

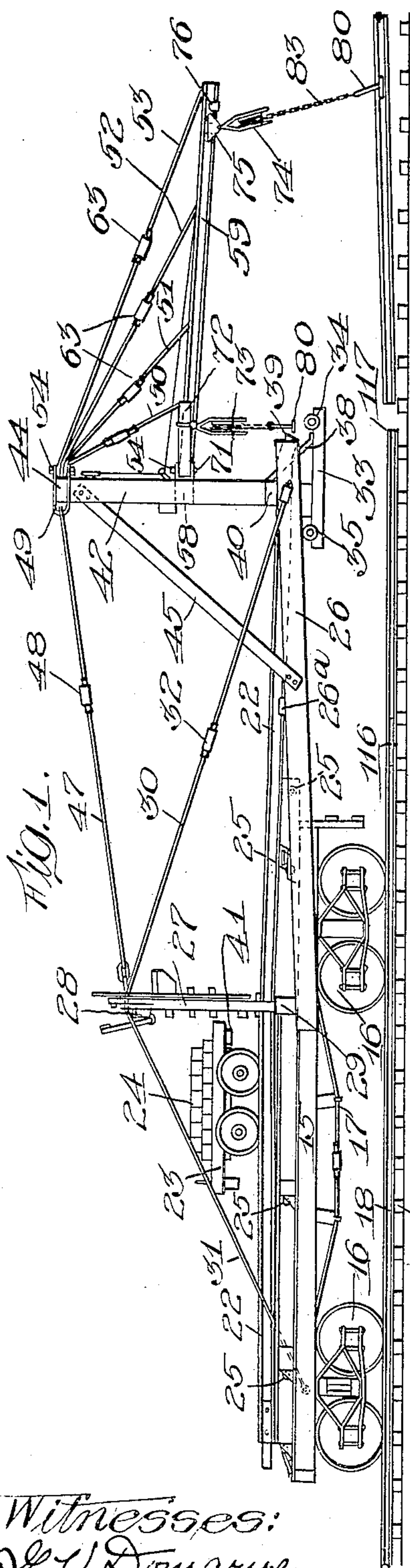
No. 832,058.

PATENTED OCT. 2, 1906.

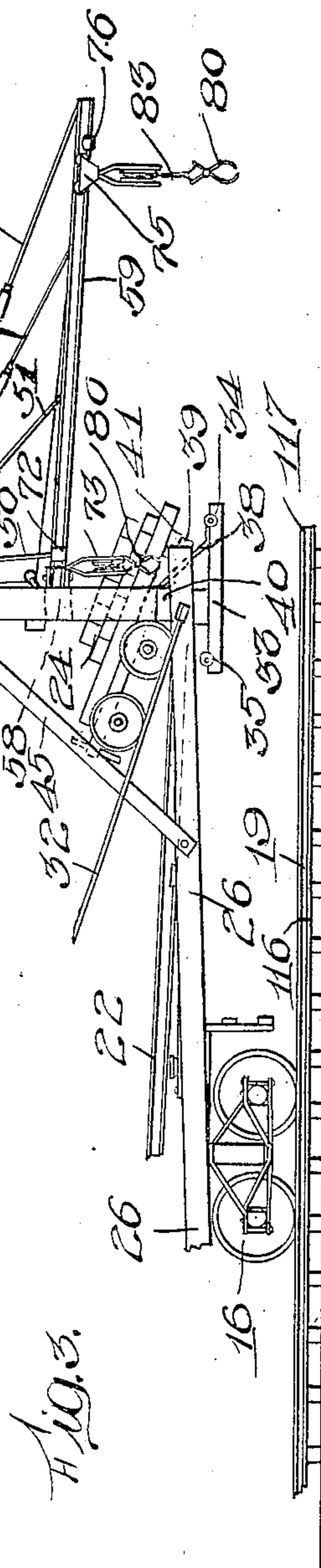
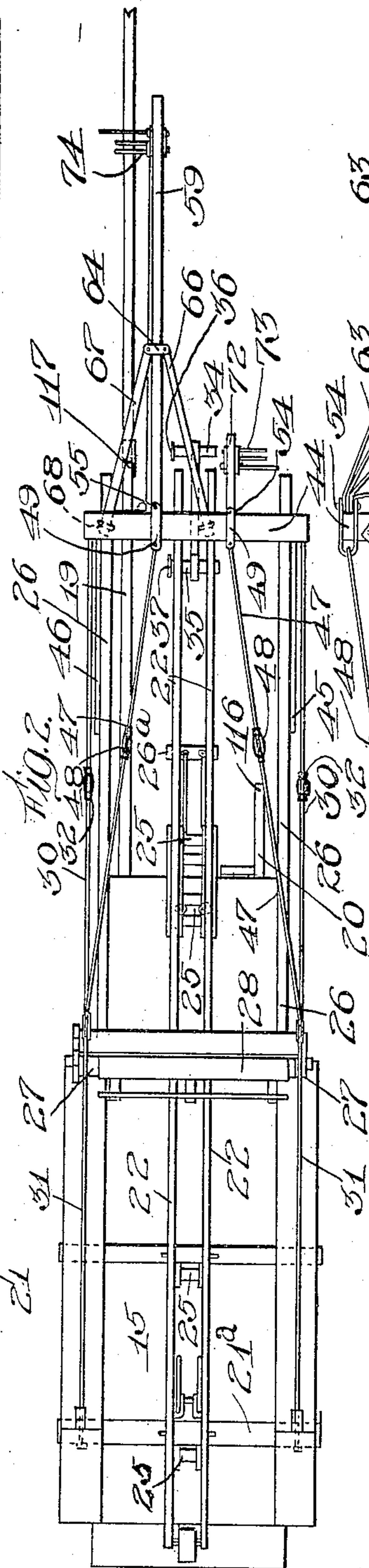
G. F. H. HICKS.
RAILROAD TRACK LAYING APPARATUS.

APPLICATION FILED APR. 4, 1906.

3 SHEETS—SHEET 1.



Witnesses:
E. V. Domaruk.
A. C. Bird.



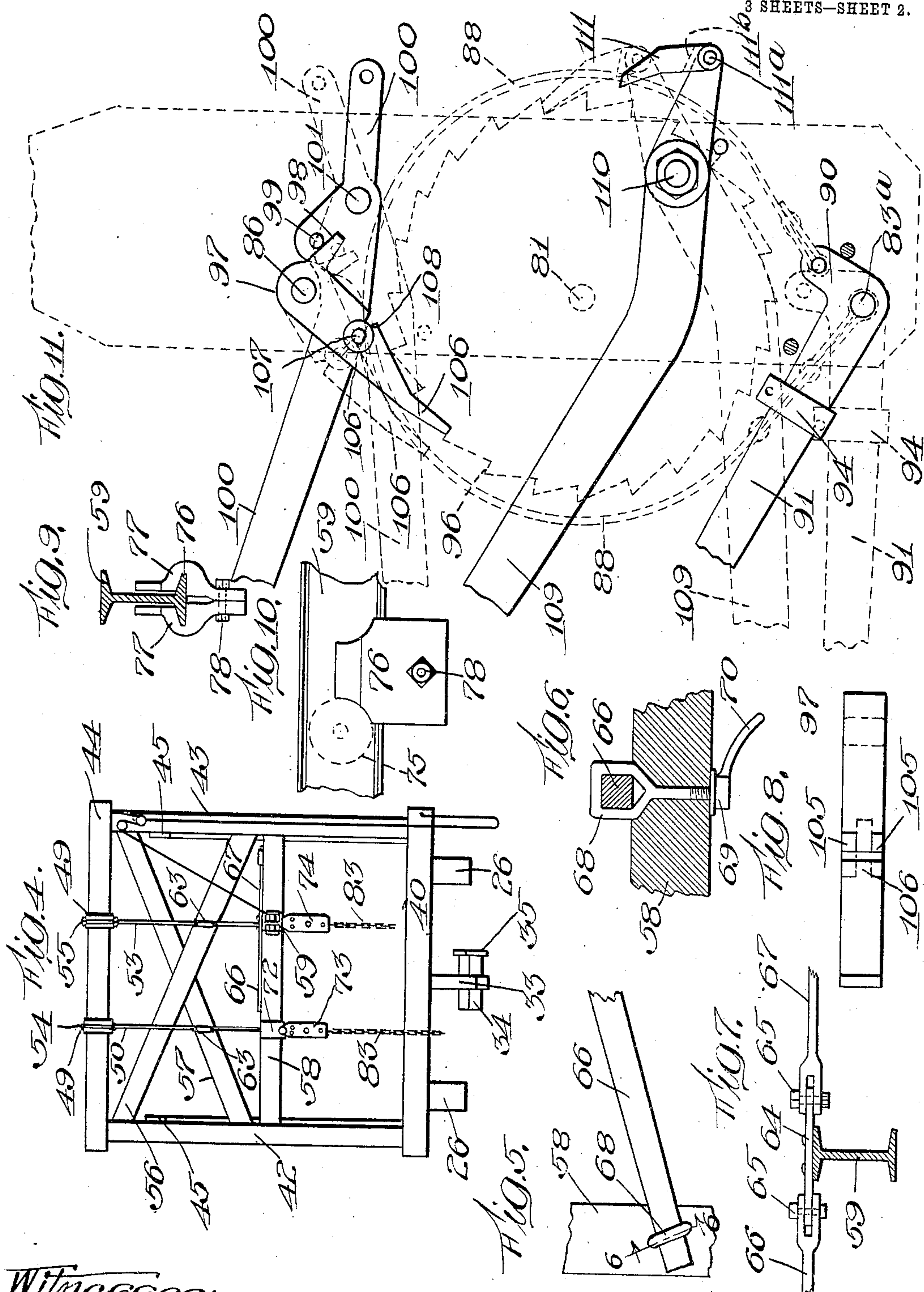
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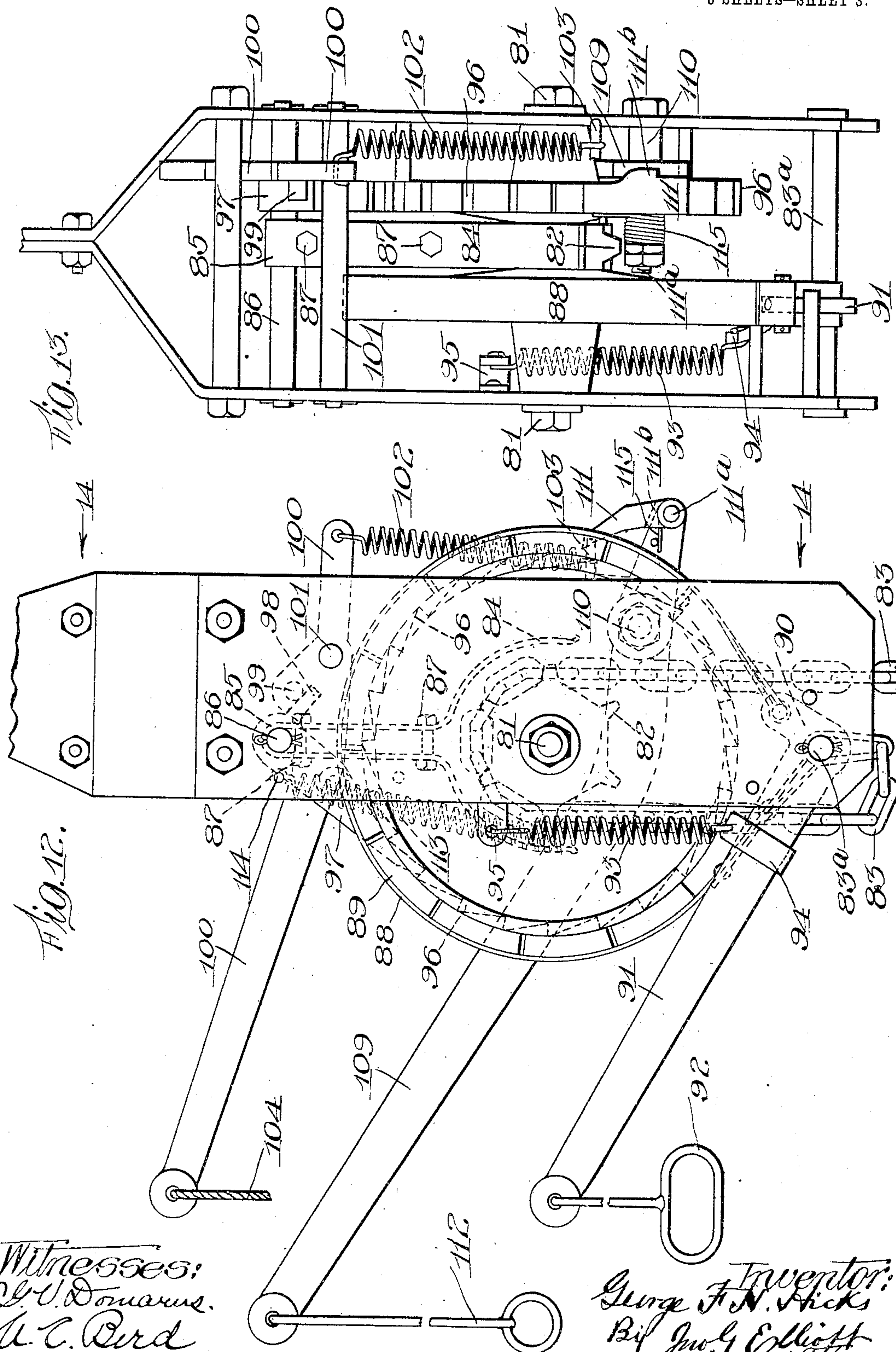
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

GEORGE F. H. HICKS, OF CHICAGO, ILLINOIS.

RAILROAD-TRACK-LAYING APPARATUS.

No. 832,058.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed April 4, 1906. Serial No. 309,755.

To all whom it may concern:

Be it known that I, GEORGE F. H. HICKS, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Railroad-Track-Laying Apparatus, of which the following is a full, clear, and exact specification.

This invention relates to improvements in railroad-track-laying apparatus in which a pioneer car is coupled to a number of flat-cars, on some of which are stored rails and on others ties for track-laying purposes, along the center width of which cars is laid a continuous track, along which cars loaded with ties are conducted, and from which the ties are discharged off the forward end of the pioneer car, there being rollers between the rails of said track over which the rails are conducted to the forward end of the pioneer car, whence they are lowered to the ties previously placed in their operative position on the road-bed.

Previous to my invention it has been necessary to put all of the ties in place on the road-bed before the rails were run forward off the pioneer car to a point over the newly-laid ties, and then in order to use as small a number of men as possible but a single rail was run out onto a double roller and thence onto a movable dolly when breaking joints to carry it forward for the long side, when it was then heeled into place, the same men then running forward the rail for the opposite side of the track and heeling it into place, this heeling of the rail into place requiring the rail to be tracked on the ties or else wholly or partially lifting it against the end of the laid track and between the angle-bars, the result being from eight to fifteen men, more or less, must be employed, because it is frequently found necessary not only to lift the rail bodily, but to hold it while it is entering into its place between said angle-bars.

The prime object of my invention is to reduce to a minimum the manual handling of rails, and particularly in lowering them from the pioneer car to their operative position on the ties, and this in such a manner that quickness in laying both ties and rails is promoted, all of which is of the greatest importance in view of the substantial increase and, it might be said, the gradual increasing in the weight of modern rails as compared with

those used but a few years ago and the present demand for economical quick track-laying.

A further object of my invention is to provide a railroad-track-laying apparatus entirely dispensing with the necessity of a dolly and at least two men to carry it and at the same time provide for simultaneously conducting both rails forward to their operative position above the ties on which they are to be placed, while in the meantime the ties are being placed in their operative position, so that as the last tie is laid on the road-bed the rails are ready to be and may immediately be lowered into their operative position on the ties and in position to form a continuous part of the track already laid.

A further object is to provide means by which while the rail is suspended in close proximity to the ties it may be swung into a temporary bridle-rod, as well as between the angle-plates of the adjacent laid rail, by a single man as compared with several men heretofore required to do so under the practice heretofore necessitating the resting of the rail on the ties and afterward lifting the rail to engagement with the bridle-rod or angle-plates of the adjacent track.

A further object is to provide mechanical means by which a rail may be quickly conducted off a pioneer car to a point above its operative position on the railroad-bed ties, positively maintained in that position, quickly lowered to be heeled into place at the end of the track, and when too low for this purpose quickly raised to the best possible position for heeling.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the said drawings, Figure 1 illustrates a side elevation of a pioneer car upon which the devices embodying my invention are mounted, with a rail lowered to the position for heeling it in to the track and the tie-car in a position to move forward and dump ties piled thereon. Fig. 2 is a top plan view of the same; Fig. 3, a detailed side elevation showing the tie-car in its tilted position for dumping its

load of ties upon the road-bed. Fig. 4 is a front end elevation of Figs. 1 and 2; Fig. 5, an enlarged detail of one of the pivoted brace-bars of the long boom; Fig. 6, an enlarged transverse section of the same on the line 6-6 of Fig. 5, showing the means by which it is detachably secured to its sustaining-beam. Fig. 7 is a transverse section through the boom, showing the connection therewith of pivoting said brace-bars. Fig. 8 is a top plan view of the two-part hinged dog employed in connection with the chain-blocks by means of which the rails are discharged from the car upon the ties on the road-bed; Fig. 9, a transverse section through the long boom, showing in end elevation the stop for the trolley and by means of which the forward movement of the chain-block is limited; Fig. 10, a detailed side elevation of the same with dotted lines indicating one of the trolley-wheels in contact therewith. Fig. 11 is an enlarged detail of the chain-block mechanism, showing the position of the various levers and dogs for operating the same with dotted lines indicating their engaging teeth and the band of the friction-brake for the chain-block pulley; Fig. 12, a side elevation of the same and Fig. 13 an end elevation looking in the direction indicated by the arrow 14 at Fig. 12.

Similar numerals of reference indicate the same parts in the several figures of the drawings.

15 indicates an ordinary railroad flat-car having the usual trucks 16 and truss-rod structure 17, running upon a track 18, composed of rails 19 and 20, supported upon ties 21, on which flat-car is a track composed of ties 21^a and rails 22 for a tie-car 23, which, as shown in Fig. 1, is loaded with ties 24. Between the rails 22 of the tie-car at suitable intervals are rollers 25, over and upon which rails are conducted to the point whence they are lowered upon ties previously discharged and laid upon the road-bed. Car 15, together with its further superstructure presently to be described, is in practice the forward car of a train and for this reason is commonly designated the "pioneer car," it being understood that there are a number of cars coupled rearly thereof upon which are stored ties and rails and which are provided with a continuation of the track 22 and with rollers 25 for the rails at suitable intervals thereof. Secured to the pioneer car in the usual manner are side bars 26, which project substantially beyond the forward end of the car 15 and suspended, as it were, in this position by means of a framework composed of upright posts 27 at each side of the car, connected at their top by a cross-bar 28 and at their bottom by a cross-bar 29, (see Fig. 1,) and truss-rods 30 and 31 passing over the posts 27 and secured at their forward end (see Fig. 1) near the forward extremity of the side bars 26 and

at their rear end to the side sills of the flat-car 15 and toward the rear end thereof, a turn-buckle 32 serving to adjust the tension of said truss-rods and to maintain the forward end of the side bars 26 slightly elevated, as indicated in Fig. 1. The side bars 26, together with their cross-bars, serve as a means of supporting and suspending a continuation of the tie-car track 22 and also of suspending a bar 33, in which at their center of length are journaled rollers 34 and 35, projecting on each side of the bar 33, one end of which rollers only is provided with flanges 36 and 37, respectively, and which serve as supports for the rails while they are being moved forward beyond the journal-car to their operative position. The bar 33 is braced by a bar 38, and the forward ends of the rails 22 project slightly beyond the bars 26 and are bent downwardly, as indicated at 39. A cross-bar 40 is secured to the bars, serving as a stop against which the tie-car abuts in delivering its load.

The tie-car is of the usual sliding-frame character—that is to say, the ties are supported on top of a frame whereby the momentum when the wheels of the tie-car strike the sill 40 slides forward from the position shown in Fig. 1 to the position shown in Fig. 3, thereby tilting the car and dumping the ties upon the road-bed, the bent end 39 of the rails serving as a stop for a lug 41 (see Fig. 3) on the under side of the sliding frame of the tie-car and serving to limit the downward movement of the forward end thereof in delivering its load.

The structure so far described conforms substantially to that shown in my Letters Patent No. 676,893, granted June 25, 1901, upon which my present invention is an improvement in that it provides means, presently to be described, by which the employment of manual labor for unloading rails from the car upon the ties and, in part, their operative position is entirely avoided and not only the unloading and laying of the rails is facilitated, but also of the ties.

Under my present invention the cross-sill 40 supports at the forward end of the side bars 26 uprights 42 and 43, (see Figs. 1 and 4,) connected at their upper ends by a top bar 44, and by means of braces 45 and 46, (see Fig. 1,) extending from the upper ends of the uprights 42 and 43 down to the side bars 26, which are bolted to these respective members, said uprights 42 and 43 being also connected with the uprights 27 by means of truss-rods 47, (see Fig. 1,) in which there are turn-buckles 48. The truss-rods 47, of which there are two, converge from the uprights 27 toward the center of length of the top bar 44 of the uprights on which at a short distance apart are secured yokes 49, in which are pivoted a number of truss-rods 50, 51, 52, and 53, hereinafter described, by means of

pivot-bolts 54 and 55. The uprights 42 and 43 are individually braced toward their upper ends by cross brace-bars 56 and 57 and also by a cross-bar 58 below the same and about midway the height of the uprights 42 and 43, which brace-bar 58 serves as a support for and to which is pivoted, so as to swing horizontally, a boom, which for convenience of description I shall designate as a "long" boom 59, which extends forward beyond the end of the bars 26 a distance corresponding to a little more than half the length of a rail, which boom for the purposes of strength and convenience has a trackway for a trolley, hereinafter described, is preferably composed of an I-beam, the outer end of which is suspended and sustained by brace-rods 51, 52, and 53, in which respectively are turnbuckles 63, the upper end of which rods are provided with eyes through which passes the pivoting-bolt 55 in the yoke 49.

Secured to the long boom is a transverse plate 64, (see Figs. 2 and 7,) to the projecting edge of which by bolts 65 and suitable eyes are hinged diverging brace-bars 66 and 67, in turn secured on top of the bar 58 by means of an eyebolt 68, the shank of which projects below the under side of the cross-bar 58 and has thereon a nut 69, preferably provided with a handle 70 for convenience of manipulation, which pivoted brace-bars when the long boom is in its operative position are tightened upon the cross-bar 58, but which may be loosened for the purposes of swinging the boom to an operative position upon a curve in the road-bed and then tightened; but any other means by which the long boom may be thus adjusted and held in its adjusted position may be employed.

Pivoted to a yoke 71, (see Fig. 1,) secured to the cross-bar 58, is a short boom 72, to which is rigidly secured and suspended a chain-block 73, similar to a chain-block 74 on the long boom, but which is hinged to a trolley 75, supported and guided by the lower flanges of the I-beam and which is limited in its forward movement along the I-beam by means of a stop 76, (see Figs. 1, 3, 9, and 10,) composed of opposing parts 77, adapted to embrace the flange of the I-beam and be adjustably clamped thereto by a bolt or bolts 78, (see Fig. 9,) the contacting portion of which is preferably curved (see Fig. 10) to correspond with the curvatures of the trolley-wheel. Suspended from the free end of the chain of the chain-blocks 73 and 74 are rail-tongs 80 of the usual construction.

In discharging rails from the pioneer car to their operative position on the ties and relatively to the adjacent track it is desirable that the rail shall be quickly bodily lifted and moved off the pioneer car to a point over its operative position as nearly as may be, that it shall be maintained in this position without any possibility of slipping and

quickly lowered to its operative position, and that if without intention, as frequently happens, it shall be lowered too far it may without delay be raised sufficiently above the ties to heel it by swinging it to its operative position and then after heeling be bodily lowered upon the ties, and it is to these ends that the pulleys 73 and 74, which are precisely alike, are of a peculiar construction, as will now be described.

Chain-pulley structure 73, for example, has its pulley-wheel journaled in an ordinary supporting-frame in the usual manner upon a shaft 81 (see Figs. 11, 12, and 13) and the groove thereof provided with teeth 82 for a chain 83, secured at one end to the frame—as, for example, to a shaft 83^a, hereinafter described, or some other part of the frame. The fore end of this chain 83 carries the rail-tongs 80, the chain being prevented from accidentally disengaging from the wheel by a guard 84, formed of bent sheet metal and suspended by its shank 85 from the shaft 86, bolts 87, passing through the shank, serving to hold the guard to form and from detachment from the shaft 86. The outer edge of one flange of the chain-pulley is plain and surrounded by a brake-band 88, faced in the usual manner with blocks of wood 89 or other suitable material, one end of which brake-band is secured to the shaft 83^a and the other end to the short arm 90 of a lever 91, secured to or pivoted on the shaft 83^a. Lever 91 is provided with a hand-grasp 92 or other suitable means for pulling its long arm downwardly against the resistance of a spring 93, one end of which is secured to the lever or to a clamp or band 94 thereon and the other end (upper end) to a lug 95, secured to the frame of the structure, the brake being normally off when the long arm of the lever is in its elevated position. The other periphery or edge of the flange of the pulley-wheel is provided with teeth 96, forming a circular rack adapted to be engaged by a jointed pawl 97, which is pivoted on the shaft 86 (see Fig. 11) and is actuated to disengage it from the teeth by the engagement of the lug 98 by means of a pin 99 on a lever 100, pivoted upon a shaft 101, the lever 100 being maintained normally in an elevated position by means of a spring 102, secured at one end to a projecting end thereof and at its opposite and lower end to a lug 103 on the frame, the long arm of which lever may be depressed through the medium of a rope 104.

The two parts of the jointed pawl are respectively provided with parallel lugs 105, a single lug 106 passed between the parallel lugs (see Fig. 8) and a pivot 107, and the tooth part of the pawl has a reversely-beveled rear end, as indicated in Fig. 11 at 108, opposed by a straight end on the rear or shank portion of the pawl, so that when the pawl is in engagement with the ratchet, as shown in Fig. 11, there is a V-space between said ends

below their pivot connection, the purpose of which is to provide for disengaging the pawl from the ratchet by a receding movement before lifting it from engagement with the ratchet-tooth. In other words, with the pawl 97 in engagement with the ratchet, as indicated in Fig. 11, by depressing the lever 100, as shown in dotted lines, the pin 99 will be caused to press down upon the lug 98, with the result that the forward end of the pawl will swing inwardly upon its pivoted joint, and therefore away from the tooth, until its lower beveled edge strikes the opposing edge of its shank portion, in which position the pawl is entirely free from the ratchet and may by continuing the downward pull on the lever 100 be lifted to the position shown in dotted lines in Fig. 11.

The object in having the pawl first recede before being lifted above the plane of its engagement with the ratchet-tooth is to relieve the pawl from weight and constant strain during its release and which is important in view of the weight it must sustain. In other words, when the rail is suspended from the chain-block its weight is entirely on the pawl 97, and in order to shift this weight to the band-brake in order to quicken the lowering of the rail to its operative position the band-brake is first set and then the pawl released, as above described, and therefore with entire absence of lateral strain thereon or cutting of the point of the pawl or the ratchet-tooth. The pawl 97 is, in effect, a stop-pawl—that is to say, so long as it is in engagement with the ratchet it stops the lowering of a rail, but does not prevent the reverse movement of the pulley required to lift the rail and which is provided for through the medium of a lever 109, pivoted to a bolt 110, (see Figs. 11 and 13,) projecting through the sides of the frame, and a pawl 111, secured to the short arm by a pivot 111^a of said lever. In the normal position of the lever 109 it is elevated and the pawl disengaged from the ratchet, the lever 109 being provided with a rope and handle 112 to bring it within convenient reach of the operator, a spring 113 (indicated in Fig. 12) serving to maintain the lever normally in an elevated position by having the lower end of the spring secured to the lever 109 and its upper end to a pin 114 on the frame. Pawl 111 is provided on its pivot with a spring 115, yieldingly holding it toward the ratchet, (see Fig. 13,) and with a lateral flange 111^b, projecting over and adapted to engage the upper edge of the lever 109, by which engagement the pawl is maintained from contact with the ratchet when the lever 109 is in its elevated and normal position and, as shown in Fig. 12, the spring 115 on a pivot of the pawl serving to maintain its flange in contact with the lever.

In actuation of the pulley by the pawl 111 in order to lift the rail suspended from the

pulley-chain the depression of the long-arm lever 109 lifts the pawl to engagement with the ratchet, and as the depression of the lever is continued the pawl is gradually lifted to the limit of its upward stroke, which swings it outwardly on its pivot, so that its flange 111^b recedes from contact with the lever.

When the pawl 111 recedes to the limit of its upward stroke, the jointed pawl 97 is by gravity engaged with and holds the pulley against a receding movement until the pawl 111 is again depressed to its initial engagement with the ratchet, the spring 115 serving to move the pawl 111 inwardly toward the ratchet until stopped by engagement of the flange with its lever.

The operation of my apparatus is as follows: A load of ties on a tie-car is first moved forward and the ties dumped upon the road-bed and the tie-car pushed back out of the way to about the position shown in Fig. 1 and as quickly as possible, and then while the ties are being placed in their operative position on the road-bed two rails are then run forward on the rollers until their centers are about over the roller 34, in which position the rail may be held by projecting its rear end under a cross-bar or stop 26^a (see Figs. 1 and 2) in a plane above the rollers carrying the rail, whereby the forward end of the rail is prevented from dropping down should the rail be run too far. While in this position an attendant engages the rail-tongs with a rail near its center, which is then carried forward off the pioneer car to a point about over where it is to be laid, the slack in the chain being in the meantime taken up, so that as soon as the rail clears the car it is held against descending by the jointed pawl and its ratchet, and thereby the rail is maintained in this elevation while and until the ties are properly placed, whereupon the friction band-brake is set by pulling down on the lever 91, and then the jointed pawl 97 is disengaged from its ratchet, as before described, by pulling down on the lever 100, leaving the entire weight of the rail to be sustained by the friction-brake, which provides a convenient means for quickly lowering the rail to its operative position on the ties. In order to facilitate the placing of the rail in its operative position, it is first lowered to a point slightly above the ties, when by taking hold of its forward end it may be heeled to place against the adjacent track. The heeling operation of the rail to place is, however, greatly facilitated by the employment of the stop 76 (see Figs. 1 and 10) when properly adjusted—that is to say, adjusted as indicated in Fig. 1—that the weight of the rail is utilized for heeling it into place and for which purpose the stop is made adjustable for rails varying in length or the relative position of the rail to the track at that moment. As soon as the rails are heeled to place then the forward end

is gradually lowered to its proper position on the ties by releasing it from the friction-brake. In this connection it should be observed that the drawings illustrate the rails as laid broken joints—i. e., the center of one rail is about opposite the end of the opposing rail, as indicated at 116, toward the lower side of Fig. 2, at a point near which the pioneer-car wheels are located in Fig. 1 and on the other side at a point 117 in said figure, Fig. 1 illustrating the lowering of the rail at the latter side.

In practice my improved apparatus by reason of its long boom 59 and short boom 72 for discharging from the pioneer car and suspending over the road-bed while and as soon as the just previously discharged ties have been put in place, both of said rails requiring only one man to lower a rail to its operative position in the track.

In the handling of the rails suspended from the short boom a trolley is unnecessary, for the reason that the rail may be pushed forward until the tongs of the chain-block are secured just about the center of length, and therefore the weight of the rail when the rail may be pushed laterally off the plain rollers 34 and 35, whereas the rail suspended by the long boom must be carried forward until it clears the roller 34, and as a result of which the outer ends of these rollers may be and are flanged to prevent the lateral displacement of the advancing rail therefrom.

From the foregoing it will be understood by employing mechanical means described for discharging the rails from the pioneer car and heeling them to place a less number of men are not only required for handling the rails, but the work of laying both ties and rails is made practically continuous—that is to say, so far as is possible owing to the difference in manipulation they respectively require—for, as before pointed out, the operation of removing the rails bodily from the car progresses while the ties are being laid and without any interference in their laying.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a railway-track-laying apparatus the combination with a pioneer car of laterally-swinging long and short booms projecting beyond the forward end thereof, of a trackway on the long boom and means for suspending and moving a rail thereon, substantially as described.

2. In a railway-track-laying apparatus the combination with a pioneer car of a boom projecting forwardly therefrom, a traveling carriage mounted thereon, means for suspending a rail from said carriage over the road-bed, and a friction-brake suspended from said carriage for lowering the rail thereon, substantially as described.

3. In a railway-track-laying apparatus the

combination with a pioneer car of a boom projecting forwardly therefrom, a traveling carriage mounted thereon, means for suspending a rail from said carriage over the road-bed, a mechanical means for lowering the rails thereon, and a pawl-and-ratchet device suspended from said carriage for raising a rail therefrom, substantially as described.

4. In a railway-track-laying apparatus the combination with a pioneer car of a boom projecting forwardly beyond said car, a trackway thereon, a carriage running on said trackway and means for suspending a rail from said carriage, an adjustable stop limiting the forward movement of the carriage and whereby the weight of a rail may be utilized to heel it to its operative position on a road-bed, substantially as described.

5. In a railway-track-laying apparatus the combination with the pioneer car of a boom projecting forwardly beyond the same, a pivot upon which said boom may swing laterally and brace-bars pivoted at one end to said boom and adjustably secured to a fixed portion of the pioneer car, substantially as described.

6. In a railway-track-laying apparatus the combination with a pioneer car of a boom projecting forwardly beyond the same and in a plane substantially above the platform of said car, means providing for horizontal movement of said boom when laying track upon a curve, a carriage supported and guided upon said boom, a chain-block suspending a rail therefrom and a stop limiting the forward movement of said carriage, substantially as described.

7. In a railway-track-laying apparatus the combination with a pioneer car of a long boom and a short boom projecting forwardly beyond said car, a pivotal support for said booms whereby their forward ends may be swung laterally, means for simultaneously suspending rails from both of said booms and mechanism for lowering said rails to their operative position upon the road-bed, substantially as described.

8. In a railway-track-laying apparatus the combination with a pioneer car of a boom or booms projecting forwardly therefrom, means secured to said boom or booms for suspending a rail or rails therefrom, holding devices positively supporting said rails in their elevated position and a friction-brake for lowering said rails, substantially as described.

9. In a railway-track-laying apparatus the combination with a pioneer car of a boom secured thereto and projecting forwardly thereof, means for suspending a rail therefrom, a pawl-and-ratchet device positively maintaining said rail in its elevated position, a friction-brake and means for disengaging said pawl and ratchet whereby the weight of a railroad-rail is shifted from the latter to a

friction-brake and in turn lowered thereby to its operative position on a road-bed, substantially as described.

10. In a railway-track-laying apparatus
5 the combination with a pioneer car a track thereon, a tie-car mounted upon said track, a boom pivoted to the pioneer car at a point above the operating position of the tie-car, a chain-block suspended from said boom and
10 means for connecting said chain-block with a rail whereby said rail may be disengaged from the pioneer car, suspended over its operative position on the road-bed during the laying of ties thereon and means for quickly
15 lowering said rail and heeling it to place on said ties, substantially as described.

11. In a railway-track-laying apparatus the combination with a pioneer car of a long and a short boom projecting forwardly adjacent
20 cent opposite sides thereof, means for simultaneously suspending rails therefrom over their operative position on a road-bed, means

for conducting one of said rails forwardly beyond the position of the other, and means for lowering both of said rails to place whereby
25 both sides of a track may be simultaneously laid with broken joints, substantially as described.

12. In a railway-track-laying apparatus the combination with a pioneer car of a boom
30 projected forwardly beyond the same, means secured to said boom for suspending and lowering the rails therefrom, dogs and a ratchet for lowering and raising said rail relative to a road-bed, and means whereby one of
35 said dogs is held from engagement with said ratchet during the operation of the other dog, substantially as described.

In witness whereof I have hereunto set my hand this 2d day of April, 1906.

GEORGE F. H. HICKS.

In presence of—

E. C. MANCHESTER,
JNO. G. ELLIOTT.