No. 719,217. PATENTED JAN. 27, 1903.

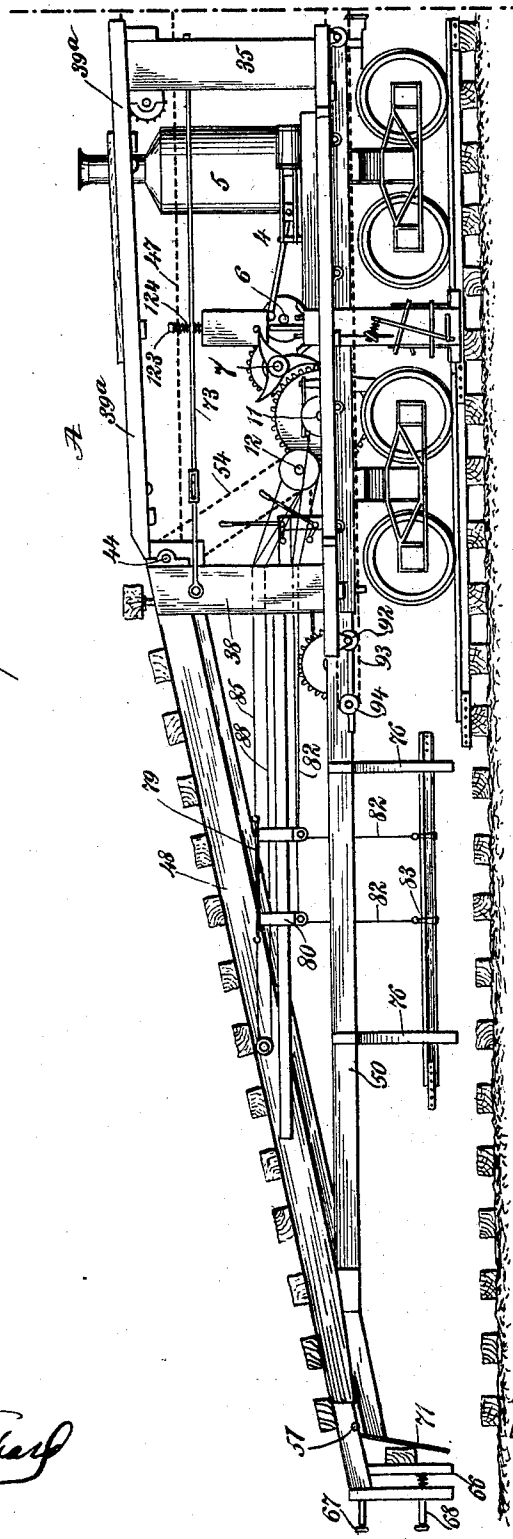
F. B. HEWITT.

TRACK LAYING AND SPIKE DRIVING MACHINE.

APPLICATION FILED DEC. 2, 1901.

NO MODEL. 10 SHEETS—SHEET 1.

FIG 1



WITNESSES:

H. Walker

H. J. Burkhard

INVENTOR

Franklin B. Hewitt

BY

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 719,217. PATENTED JAN. 27, 1903.

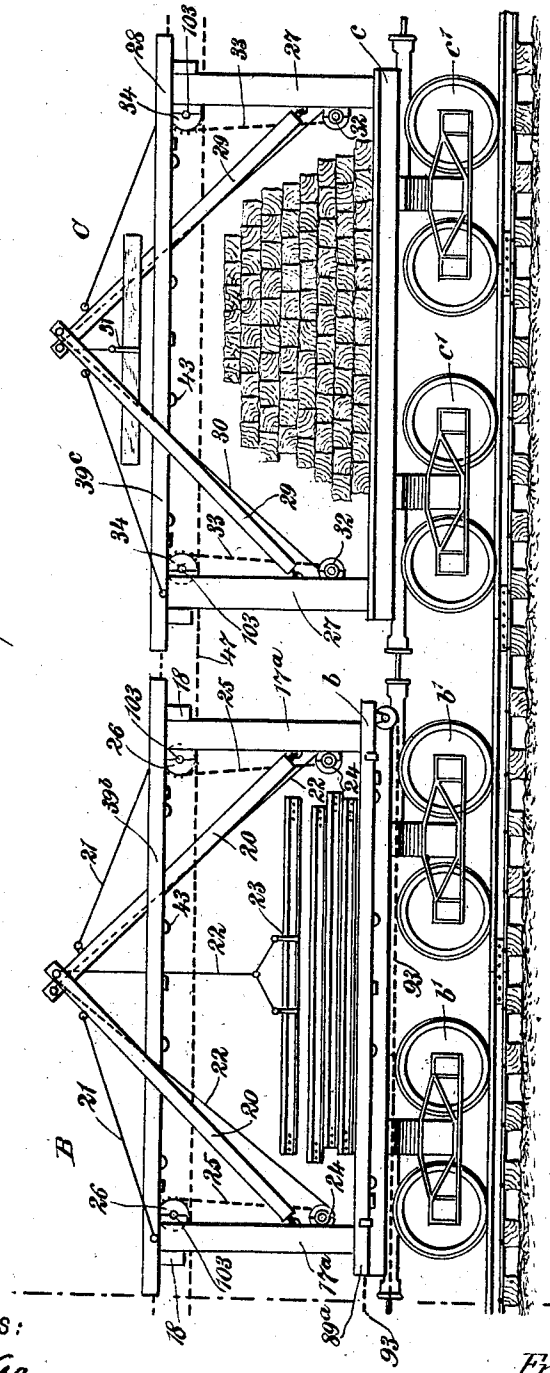
F. B. HEWITT.

TRACK LAYING AND SPIKE DRIVING MACHINE.

APPLICATION FILED DEC. 2, 1901.

NO MODEL. 10 SHEETS—SHEET 2.

Fig 2



WITNESSES:

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No. 719,217. PATENTED JAN. 27, 1903.

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TRACK LAYING AND SPIKE DRIVING MACHINE.

APPLICATION FILED DEC. 2, 1901.

NO MODEL. 10 SHEETS—SHEET 3.

Fig 3

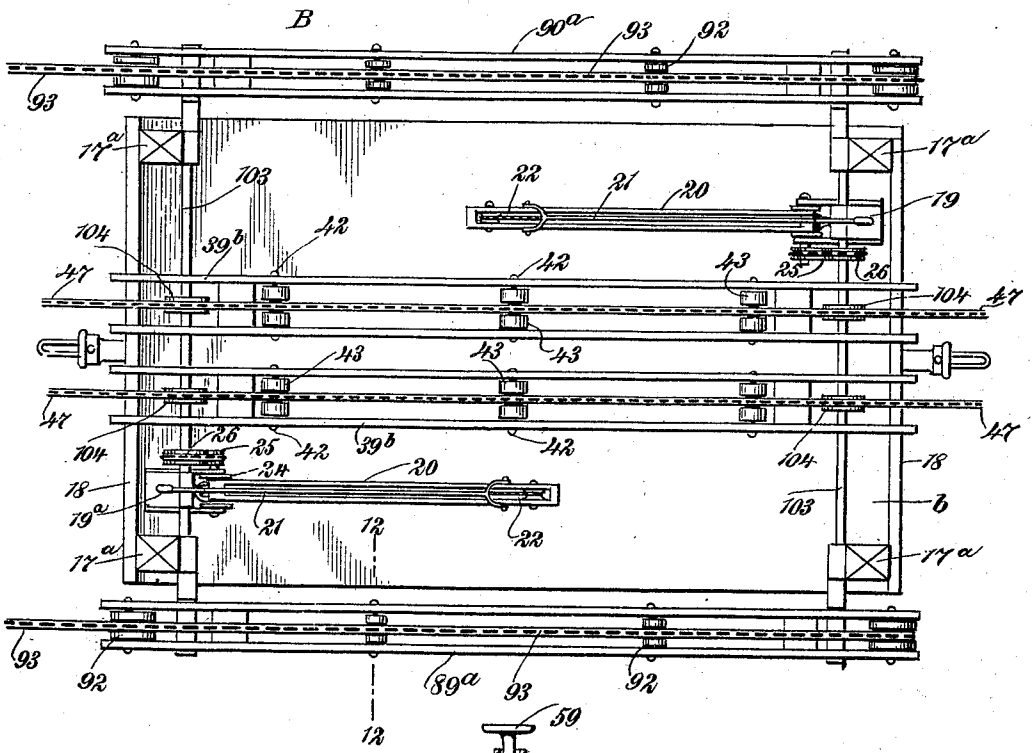


Fig 11

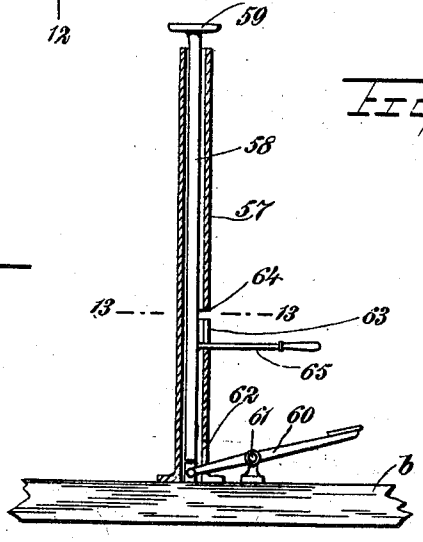


Fig 12

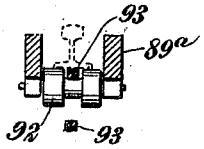
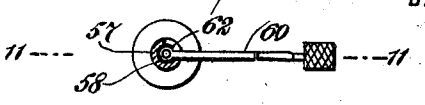


Fig 13



WITNESSES:

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No. 719,217. PATENTED JAN. 27, 1903.

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TRACK LAYING AND SPIKE DRIVING MACHINE.

APPLICATION FILED DEC. 2, 1901.

NO MODEL. 10 SHEETS—SHEET 4.

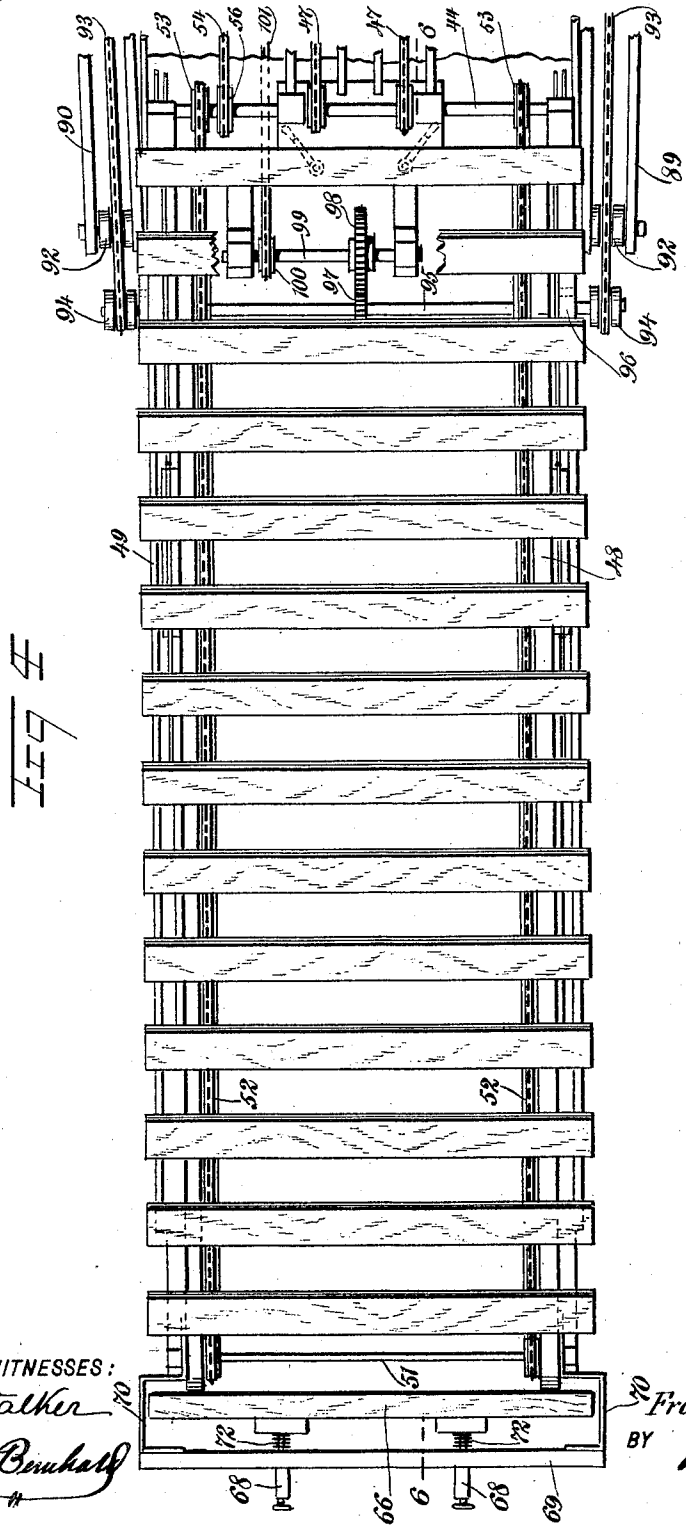


FIG 4

WITNESSES:

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No. 719,217. PATENTED JAN. 27, 1903.

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TRACK LAYING AND SPIKE DRIVING MACHINE.

APPLICATION FILED DEC. 2, 1901.

NO MODEL. 10 SHEETS—SHEET 5.

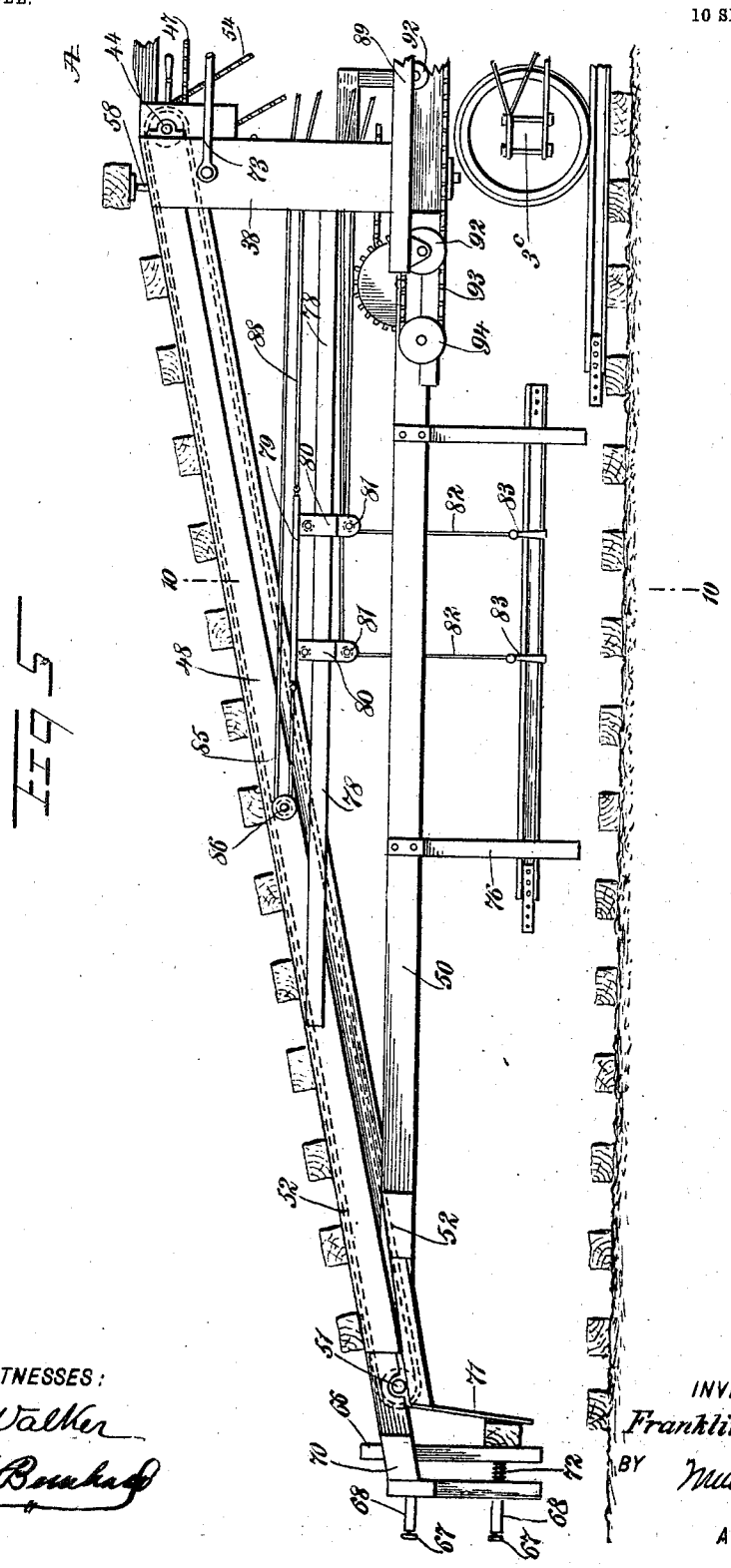


FIG 5

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TRACK LAYING AND SPIKE DRIVING MACHINE.

APPLICATION FILED DEC. 2, 1901.

NO MODEL. 10 SHEETS—SHEET 6.

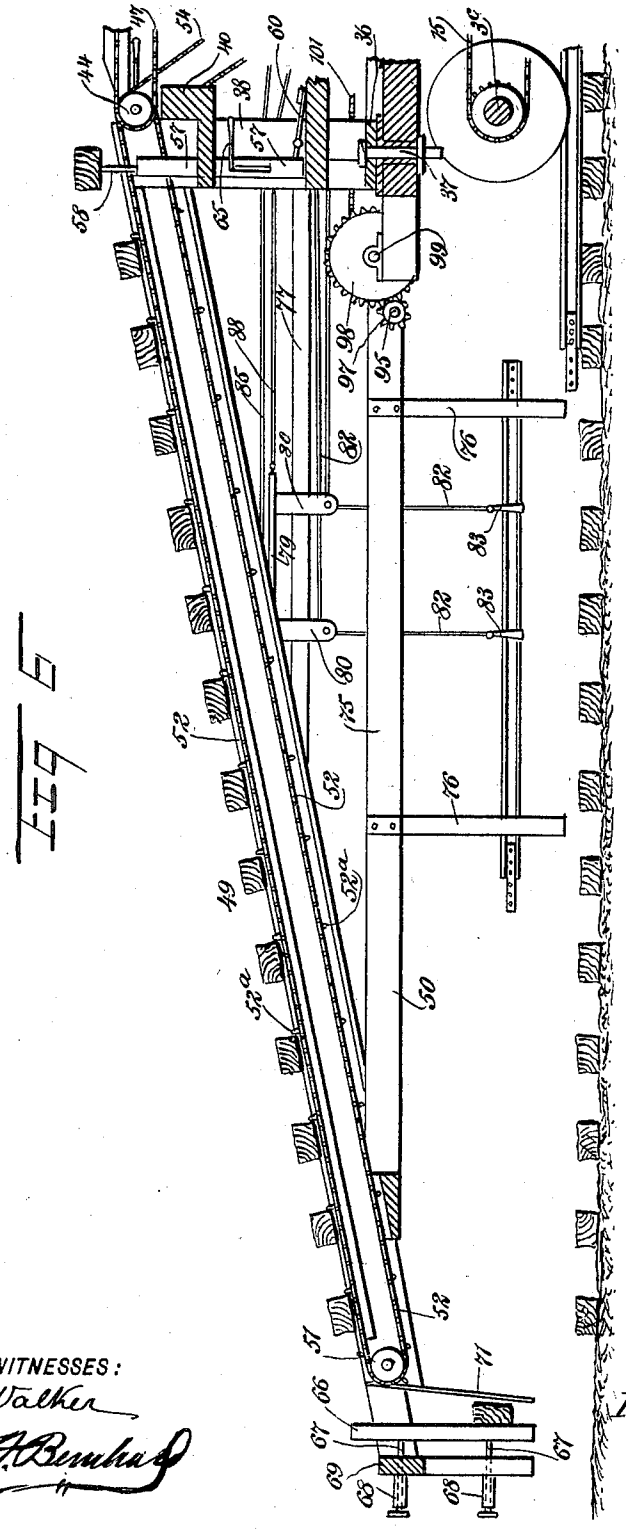


FIG 6.

WITNESSES:

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No. 719,217. PATENTED JAN. 27, 1903.

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TRACK LAYING AND SPIKE DRIVING MACHINE.

APPLICATION FILED DEC. 2, 1901.

NO MODEL. 10 SHEETS—SHEET 7.

Fig 7

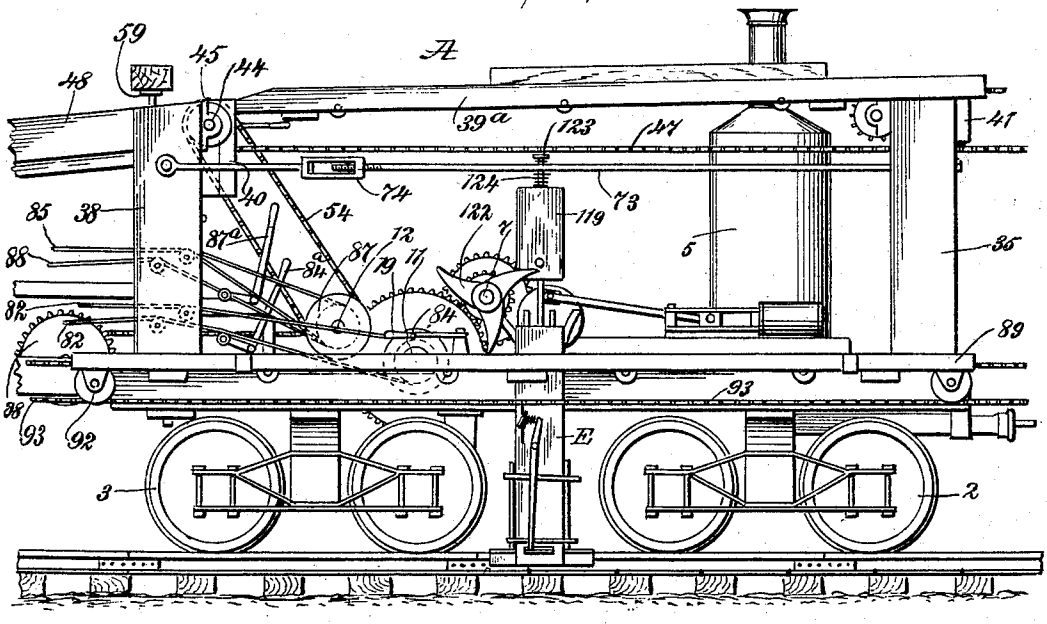
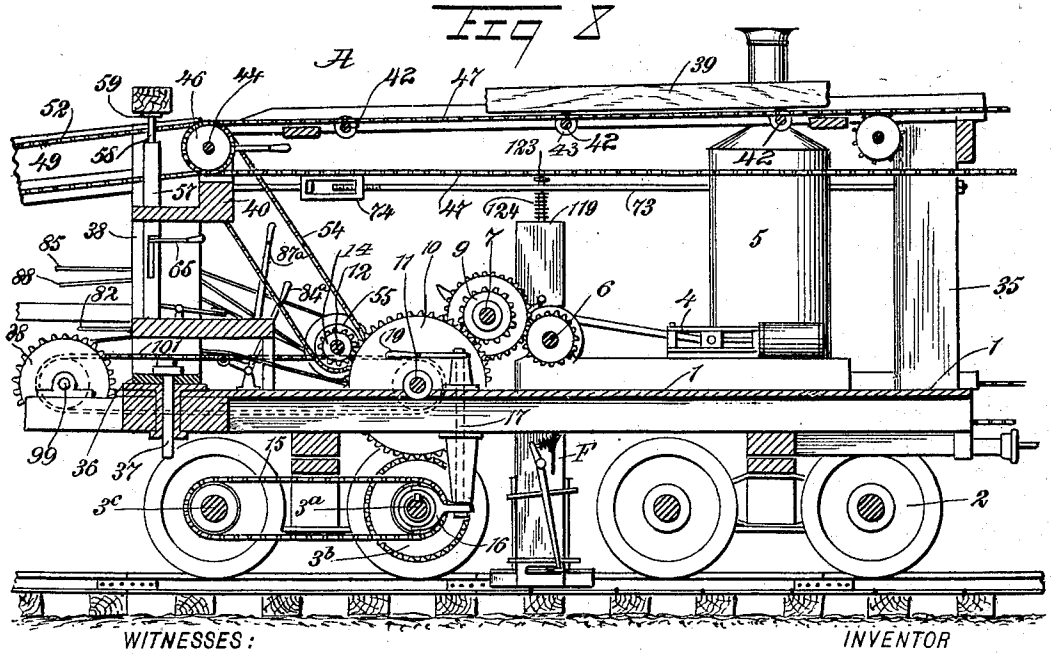


Fig 8



WITNESSES:

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No. 719,217. PATENTED JAN. 27, 1903.

F. B. HEWITT.

TRACK LAYING AND SPIKE DRIVING MACHINE.

APPLICATION FILED DEC. 2, 1901.

NO MODEL. 10 SHEETS—SHEET 8.

Fig 9

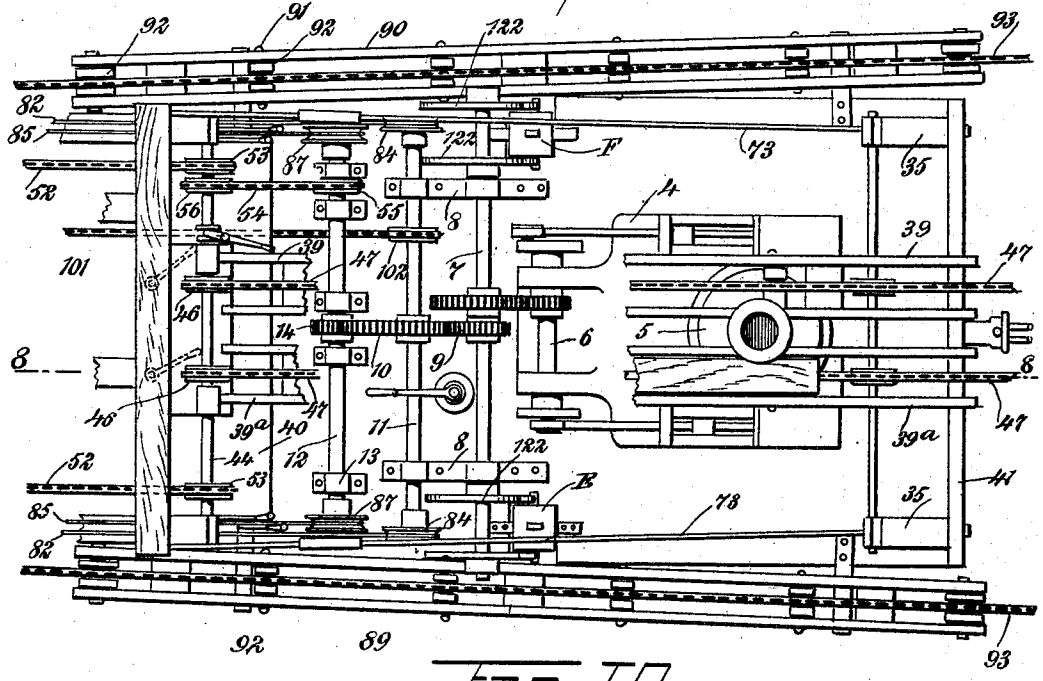
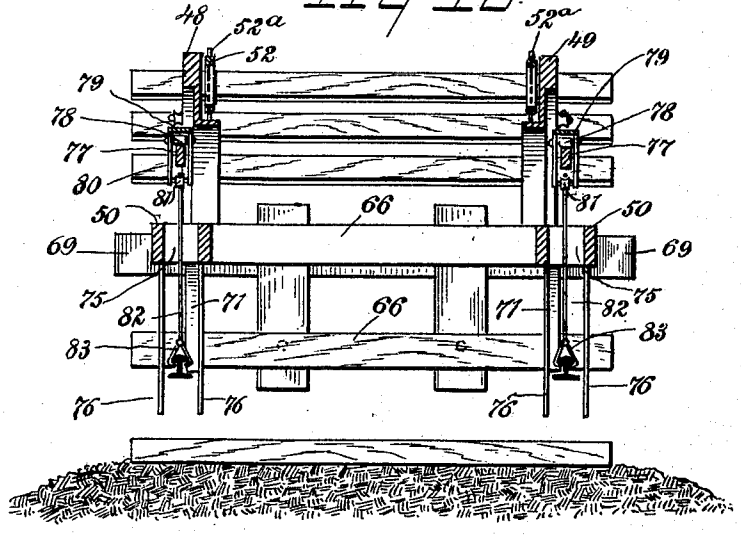


Fig 10



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No. 719,217. PATENTED JAN. 27, 1903.

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TRACK LAYING AND SPIKE DRIVING MACHINE.

APPLICATION FILED DEC. 2, 1901.

NO MODEL. 10 SHEETS—SHEET 9.

Fig 14

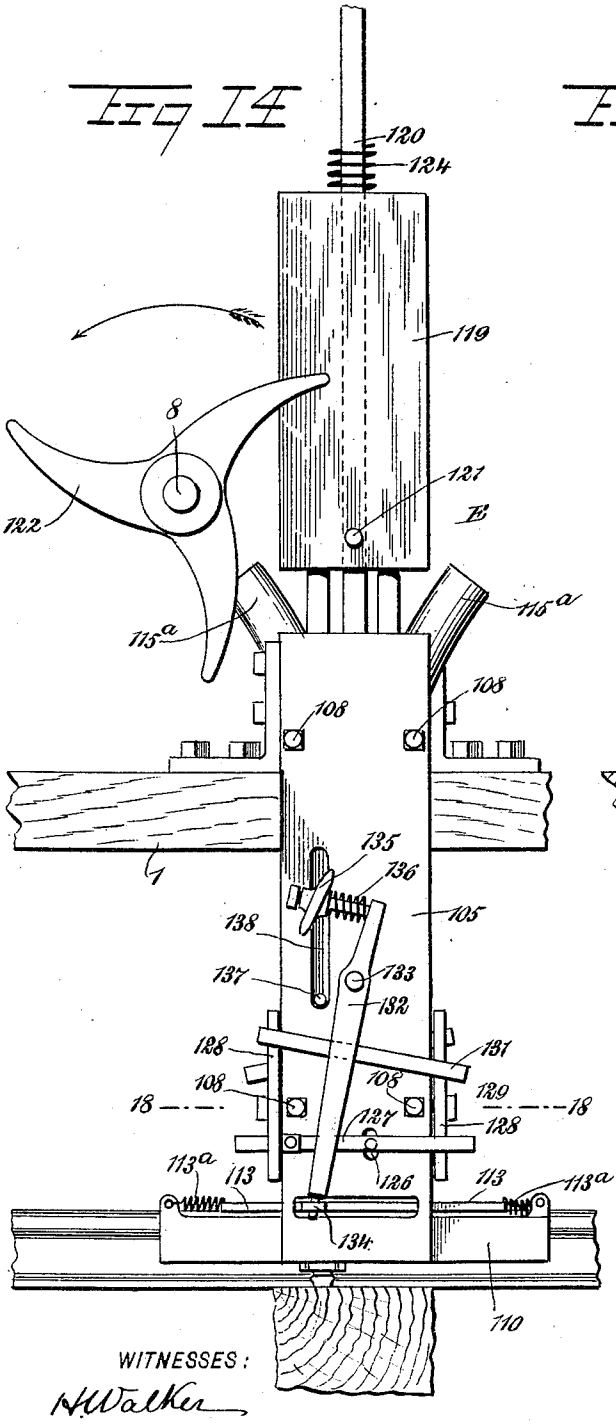
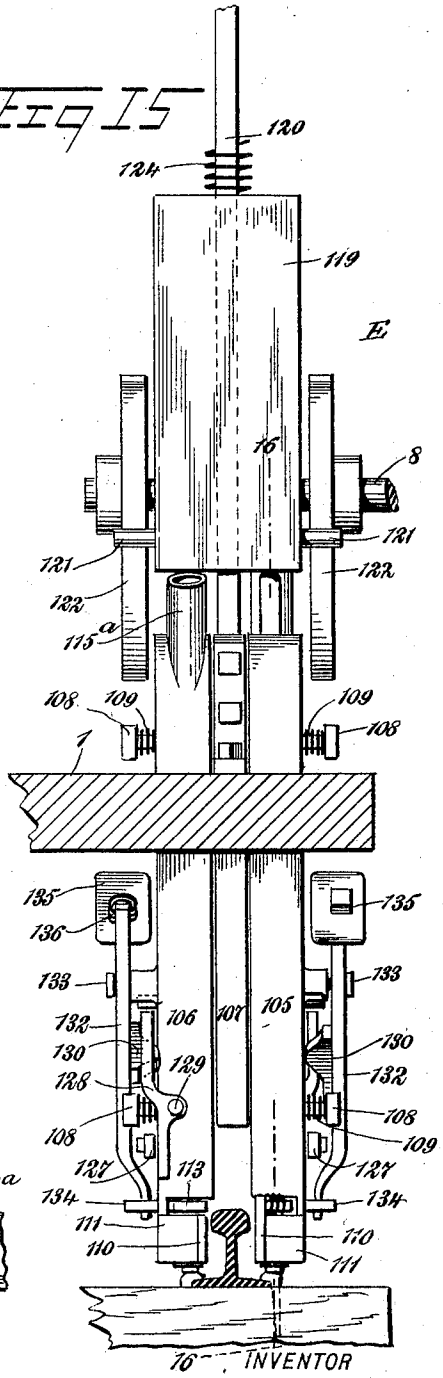


Fig 15



WITNESSES:

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No. 719,217. PATENTED JAN. 27, 1903.

F. B. HEWITT.

TRACK LAYING AND SPIKE DRIVING MACHINE.

APPLICATION FILED DEC. 2, 1901.

NO MODEL. 10 SHEETS—SHEET 10.

Fig 16

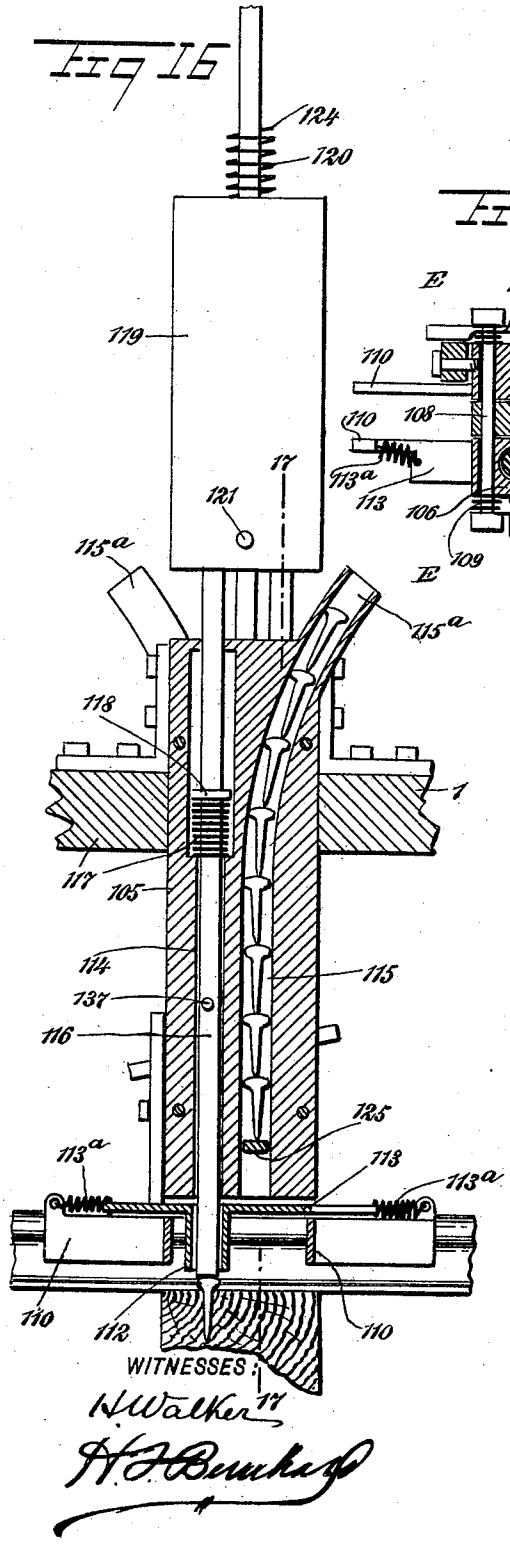


Fig 18

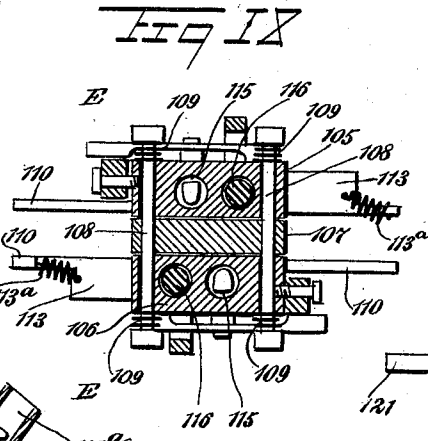
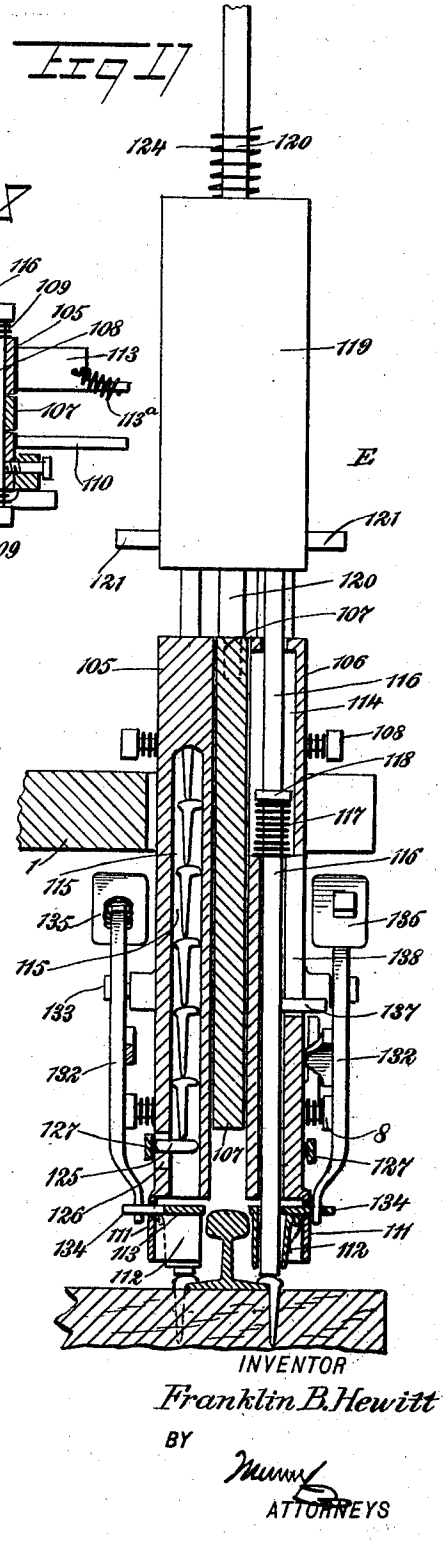


Fig 17



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANKLIN B. HEWITT, OF FORT MYERS, FLORIDA.

TRACK-LAYING AND SPIKE-DRIVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 719,217, dated January 27, 1903.

Application filed December 2, 1901. Serial No. 84,361. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN B. HEWITT, a citizen of the United States, and a resident of Fort Myers, in the county of Lee and State of Florida, have invented new and useful Improvements in Track-Laying and Spike-Driving Machines, of which the following is a full, clear, and exact description.

My invention relates to machines for laying the ties and rails of a railway-track and for driving spikes to fasten the rails in place, by which the various operations connected with laying a track may be carried out continuously by automatic mechanism.

One part of the invention has relation to mechanism by which ties may be transported from a tie-car of a construction-train and automatically laid in position on a road-bed at proper intervals and one after the other.

Another part of the invention resides in rail transporting and laying devices intended and arranged to carry lengths of rails from the construction-train and to place the rails in position on the ties, such rail-laying devices being partly under manual control in order to better position and aline the lengths of the rails.

Another part of the invention relates to the spike-driving mechanisms, one of which is arranged to drive spikes into the ties on opposite sides of each rail length immediately following the operation of placing the rail length in position on the ties. Each spike-driving mechanism includes shoes adapted to closely embrace a rail and capable of a limited lateral displacement relative thereto in order to clear and pass the fish-plates. Such mechanism also includes automatically-actuated driving-plungers and magazine feed devices controllable by the movement of said plungers and adapted to place the spikes in proper positions below the plungers to be driven thereby into the ties and for the heads of the spikes to engage the foot-flanges of the rail lengths.

With these ends in view the invention consists in the novel combinations of mechanisms and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

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

Figure 1 is a side elevation illustrating the motor-car and a part of the tie-laying and rail-laying mechanisms embodied in the construction of my apparatus. Fig. 2 is a side elevation of the rail-car and the tie-car adapted, in connection with the motor-car, to form the construction-train of the apparatus. Fig. 3 is a plan view, on an enlarged scale, of the rail-car. Fig. 4 is an enlarged plan view of a part of the motor-car and the inclined forward section of the tie-conveying mechanism. Fig. 5 is a side elevation of the parts shown by Fig. 4. Fig. 6 is a vertical longitudinal section through the parts shown by Figs. 4 and 5. Fig. 7 is a side elevation, on an enlarged scale, of the motor-car which forms a part of the construction-train. Fig. 8 is a vertical section through a motor-car in the plane of the dotted line 8 8 of Fig. 9. Fig. 9 is a plan view of the motor-car with certain parts broken away and omitted. Fig. 10 is a vertical transverse section through the inclined forward tie-conveyer, the plane of the section being indicated by the dotted line 10 10 of Fig. 5. Fig. 11 is a sectional detail view, on an enlarged scale, on the line 11 11 of Fig. 13, of the means for adjusting the ties as they are carried to the forward inclined section of the tie-conveyer mechanism. Fig. 12 is a detail cross-section through one of the rail-conveyers on the line 12 12 of Fig. 3. Fig. 13 is a sectional plan view of the tie-adjuster, the plane of the section being indicated by the dotted line 13 13 of Fig. 11. Fig. 14 is an enlarged view of one of the spike-driving mechanisms looking at one side thereof. Fig. 15 is another side elevation looking in a direction at right angles to Fig. 14. Fig. 16 is a vertical section through the spike-driving mechanism in the plane indicated by the dotted line 16 16 of Fig. 15. Fig. 17 is another vertical section in the plane of the dotted line 17 17 of Fig. 16, and Fig. 18 is a sectional plan view taken in the plane of the dotted line 18 18 of Fig. 14.

According to my invention I employ a construction-train which consists of the motor-car A, the rail-car B, and the tie-car C, all of which are coupled together by any suitable appliances. Said motor-car consists of a plat-

form 1, which is mounted on wheeled trucks 2 and 3, and this car is equipped with any suitable form of motor mechanism—such, for example, as the steam-engine 4 and the boiler 5. The energy developed by the motor drives the engine-shaft 6, the same being geared to a horizontal shaft 7, which extends across the platform and is mounted in suitable pillow-blocks or posts 8. This shaft 7 is equipped with the means for the actuation of the spike-driving mechanisms, and for the purpose of conveniently indicating said shaft I will hereinafter refer to the same as a "driver-actuating shaft." Said shaft 7 is furthermore equipped with a gear-pinion 9, having intermeshing engagement with the gear-wheel 10 on the shaft 11, that is journaled in bearings on the standards or pillow-blocks 8, and this shaft 11 is in turn intergeared with another horizontal shaft 12, which is journaled in bearings 13 on the platform, the gear-wheel 10 meshing directly with a gear-pinion 14 on the shaft 12. The utility of the shafts 11 and 12 will hereinafter appear. By reference to Figs. 7 and 8 of the drawings it will be seen that a large gear-wheel 10 of the shaft 11 has intermeshing engagement with a gear-wheel 3^b, which is provided on the rear axle 3^a of the truck 3 at the front end of the motor-car, thus positively driving the axle 3^a, and this axle is connected with the other axle 3^c by an intermediate sprocket-chain or belt 15, that engages with suitable sprocket-wheels provided on the front and rear axles. Any suitable means may be adopted for throwing the front truck 3 out of gear with the shaft 11, but, as shown by Fig. 8, the gear-wheel 3^b is controlled by a clutch-shipper 16, made fast to the lower end of a shipper-rod 17, (indicated by dotted lines in said Fig. 8,) the upper end of said shipper-rod having a suitable handle or lever 19. From this description it is clear that the motor-car may be driven from the engine 4, and this car may haul the rail and tie cars of the construction-train on the newly-laid section of the track, as represented by the several figures of the drawings.

The second or rail car B consists of a platform *b*, sustained by the trucks *b'*. This car is equipped with an elevated frame, which is formed by a series of posts 17^a and the horizontal rails 18. This rail-car is furthermore equipped with the derrick-posts 19^a, which are shown by Fig. 3 as located at nearly diagonally opposite corners of the platform B, and on these derrick-posts are hingedly mounted the adjustable booms 20, which are held in place by the stays 21. These booms are equipped with the haulage-cables 22, having the grapples 23 and adapted to be coiled on the drums 24, that are mounted on the derrick-posts, said drums being adapted to be driven by the sprocket-chains 25, which are propelled from the overhead sprocket-wheels 26, the same being driven by suitable shafts associated with the horizontal tie-conveyer, that extends horizontally above the motor-car, the rail-car, and the tie-car of the construction-train.

The other car C of the construction-train is similar in construction to the rail-car B in that it has a platform *c* on the wheeled trucks *c'*. Said tie-car has the posts 27 and the horizontal rails 28, adapted to form the upright frame, and it is equipped with the booms 29, having the cables 30, each equipped with the grapple 31. Said cable 30 is wound on a drum 32, driven by a sprocket-chain 33 from the elevated sprocket-wheel 34 of the horizontal tie-conveyer. (See Fig. 2.)

The hoisting mechanisms, which are carried by the rail-car and the tie-car, are adapted to load the rails and ties on said cars, and the hoisting mechanism of the second car may also be used for the purpose of unloading the rails onto and upon certain rail-conveyers, while the hoisting mechanism of the tie-car C is available for service in loading and unloading the ties from the car upon an endless tie-conveyer, that extends the length of the construction-train.

The motor-car A is furnished at its rear end with stationary posts 35, and at the front end of the motor-car a shiftable bed-plate 36 is arranged to rest upon the platform 1, said shiftable bed-plate being pivotally attached to the car-platform by a king-bolt 37. (See Fig. 8.) On the shiftable bed-plate are erected the side posts 38, which are located at the other corners of the motor-car and at the front end thereof, said side posts 38 being shiftable with the pivoted bed-plate 36. The posts 35 38 of the motor-car support the horizontal guideways or troughs 39 or 39^a, which are arranged in elevated positions above the working mechanisms provided on the motor-car and which are suitably sustained by certain cross-rails 40 41, supported by the front and rear pairs of posts 38 and 35, respectively. Said guideways or troughs 39 or 39^a on the upper part of the motor-car are disposed parallel with each other over the middle part of said car, and these guideways are continuous with other guideways 39^b, which are provided on the rail-car, and guideways 39^c, which are mounted on the tie-car C. The guideways on the series of cars of the construction-train are supported in elevated position by the framework thereon, and these guideways support the series of shafts 42, (see Figs. 3 and 8,) which are spaced at proper intervals apart in the guideways and are equipped with the rollers 43.

44 designates a horizontal conveyer-shaft, which is journaled in suitable bearings 45, secured to the front pair of posts 38 or to the cross-rail 40 thereon, and this conveyer driving-shaft is provided with suitable sprocket-wheels 46, with which are engaged the endless sprocket-chains 47, the same extending longitudinally throughout the length of the guideways 39 39^a 39^b 39^c. These sprocket-chains 47 travel on the shafts 42 and between the rollers 43, so as to have the upper leads

of said sprocket-chains supported by the shafts and guided by said rollers, the rear ends of the sprocket-chains being suitably supported by rollers or a shaft at the rear end of the troughs or guideways 39 on the tie-car. The sprocket-chains form endless conveyers, which extend continuously from the tie-car to the motor-car, and these conveyers occupy an elevated central position, so that the ties may be conveniently loaded upon the conveyers from the tie-car and carried over the rail and motor cars to the place where the ties are handled by a suitable adjusting device previous to depositing the ties upon an inclined or second section of the tie-conveyer.

The forward inclined section of the tie-conveyer is shown more clearly by Figs. 1, 4, 5, and 6, and this forward inclined section comprises a suitable frame which is operatively connected with the posts 38 on the shiftable bed-plate 36. This frame consists of two or more inclined side rails 48 49 and the horizontal rails 50 50. The inclined rails 48 49 have their upper ends firmly united to the upper ends of the posts 38, and the rear ends of the horizontal rails 50 are secured either to the posts 38 or upon the shiftable bed-plate 36, whereby the frame for the inclined conveyer is mounted on and supported by the shiftable elements at the front end of the motor-car, thus disposing the inclined section of the conveyer on the motor-car in a manner to shift said conveyer either to the right or left for a limited distance in laying the track on curves. The inclined and horizontal rails forming the front section of the conveyer-frame are joined solidly together at their outer ends in any approved way, and said frame is equipped near its free end with an idle shaft 51, having suitable sprocket-wheels, which are engaged by the endless chains 52, said chains having their upper rear ends engaged with sprocket-wheels 53, which are provided on the conveyer-shaft 44. These sprocket-chains 52 partake of the inclination of the rails 48 49, and said chains are furthermore equipped with the projections or dogs 52^a, with which are adapted to engage the ties which may be delivered by the horizontal conveyers 47, that traverse the troughs or guideways on the car.

The conveyer-shaft 44 serves to drive the horizontal conveyers 47, which extend over the series of cars, and the inclined conveyers 52, that are supported by the forwardly-projecting frame in advance of the motor-car, and this shaft 44 is driven from one of the shafts on the motor-car, preferably the shaft 12, through the medium of an endless sprocket-chain 54, that engages with suitable sprocket-wheels 55 56, which are secured to the shafts 12 and 44, respectively. (See Figs. 8 and 9.)

It will be seen by reference to Figs. 3 and 9 that the ties, which are carried above the cars by the conveyers, are moved endwise, because the ties are loaded from the car C by the hoisting devices so as to lie lengthwise of the car. The ties are laid crosswise of the line of progress of the apparatus, and I find it necessary to change the position of the ties when they pass from the elevated conveyers 47 to the inclined conveyers 52. Any suitable means may be adopted for changing the position of the ties; but, as shown by Figs. 6, 8, 11, and 13, I employ an adjusting device adapted to be operated by hand. This adjusting device contemplates the employment of a hollow or tubular post 57, which is erected on the platform or the shiftable bed-plate of the motor-car and lies adjacent to the conveyer driving-shaft 44. Through this hollow post extends a vertical spindle 58, the same having a head 59 in its upper extremity. To the lower end of said vertical spindle is loosely connected a foot-treadle 60, which is fulcrumed at 61 and is arranged to play for a limited distance in a vertical slot 62 at the foot of the post. This post is furthermore provided with another vertical slot 63 and with a transverse or arcuate slot 64. A handle 65 is secured to the spindle, and it is adapted to project through one or the other of the slots 63 or 64, according to the position of the spindle. As the tie is carried forward by one or the other of the conveyers 47 an operator standing at the front end of the motor-car presses with the foot upon the treadle 60, and thereby raises the spindle 58 for its head 59 to engage with one of the ties. The continued downward movement of the treadle raises the spindle-head and the tie thereon to a position above the conveyer 47, and the operator now grasps the lever 65 and turns it in a horizontal direction through the arcuate slot 64, thereby giving a quarter-turn to the spindle and changing the position of the tie from a lengthwise to a crosswise one, whereby the tie may be engaged by the dog 52^a of the conveyer 52, so as to be carried in a downward and forward direction toward the delivery end of the front tie-conveyer. The lever 65 should now be reversed until it enters the slot 63, and the foot-pressure being relaxed upon the treadle the spindle 58 and the lever drop to their lowered positions, thus placing the adjusting device in condition for operation on the next tie.

66 designates a buffer-bar arranged transversely and in a horizontal position at the lower delivery end of the inclined conveyer-frame, said buffer-bar lying in the path of the ties which are discharged from the inclined conveyer. This buffer-bar is equipped with guide-pins 67, which project forwardly therefrom and play in the guide-tubes 68, which are attached to a cross-rail 69, that is supported by the brackets 70, the latter being fastened to the rails 48 49 of the conveyer-frame. The depending guides 71 are fastened to the rails 48 49, and they are in the rear of the yieldable buffer-bar 66, whereby the tie discharged from the inclined con-

veyer 52 is adapted to pass between the guides 71 and the buffer-bar, so as to be laid in the proper place upon the road-bed. The yieldable buffer-bar 66 allows ties of different thicknesses to pass between the guides 71 and said buffer-bar, and the employment of these parts serve to properly position the ties and to place them crosswise upon the road-bed. The guide-stems 67 are cushioned by suitable springs, the same being preferably in the form of coil-springs, as indicated at 72.

Any suitable means may be adopted for adjusting the shiftable bed-plate 36 and the front section of the inclined conveyer; but, as shown by the drawings, this adjustment of said parts may be attained by the employment of the extensible tension-rods 73, which are fastened to the posts 35 38 and are equipped with the turnbuckles 74.

I will now proceed to describe the rail-conveying mechanisms for transporting the rails from the rail-car B to the inclined conveyer mechanism that extends in advance of the motor-car A.

The horizontal rails 50 of the inclined tie-conveyer frame are provided with longitudinal slots 75, (see Fig. 10,) and from these rails depend the pairs of rail-guides 76, the guides of each pair being disposed on opposite sides of the slots 75. Above the slotted rails 50 are arranged and secured the track-rails 77, which extend from the posts 38 to the inclined rails 48 49, said track-rails being parallel to the slotted rails 50. On the track-rails are adapted to travel the wheels or rollers 78 of the rail-carriages 79, said carriages being capable of movement in horizontal paths above the slotted rails 50. Each carriage 79 is provided with depending brackets 80, in which are disposed the rollers 81, serving as guides to the grapple-cables 82, which support the grapples 83 and which extend from said carriage to a winding-drum 84 on the shaft 11, whereby the cables may be lengthened or shortened in order to raise or lower the grapples and the load therein. Each carriage 79 when lowered may be drawn in a forward direction on the track-rail 78 by a cable 85, which is attached to the front end of the carriage 79, leads over the guide-sheave 86, and is carried backward to a winding-drum 87, secured on the shaft 12. Suitable levers 84^a and 87^a control the cables 82 and 85, respectively; but it will be understood that any suitable means may be provided for adjusting the carriage 79 and manipulating the grapples 83. A pull-cable 88 is attached to the rear end of the carriage 79 and leads to the motor-car, so that the operator can return the rail-carriage when unloaded back to a position adjacent to the rail-conveyers.

89 90 designate the lengths of the rail-conveyer troughs, which are disposed on opposite sides of the platform on the motor-car A, and 89^a and 90^a are similar lengths of troughs or guideways disposed on opposite sides of the platform of the rail-car B, said lengths of the troughs 89^a and 90^a forming continuations of the trough lengths on the motor-car. The trough lengths 89 90 are disposed in slightly inclined and converging positions, and these lengths of the troughs are adapted to deliver the rails across the frame-rails 50, so that the grapples 83 of the rail-carriages may properly engage with the lengths of the rails to be laid. The lengths of the conveyer-troughs support the shafts 91, which are equipped with the rollers 92, said rollers being provided in the troughs on the motor and rail cars A B. These rollers sustain the endless rail-conveyers 93, which extend continuously of the troughs on the motor and rail cars, and these conveyers are engaged with sprocket-wheels 94 on a horizontal shaft 95, which is journaled in suitable bearings 96 on the motor-car, said shaft 95 being provided with a gear-pinion 97, having intermeshing engagement with another gear-pining 98 on the intermediate shaft 99, the latter one journaled in bearings on the motor-car. This shaft 99 is provided with a sprocket-wheel 100, that engages with a sprocket-chain 101, that is propelled by a sprocket-wheel 102 on the shaft 11. (See Fig. 9.) The rails may be unloaded from the car B by the hoisting mechanisms and deposited in the troughs 89^a and 90^a. From thence the rails are carried by the endless chain conveyers 93 along the troughs 89 90, which deliver said rails over the slotted frame-rails 50. The lengths of the rails to be laid are engaged by the grapples of the traveling carriages, and these carriages are moved toward the front end of the inclined conveyer-frame, said carriages traveling on the rails 78. When the carriages shall have moved far enough to bring the rail lengths over the slotted rails 50, each carriage is arrested and the cables 82 are paid out, thus lowering the grapples 83 and the rail length through the slot 75 in the rail 50 and between the depending guides 76. The length of the rail may thus be lowered into position upon the ties, and this length of rail may be manipulated or controlled so that it will occupy an alined and abutting relation to the length of rail previously laid and spiked upon the ties. If desired, the fish-plates may be attached to the end portions of the rails before the latter are lowered into the position on the ties.

The sprocket-wheels 26 34 on the rail and tie cars are adapted to drive the drums 24 32 and are attached to horizontal shafts 103, journaled in elevated position on the framework of said cars. These shafts are provided with sprocket-wheels 104, that engage with the continuous endless conveyers 47, that operate in the troughs for the tie-conveyers, whereby said shafts 103 are driven by said tie-conveyers.

The endless rail-conveyers are disposed at opposite sides of the motor and rail cars and in the horizontal plane of the platform thereof, thus making the rail-conveyers lie below

and on opposite sides of the elevated tie-conveyers.

I will now proceed to describe the spike-driving mechanisms, one of which is carried at each side of the motor-car at or about the middle thereof, said spike-driving mechanisms being indicated generically by the reference-letters E F. (See Figs. 7, 8, and 9.) These spike-driving mechanisms are identically the same in construction and operation, so that the description of one will answer equally as well for the other. This spike-driving mechanism (indicated at E) is shown more clearly by Figs. 14 to 18, inclusive, of the drawings, and said mechanism has its operating parts mounted upon a framework, the latter being attached to a platform 1 of the motor-car, so as to depend therefrom. This frame of the spike-driving mechanism is preferably constructed in sections, which are held yieldably together, said sections of the frame being indicated by the numerals 105 106 107. These sections are arranged parallel and in lateral contact, as shown, the core 107 being interposed between the duplicate sections 105 106. Any suitable means may be employed for yieldably holding the duplicate sections in contact with the core-section; but, as shown more particularly by Fig. 18, the transverse bolts 108 extend through suitable openings of the series of sections, said bolts receiving the coiled springs 109, which serve to press the members firmly together. The core-section 107 does not extend down to the lower ends of the duplicate side members, and these side members are provided with parallel shoes 110, the same arranged a considerable distance below the core-section. These shoes are disposed in opposing parallel relation in order to leave a slot or space between them for the reception of the rail, (see Figs. 15 and 17,) whereby the shoes are adapted to lie on opposite sides of the rail, and they are adapted to be carried along the rail when the machine is advanced on the track. The shoes are offset in opposite directions, as indicated at 111, and these offset portions provide spaces for the play of the depending spout 112, which is carried by the reciprocatory feed-plate 113, one of the feed-plates being interposed between the lower end of each companion member 105 or 106 and its feed-plate 113.

The members 105 and 106 of the spike-driver frame are each provided with a straight vertical plunger-way 114 and with a feed-passage 115. The plunger-way opens at its upper and lower ends through the member of the frame; but the feed-passage 115 opens at its lower end through the frame member at a point adjacent to the lower end of the plunger-way, while the upper end of the feed-passage is curved laterally and extended to form the spout 115^a. The spouts 115^a of the two feed-passages in the companion members of the frame are curved in opposite directions, so as to allow the spikes to be easily fed to the passages.

116 designates a driving-plunger, which is fitted in the plunger-way 114 of each member of the driver-frame, and this plunger is normally lifted by the coiled spring 117, that acts against the collar 118 on the plunger-rod. This plunger-rod extends above the driver-frame, and it lies in the path of a driver-weight 119, the latter being slidably fitted on a fixed guide-rod 120. The driver-weight is provided with a stud or pin 121, which is disposed in the path of the curved arms on the tappet-wheel 122, the latter being secured firmly on the driver-actuating shaft 7. The guide-rod 120 may be secured to a suitable part of the driver-frame or to any suitable place on the motor-car, and this rod is provided with a collar 123, against which bears a spring 124, the latter being seated upon the driver-weight 119 in order to quickly impart an initial downward impulse to the driver-weight each time an arm of the tappet-wheel 122 clears or passes the stud 121. The arms of the tappet-wheels 122, associated with the driver-weights for the pair of plunger-rods which operate in the companion members of the driver-frame, are arranged in corresponding positions, so that the driver-rods will be simultaneously actuated in order to drive two spikes into a tie at one time and on opposite sides of the rail.

The spikes supplied to the feed-passage 113 are prevented from dropping below a certain position by a detaining-stud 125, which projects into the passage 115 and is arranged to work in a slot 126, said detaining-stud being attached to a stop-arm 127, which is fixed to the outside of the frame member. Against this stop-arm is adapted to press the lower end of an upright lever 128, the latter being fulcrumed at 129 on a member of the driver-frame and having its upper end disposed in the path of a cam 130, which is provided at one end of an arm 131 on the feed-lever 132. Two of these feed-levers are employed for the members 105 106 for the driver-frame, said levers being fulcrumed at 133 and having their lower ends loosely connected with lugs 134, that are provided on the feed-plates 113, whereby the feed-levers are operatively connected with the feed-plates in a manner to vibrate or move the latter upon the shoes. The levers 132 are provided at their upper ends with friction-wheels 135, attached to the levers by the spring-controlled pins 136, and these friction-wheels are disposed in the path of projections 137, which are attached to the plunger-rods 116 and extend through the slots 138 in the members of the frame. Each feed-plate 113 is held by a spring 113^a in a position for the spout 112 to aline or register with the plunger-way 114; but on the elevation of the plunger by the spring 117 after the driver-weight 119 is raised by the tappet-wheel the projection 137 rides against the wheel 135 and

moves the feed-lever 132 in a direction to actuate the feed-plate 113 against the energy of its spring 113^a. The feed-plate is thus moved to a position where its spout 112 registers with a feed-passage 115, and a spike which is released by the movement of the stud 125 is free to drop through the lower part of this passage and enters said spout. The return of the feed-plate 113 to its normal position brings a new spike below the plunger, and on the descent of the drop-weight 119 this plunger forces the spike into the tie. The release of the stud 125 is effected by the cam-surface 130 of the lever-arm riding against the lever 128, which presses the spring-arm 127 in a direction to withdraw the stud, the latter being returned to its normal position as soon as the lever 128 is released.

The operation may be described briefly as follows: The machine is installed on a newly-laid section of track and is propelled slowly along the same. The several conveyers and operating mechanisms of the machine are driven by the described means, and the ties are loaded upon the conveyers 47, while the rails are loaded on the conveyers 93. The ties at the delivery end of the conveyers 47 are changed to the proper crosswise position by the adjusting device, and said ties are carried by the conveyer 52 against the buffer 66, whereby the ties are laid upon the road-bed. The rails are transported by the conveyers 93 to the rail-carriages 79, and these carriages have the grapples 83 engaged with the rails, and they are moved or manipulated to lay the lengths of rails upon the ties. The shoes of the spike-driving mechanisms engage with the rails, and the plungers of said driving mechanisms are actuated in a manner to force the spikes into the ties and so that the heads of the spikes will engage with the base-flanges of the rails that are placed into position. The plungers of the spike-drivers are actuated automatically and rapidly by the tappet-wheels on the shaft 8. The shoes of the spike-drivers are adapted to yield laterally in order to pass the fish-plates. The forward inclined tie-conveyer may be swung to the right or left by adjusting the bed-plate 36, thus laying ties along the curved section of the road-bed.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an apparatus of the class described, the combination with a car, of a tie-conveyer constructed in two lengths or sections and arranged for one length thereof to deliver its load to the other length or section, the rear length or section being arranged in an elevated overhead position on the car and adapted to carry ties in an endwise direction along said car, and the front section or length extending forwardly from said car and arranged to deposit the ties crosswise of the path of the car.

2. In an apparatus of the class described, the combination with a car, of a frame projecting forwardly and downwardly from said car, and a tie-conveyer constructed in two lengths or sections and arranged for one section to deliver ties to the other section, the rearmost section consisting of a narrow conveyer arranged to carry ties in an endwise direction and the foremost section consisting of a wide conveyer arranged to move in a downwardly-inclined path on said frame and to carry the ties in a crosswise position and to deposit said ties upon a road-bed in a position crosswise of the path of the car.

3. In an apparatus of the class described, the combination of a motor-car, a conveyer-frame shiftably supported thereon and capable of turning around a vertical axis, and a tie-conveyer supported by the shiftable conveyer-frame.

4. In an apparatus of the class described, the combination of a motor-car, a bed-plate mounted on said car to turn on a vertical axis, an inclined conveyer-frame supported by said bed-plate and shiftable therewith and projecting forwardly from the car, and a tie-conveyer supported by said conveyer-frame.

5. In an apparatus of the class described, the combination with a tie-conveyer, of a tie-guide at the delivery end of said conveyer, and a buffer adjacent to the guide and disposed in the path of the load discharged from the conveyer.

6. In an apparatus of the class described, the combination with a tie-conveyer, of a yieldable buffer at the delivery end of said conveyer.

7. In an apparatus of the class described, the combination with a tie-conveyer, of depending tie-guides at the delivery end of said conveyer, a yieldable buffer adjacent to the tie-guide and disposed in the path of the load discharged from said conveyer, and means for supporting said buffer in operative position.

8. In an apparatus of the class described, the combination of a car, a tie-laying conveyer projecting forwardly from said car, rail-laying mechanisms mounted on said car, spike-driving mechanisms also mounted on the car and arranged for operation subsequent to said laying mechanisms for the ties and the rails, and means for feeding ties and rails to the respective laying mechanism.

9. In an apparatus of the class described, the combination with a car, of a tie-conveyer having inclined and horizontal lengths, and a tie-shifter including a spindle having means for projecting the same above the path of the ties and for turning said ties from an endwise to a crosswise position.

10. In an apparatus of the class described, the combination with a car, and a tie-conveyer having horizontal and inclined lengths, of a tie-shifter including an upright spindle, a treadle for lifting said spindle, means for turning said spindle on its axis, and a suitable guide for the spindle.

11. In an apparatus of the class described, the combination of a car provided with a longitudinal carriage-track, a wheeled rail-car-

riage arranged to travel on said track in a straight path parallel to the car, rail-lowering devices mounted on said carriage, and a rail-conveyer mounted on the car in a direction inclined to the carriage-track and arranged to deliver its load in an inclined path crossing the track and in position to be loaded on said rail-carriage.

12. In an apparatus of the class described, the combination with a car, of a forwardly-inclined frame having horizontal tracks at its sides, a wide inclined tie-conveyer mounted on said frame and arranged to deliver ties in crosswise positions and in front of said tracks, rail-carriages mounted on said horizontal tracks of the frame and adapted to travel in advance of the car and in rear of the delivery end of the tie-conveyer, lowering devices mounted on said carriages, and rail-conveyers arranged to deliver their loads to said carriages.

13. In an apparatus of the class described, the combination with a car, of a forwardly-inclined frame having horizontal tracks at its sides, a wide inclined tie-conveyer supported by said frame, rail-conveyers at the sides of the car, rail-carriages mounted on said horizontal tracks, means for lowering the loads on said carriages, and suitable haulage devices for operating said carriages.

14. In an apparatus of the class described, the combination with a car, of a forwardly-inclined frame supporting a downwardly-traveling tie-conveyer, carriage-rails disposed in horizontal positions and terminating in rear of the delivery end of the tie-conveyer, rail-carriages arranged to travel on said tracks, front and rear pairs of vertical guides 76 depending from the frame and disposed on opposite sides of the vertical planes of the carriage-rails, and lowering devices mounted on said rail-carriages and arranged to lower rails between said pairs of guides.

15. In an apparatus of the class described, the combination with a car, of a forwardly-inclined frame having the horizontal slotted bars 50, the pairs of vertical rail-guides secured to said bars and disposed on opposite sides of the slots therein, rail-carriages having means for lowering rails through the slotted bars and between the guides, and a tie-conveyer on said frame.

16. In an apparatus of the class described, the combination with a motor-car, and a trailing car, of rail-conveyers disposed on opposite sides of said cars and having forwardly-converging lengths, means on the motor-car for propelling said conveyers, and lowering devices mounted on the motor-car and adapted to receive the load from said conveyers.

17. In an apparatus of the class described, the combination with a car, of a shiftable frame mounted on and projecting forwardly from said car, said frame supporting a tie-laying mechanism and a rail-laying mechanism, both of said mechanisms being shiftable with the frame.

18. In an apparatus of the class described, the combination with a motor-car, of a trailing car having a conveyer, hoisting devices mounted on said trailing car and adapted to transfer the load therefrom to said conveyer, and means for discharging the conveyer-load in advance of the motor-car.

19. In an apparatus of the class described, the combination with means for laying ties, and means for laying rails, of automatic spike-driving mechanisms disposed in rear of said laying mechanisms.

20. In an apparatus of the class described, the combination with a motor-car, of a tie-laying mechanism driven therefrom, a rail-laying mechanism on said motor-car and arranged to discharge its load subsequent to the tie-laying mechanism, and a subsequent effective spike-driving mechanism also mounted on and driven from said motor-car and adapted to drive the spikes into the ties and in engagement with the rails.

21. In an apparatus of the class described, a spike-driving mechanism having shoes arranged to engage with opposite sides of a rail, and means for permitting said shoes to yield laterally, combined with driving devices, and suitable feed devices.

22. In an apparatus of the class described, a spike-driving mechanism comprising a frame having yieldable members adapted to clear obstructions in its path, a driving element, and means for actuating the driving element.

23. In an apparatus of the class described, a spike-driving mechanism including a sectional frame having means for yieldably holding the members in operative relation, drivers fitted in certain of said members, and spike-feeding devices controllable automatically from the drivers.

24. In an apparatus of the class described, a spike-driving mechanism comprising a suitable frame having a plunger-way, a plunger, a driving-weight operatively related to the plunger, and a tappet-wheel for actuating the driving-weight.

25. In an apparatus of the class described, a spike-driving mechanism comprising a suitable frame having a feed-channel, a detaining element normally held across the path of said feed-channel, a reciprocatory feed-plate, a plunger, and devices actuated by the plunger for moving said detaining element and the feed-plate.

26. In an apparatus of the class described, a spike-driving mechanism comprising a suitable frame, a plunger, a reciprocatory feed-plate having a spike-guide, a feed-lever connected with said plate, and means between the plunger and said lever for actuating the latter.

27. In an apparatus of the class described, a spike-driving mechanism comprising a suitable frame, a plunger, a detaining element normally projecting across the feed-channel in said frame, a feed-lever actuated by the

plunger and having a cam-shaped arm, and a lever between the detaining element and said arm.

28. In an apparatus of the class described, a spike-driving mechanism comprising a frame divided longitudinally into members which are held yieldably together, shoes on two of said members and disposed in spaced relation, suitable plungers on the shoe-carrying members of the frame, and feed devices in operative relation to the shoes and controllable by said plungers.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANKLIN B. HEWITT.

Witnesses:
H. T. BERNHARD,
EVERARD B. MARSHALL.