steel-rail run, and showing the gearing of the tramway to the motor and levers for throwing the gearing in and out of operative relation.

Similar characters of reference are used to indicate the same parts throughout the several views.

The operation of laying railway-track is most economically carried on with a train of cars and a machine-car in front of the train of cars. The rails to be laid are preferably placed on one or more cars next to the machine-car—that is, cars loaded with rails are arranged next to the machine-car. A dolly roller-run is placed along through the center of these cars, on which rails are forwarded to corresponding rollers set through the center of the machine-car. The steel rails loaded on these cars are evenly distributed on each side of the roller-run and are placed on sills, so that the steel rails are elevated sufficiently to be dropped down on the rollers. After the cars loaded with rails, there are several cars loaded with cross-ties, and the engine is located in the rear. The train thus assembled proceeds to the front or point where track is to be laid. Our invention consists in the improved means for forwarding the ties and rails and distributing the same where they are permanently located.

At the extreme front of the apparatus herein described is a tie-apron for storing and distributing ties. This tie-apron consists of a rectangular frame A, connected to outrigging portion B, angle-bars *t*, bolted to frame A, and antifriction-rollers *d*, journaled in the angle-bars *t*, which are pivotally connected at rear end to outrigging portion B. The frame A is provided with suitable braces *a*. The out-



rigging portion B is attached to the machine-car C. The gallows-frame is provided with side pieces *h*, with the rear and lower ends attached to the machine-car and the front ends elevated and connected with upright frame-pieces *h'*. On the sides this frame is provided with braces *r*, which prevent the tie-apron from swinging backward. The tie-tram *p* extends along the sides of the cars, and the front end *p'* of the tie-tram is curved, so that the ties may be brought across the tie-apron, and a dolly *b* coöperates with the tie-tram in delivering the ties across the tie-apron. The gallows-frame is provided with a cross-beam *c* at the upper front end, over which the guys or hog-chains 28 pass. The frame-pieces *h* may be attached to the machine-car by means of bolts *o*, with suitable nuts. The tie-apron on which the ties are stored may be inclined forward, so that the ties will be moved by gravity to the graded surface on which track is to be laid.

The rail-boom *g* and mechanism coöperating therewith is also attached to the machine-car C. A cross-beam *f'* is attached to the boom *g*, and stiff legs *f* are attached to the cross-beam *f'* and to a cross-beam on machine-car, the legs being attached to machine-car by bolts *o*, operating in elongated bolt-holes *n* in the legs *f*, so that the boom-frame is made adjustable laterally to adapt the machine for laying track at different degrees of curvature. The rail-boom *g* is provided with a cross-arm *e* near its upper end. Hangers 22 are connected to the cross-beam *e* and to the boom *g*, and a cross-beam 23 is attached to the lower parts of the hangers 22, and rollers or antifriction-idlers *m* are journaled on the beams 23, and the cross-beam 23 is provided with suitable braces. Pulleys 24 are suspended from the cross-beam *e* directly over positions for rails on the tracks. Chains or cables *v* are attached to the crabs or windlasses *i* and extended over the pulleys 24 and downward, and hooks *s* are attached to the cables for engaging the rails for the purpose of raising the rails from the rail-run and lowering the same into position. When the rails are raised by means of the crab-cables, they may be thrown slightly forward and the rear ends pivoted downward into position, and by the time the rails are lowered they will heel themselves into position for connection between the angle-bars. The crabs *i* are journaled in frames which are bolted by bolts *w'* on the mast-frame pieces 25, and each is provided with a hand-wheel *u'*, which is provided with handholds *u* for convenience in operating. Each crab *i* is provided with a friction-brake *w*, attached thereto. This friction-brake is extended down to and connected to a foot-lever *w'*. A spring *x* is used for releasing the friction-brake. By means of the friction-brake *w* the person who is operating the crab can lower the rail as grad-

ually as may be desired. Boxes 26 and 27 are provided, so that the crabs may be journaled at different adjustments. The tie-tramway is constructed in sections, *p* indicating the beams in which are journaled the rollers 6 and the toothed wheels 5, said rollers and wheels alternating with each other. Sprocket-wheels *y* are also journaled in the beams *p* for driving the toothed wheels 5. The sections of the tramway *p* are flexibly connected together, so that the tramway will not be broken in turning curves. Sprocket-chains 1 are used to drive the wheels. Each section of the tramway is provided with handholds 2 for convenience in removing the sections from a car and placing the sections on the car. Guides (rollers) *z* are mounted on the sides of the tramway to keep the sprocket-chain in line when being driven. The beams *p* of one section are flexibly connected to the beams *p* of another section by means of connections 3 and 4, and each pair of beams *p* are braced by braces 7. The connection 3 is the inside connection and consists of an eyebolt projecting into a cylinder 9, which is attached to the inside of the end of a tramway-section, and of a strap 8, which engages the eyebolt and is bolted to the inside of the end of the adjacent tramway-section. The connection 4 consists of a piece of angle-iron 10, turned U shape and bolted to inside of outer beam *p* of the tramway, the open end extending beyond the end of outer side of the tramway-section and connecting by a drop-bolt 11, the angle-iron being slightly slotted or having an elongated bolt-hole with an iron strap 12 horizontally placed and bolted into the end of the outer side of the adjacent tramway-section. The outer sides of the ends of the tramway-sections are beveled in a manner to permit moving around curves without breaking the connections. The tramway-sections are spaced apart for the same purpose, the arrangement being adapted to permit moving around any ordinary degree of curvature without breaking the connections. The inside connection 3 provides for the greater part of the expansion and contraction, the eyebolt 8 being free for backward or forward movement inside of cylinder 9, attached to opposite tramway-section.

The tramway *p* is supported on trusses. (Shown in Figs. 12 and 12<sup>a</sup>.) An upright bar 19 is provided with a hook 15 at the upper end. This hook engages a pocket 16, which is attached to the car-sill 17. The truss is provided with a curved brace 18, which has a series of holes, so that the brace may be attached to the upright 19 at various adjustments, the upright 19 having a series of holes for the same purpose. The upper end of brace 18 is pivotally attached to a shaft 20, which is mounted in the upright 19, the shaft 20 having a flattened end 20', which enters a mortise in the upright 19. A roller



13 is mounted on the shaft 20 to support the inside of the tramway and provided with a flange on each end, which flanges will prevent lateral motion of the tramway either  
 5 outward or inward, and a plain roller 14 is mounted on shaft 20 to support the outer side of the tramway. Further means of adjusting the tramways is provided. A set-screw 29 engages a threaded perforation in  
 10 the upright 19 and has a swivel connection with a bearing-disk 30, which rests against the car-sill 17.

Motion is imparted to the tramway toothed wheels by means of a motor on the machine-  
 15 car. This motor is shown only in conventional form, as any suitable motor may be used for this purpose. The motor drives a shaft 31. A friction-clutch 32 is mounted on this shaft, and a series of levers 33 are provided for  
 20 throwing the parts of the friction-clutch in and out of mesh. When the tramway-wheels are to be driven, the clutch 32 is thrown in mesh in order to give motion to the shaft 34, which carries a sprocket-wheel at 35 on the  
 25 side of the machine-car. A hand-lever 36 is connected with the series of levers 33, and a sector 37 is provided for holding the lever 36 at any desired position. The lever 36 is provided with a finger-lever of usual construction and a spring-pressed dog for engaging  
 30 the sector 37. The shaft 34 drives the sprocket-wheel at 35. The sprocket-wheel at 35 drives a sprocket-chain 38, drives a sprocket-wheel at 39, which is mounted on and drives the shaft 40. Shaft 40 carries a  
 35 sprocket-wheel  $y$ , and this sprocket-wheel gives motion to the chain 1. The rollers  $m$  of the center rail-run may be given motion from the sprocket-chain 1 through the shaft  
 40 of one of the toothed wheels 5, 41 indicating one of these shafts extended far enough inside of the tramway for mounting a sprocket-wheel thereon. Sprocket-gearing 42 is provided for driving the shaft 43, which drives  
 45 the sprocket-chain 44. The shafts of rollers  $m$  are extended laterally and provided with sprocket-wheels, which are driven by the sprocket-chain 44.

The forward end of the center rail-run  $j$  is  
 50 shifted by means of a series of levers  $k$ . A hand-lever 45 is connected with the series of levers  $k$ . A sector 46 is provided for holding the lever 45 at any adjustment desired. The lever 45 is provided with the usual finger-  
 55 lever and dog for engaging the sector 46. 47 indicates the stand above the forward end of the center rail-run  $j$  on which a person stands for operating the crabs  $i$ . Antifriction-rollers 48 are provided for the forward  
 60 end of the rail-run  $j$ .

The operation of the track-laying apparatus, hereinbefore described, may be further explained as follows: The train consisting of the machine-car with its outrigging sus-  
 65 pended in front thereof, the cars carrying the

rails and provided with the dolly roller-run or center rail-run  $j$  following the machine-car, the cars carrying cross-ties following the cars loaded with steel rails, and the propelling-locomotive proceeds to the end of the  
 70 track already laid. The position of the machine-car should be such as to have the forward wheel of the machine-car about five feet to the rear of forward end of rail on which  
 75 the forward truck of the machine-car is standing. The triangular trusses are then hung in the pockets on the sides of the cars, the tramway-sections placed on the rollers on the trusses and the tramway-sections connected, as described, and the sprocket-chains  
 80 put in place and the gearing connected to the driving-gear of the motor on the machine-car. The machinery can then be set in motion by the motor on the machine-car. A  
 85 suitable number of men are employed on the cars loaded with ties and on the cars loaded with steel rails. As soon as the tramways start to running ties are placed thereon from the cars and forwarded to the tie storage and  
 90 distributing apron at extreme forward end of machine, where they are turned and held on this apron to the number required for the next rail length ahead. At the same time  
 95 in which this is being done rails are being forwarded on the center rail-run to the machine-car, from whence one rail is forwarded from the shiftable forward end of center rail-run to the rollers suspended from the outrig-  
 100 ging (shown in Fig. 3) on one side thereof and then another rail forwarded to the rollers on the other side thereof, the forward end of center rail-run having been shifted for this purpose. The rails are then in position to be  
 105 raised by the cables  $v$  with hooks  $s$ . Two men operate the crabs, and the two rails are engaged at their center so that the rails are practically evenly balanced in the hooks. In  
 110 this position the rear ends of the rails extend back about two feet beyond the forward end of rails already laid. The motor on the machine-car is stopped as soon as the rails and  
 115 the required number of ties have reached their positions. The rear ends of the suspended rails are pressed downward and thrust forward slightly in position to slide into angle-  
 120 bars already loosely fitted to forward ends of last rails laid. If the rails are then lowered, they will heel themselves into the angle-bars by force of gravity. Both rails are then securely bolted with angle-bar connection to  
 125 rails previously laid and are adjusted to gage by means of bridles or by means of spiking joints and centers. The process of gaging the track being completed, the forward end of the tie-apron is lowered. Two men are sta-  
 130 tioned at forward end of tie-apron. The train is moved forward by the propelling-locomotive while the two men permit the ties to fall onto graded surface, spacing the same into position for another rail length of track.



The train is stopped in time, so that the forward truck of the machine-car is about five feet from the forward ends of the rails just laid. The process is then repeated.

5 It will be understood that various changes may be made in the construction and arrangement of the various parts of this track-laying apparatus without departing from our invention.

10 Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A track-laying machine comprising a machine-car provided with an operating-motor, 15 outriggering mechanism carried in front of said machine-car, mechanism carried by said outriggering mechanism for heeling a pair of rails into position on the track, a tie storage and distributing apron carried by said outriggering 20 mechanism in front thereof and pivotally connected to said outriggering mechanism, means for raising and lowering the forward end of said apron, and means for delivering cross-ties and steel rails to said outriggering mechanism.

2. A track-laying machine comprising a machine-car provided with an operating-motor, 25 outriggering mechanism carried by and in front of said machine-car, a tramway and a center rail-run for delivering ties and rails to said outriggering mechanism, gearing actuated by 30 said motor for driving said tramway, means carried by said outriggering mechanism for heeling rails into position, a tie storage and distributing apron pivotally connected to the forward 35 end of said outriggering mechanism, and means for raising and lowering the forward end of said apron.

3. A track-laying machine having a center rail-run, dolly-rollers forward of said rail-run 40 to receive rails therefrom, said dolly-rollers being arranged in two series, each series being adapted to receive and support a rail, the forward end of said rail-run being shiftable for delivering a rail to each series of dolly- 45 rollers, and suitable levers for shifting the forward end of said rail-run.

4. A track-laying machine having a machine-car, outriggering mechanism carried by 50 and in front of said car, a rail-boom carried in said outriggering mechanism, two series of dolly-rollers carried by said rail-boom, a center rail-run for delivering rails to said machine-car and to said dolly-rollers, and means for shifting 55 the forward end of said rail-run whereby rails may be delivered from said rail-run to either one of said series of rollers.

5. A track-laying machine having means for 60 heeling a pair of rails into position consisting of means for receiving and supporting two rails above their position to be laid, cables provided with hooks for grasping said rails at 65 their central parts, crabs and suitable pulleys for raising and lowering the rails, and friction-brakes for controlling the operation of lowering said rails.

6. A track-laying machine having a machine-car, outriggering mechanism for laying rails, a tie storage and distributing apron pivotally connected to the forward end of said 70 outriggering mechanism, means for raising and lowering the forward end of said apron, a tramway for delivering ties to the forward end of said outriggering mechanism, said tramway being curved at the forward end to deliver 75 ties across said apron, and means for operating said tramway.

7. A track-laying machine having a machine-car, outriggering mechanism carried by 80 and in front of said car, a tie storage and distributing apron pivotally connected to said outriggering mechanism, and means operable from said machine-car for raising and lowering the forward end of said apron, said apron 85 consisting of a suitable frame and having anti-friction-rollers journaled in said frame whereby ties will travel by gravity when said apron is inclined forward.

8. A track-laying machine having a machine-car provided with an operating-motor, 90 outriggering mechanism carried by and in front of said machine-car for distributing ties and heeling rails into position, a tramway carried on the side of said machine-car for delivering ties to said outriggering mechanism, a center 95 rail-run extending under said motor for delivering rails to said outriggering mechanism, and gearing for said tramway operable by said motor.

9. A track-laying machine comprising a machine-car provided with an operating-motor, 100 outriggering mechanism carried by and in front of said machine-car, a train of cars connected with said machine-car, a center rail-run extending under said motor from said train of 105 cars for delivering rails to said outriggering mechanism, a tramway in sections hung on the sides of the cars for delivering ties to said outriggering mechanism, and gearing operable by 110 said motor for driving the ties on said tramway.

10. A track-laying machine having outriggering mechanism for distributing ties, a tramway in sections for delivering ties from a train 115 of cars to said outriggering mechanism, means for hanging said tramway-sections on the sides of the cars, and connections flexible laterally uniting each tramway-section with the adjacent tramway-section.

11. In a track-laying machine provided with 120 a train of cars and outriggering mechanism carried in front of said train of cars; a tramway in sections for delivering ties from the cars to said outriggering mechanism and flexible connections for connecting each tramway-section 125 with the adjacent tramway-section consisting of flexible joints for one side of the tramway and flexible and expansible joints for the other side of the tramway.

12. A tramway in sections for delivering 130 ties in a track-laying machine having at each



junction of sections a cylinder attached to the inside of the inner part of the tramway, an eyebolt operating in said cylinder, a strap engaging said eyebolt and bolted to the inside of  
5 the inner part of the adjacent section, a U-shaped angle-iron attached to the inside of the outer part of the tramway provided with an elongated bolt-hole through the ends of said iron, and an iron strap placed in the end of  
10 the outer part of the adjacent tramway-section and engaging said U-shaped angle-iron.

13. In a track-laying machine provided with a train of cars and outrigging mechanism for distributing ties; a tramway for delivering  
15 ties from the cars to the outrigging mechanism and means for hanging the tramway on the side of the cars consisting of trusses and pockets on the sides of the cars, each truss being composed of a slotted upright having a  
20 hook on the upper end to engage one of said pockets, a curved brace adjustably attached to the lower end of said upright, a shaft having a flattened end attached to said upright near the upper end thereof and attached to the up-  
25 per end of said curved brace, a set-screw press-

ing against the side of the car for adjusting said truss, a plain antifriction-roller on the outer end of said shaft, and a flanged roller on the inner end of said shaft for preventing  
lateral motion of the tramway. 30

14. In a track-laying machine provided with a train of cars and outrigging mechanism for distributing ties; a tramway for delivering  
ties from the cars to said outrigging mechanism, tracks for said tramway mounted on the  
35 side of the cars, and flanged rollers in said tracks for preventing lateral motion of said tramway.

In testimony whereof I have set my hand, in the presence of two witnesses, August 9, 1905. 40  
FRANK W. McCABE.

Witnesses:

A. L. JACKSON,  
J. W. STITT.

In testimony whereof I have set my hand, in the presence of two witnesses, July 27, 1905.  
VERNON E. STEEN.

Witnesses:

A. L. JACKSON,  
J. W. STITT.