(No Model.) 3 Sheets—Sheet 1.

M. SMITH.

MACHINE FOR LAYING RAILROAD TRACKS.

No. 386,613. Patented July 24, 1888.

Fig. 1.

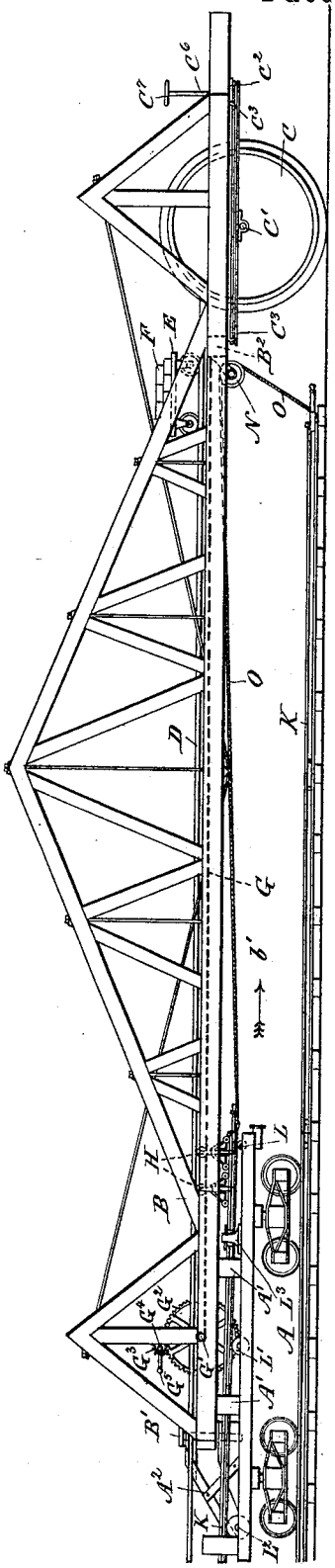


Fig. 3.

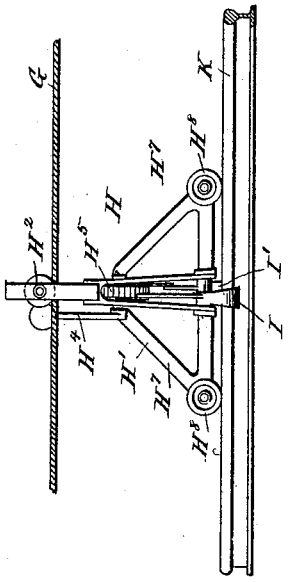
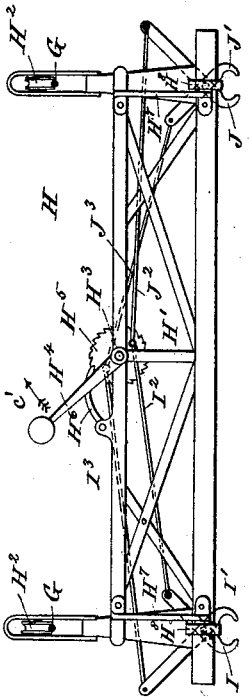


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 4.

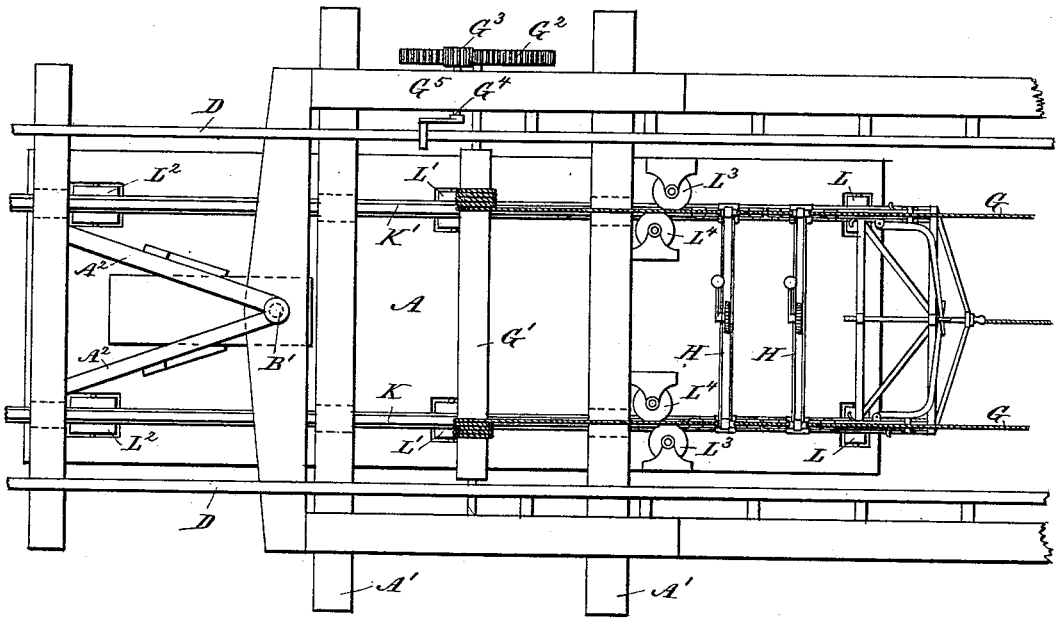

Fig. 5.

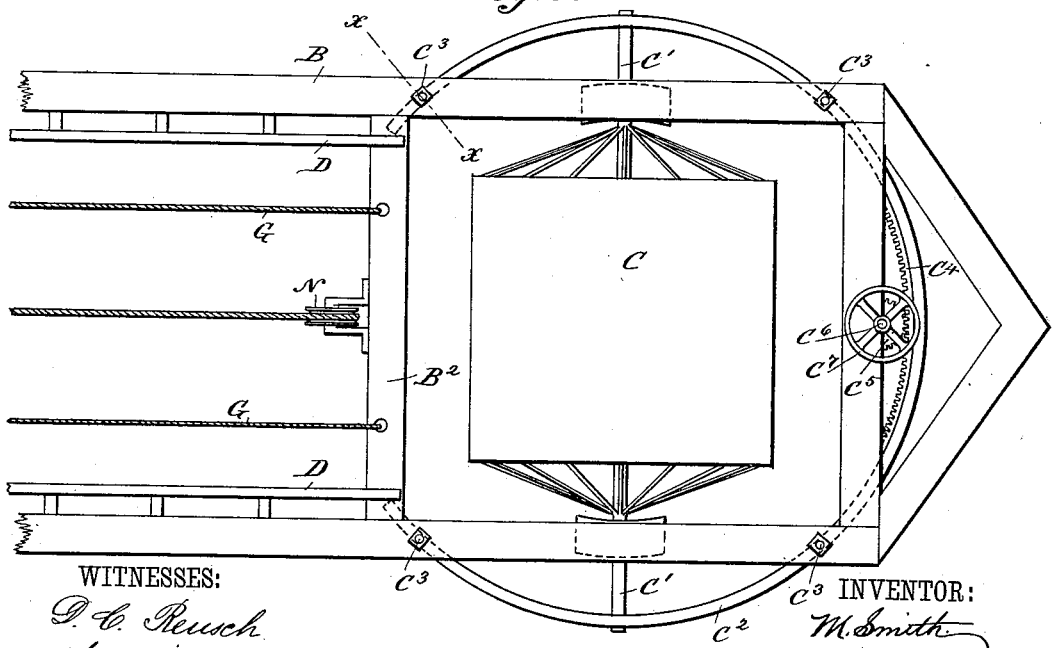

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Fig. 6.

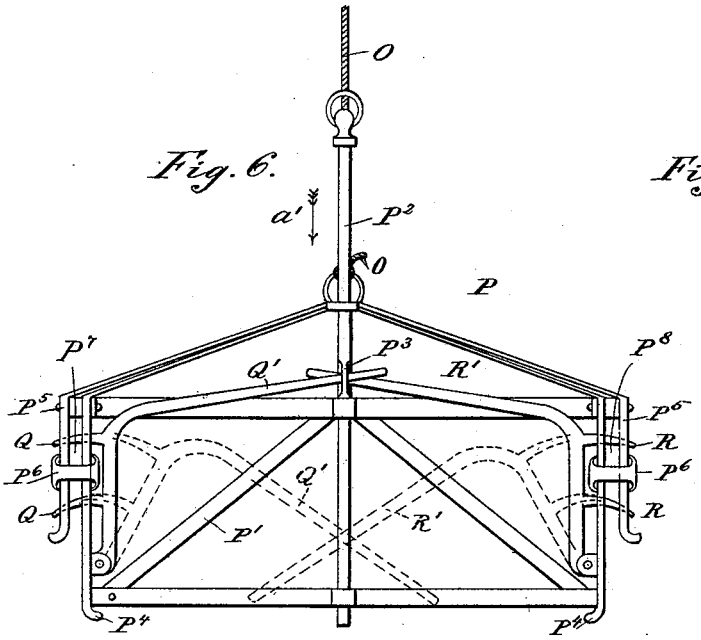


Fig. 7.

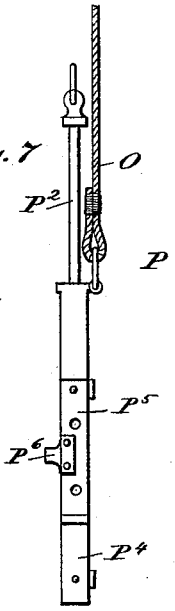


Fig. 8.

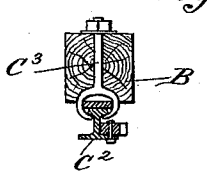
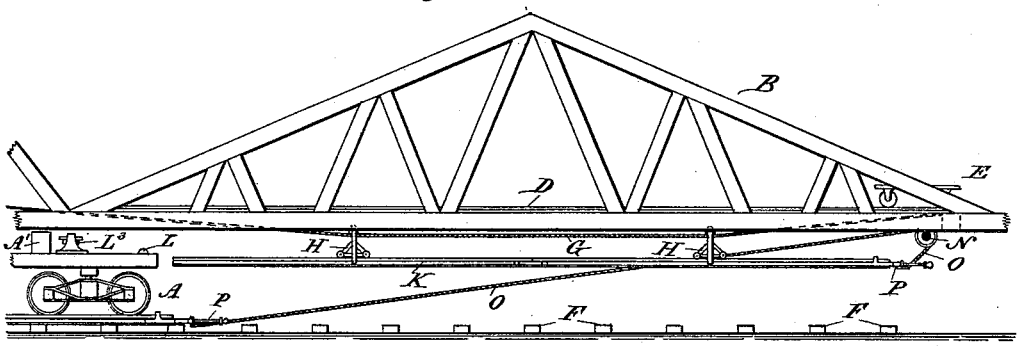


Fig. 9.



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UNITED STATES PATENT OFFICE.

MARION SMITH, OF DURHAM, KANSAS.

MACHINE FOR LAYING RAILROAD-TRACKS.

SPECIFICATION forming part of Letters Patent No. 386,613, dated July 24, 1888.

Application filed January 6, 1888. Serial No. 259,938. (No model.)

To all whom it may concern:

Be it known that I, MARION SMITH, of Durham, in the county of Marion and State of Kansas, have invented a new and Improved Machine for Laying Railroad-Tracks, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved machine for laying railroad-tracks with great rapidity, accuracy, and considerable saving of labor.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

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

Figure 1 is a side elevation of the improvement. Fig. 2 is an enlarged side elevation of the track-rail gripping and supporting device. Fig. 3 is an end elevation of the same. Fig. 4 is an enlarged plan view of the rear end of the improvement. Fig. 5 is an enlarged plan view of the front end of the same. Fig. 6 is an enlarged plan view of the track-rail gaging and drawing device. Fig. 7 is a side elevation of the same. Fig. 8 is an enlarged sectional elevation of part of the improvement on the line *x x* of Fig. 5; and Fig. 9 is a side elevation of part of the improvement, showing a rail suspended from the frame above the ties, ready for being put in place.

The improved railroad-track-laying machine is provided with a flat railroad-car, A, of any approved construction, and provided on its platform with transverse beams A′, on which rests the rear end of the truss-frame B, of any approved construction, and supported at its front end on the wheel C, secured to a shaft, C′, mounted to rotate in bearings formed on the under side of part of a ring-rail, C^2, mounted to slide in the forked end of a bolt, C^3, secured to the truss-frame B, as shown in Figs. 5 and 8. On the front part of the ring-rail C^2 is secured a segment of a gear-wheel, C^4, meshing with a pinion, C^5, secured to a vertical shaft, C^6, mounted to rotate in suitable bearings secured to the truss-frame B. On the upper end of the vertical shaft C^6 is secured a hand-wheel, C^7, for turning the said shaft C^6 and its pinion C^5, and thereby imparting a circular motion to the ring-rail C^2, so that the shaft C′, supported on the said ring, is turned into an angular position in relation to the center line of the truss-frame B, and the wheel C will travel in a curve.

The rear end of the truss-frame B swings on a king-bolt, B′, supported by suitable braces, A^2, secured to the flat railroad-car A. Said king bolt B′ passes through the truss-frame B and into a suitable block secured to the platform of the flat car A. The truss frame B supports on its bottom the rails D D, on which is held to travel a car, E, carrying the ties F to be placed on the road-bed. Said rails D extend to the rear end of the flat railroad-car A, which is connected with one or more cars carrying the ties and rails to be placed on the road-bed. The car E can thus be conveniently loaded from the supplementary cars at the rear end of the flat car A and then pushed forward to the ends of the rails D, as shown in Fig. 1, for unloading the ties.

The front ends of the rails D are supported on a cross-beam, B^2, of the truss-frame B, and on the said cross-beam B^2 are also secured the ends of the ropes G G, extending to the rear of the truss-frame B, and being wound upon a drum, G′, mounted transversely in suitable bearings on the truss-frame B, and carrying a gear-wheel, G^2, which meshes into a pinion, G^3, secured to a shaft, G^4, mounted to rotate in suitable bearings on the truss-frame B, and carrying a crank-arm, G^5, for turning the said shaft G^4 and the pinion G^3, so that the latter imparts a rotary motion to the gear-wheel G^2 and the drum G′.

On the ropes G G are held to travel the rail gripping or supporting devices H. (Plainly shown in Figs. 2 and 3.) Each of the gripping and supporting devices H is provided with a frame, H′, of suitable construction, and carrying at its upper ends the pulleys H^2, traveling on the said ropes G, and thereby suspending the said devices H from the said ropes G.

H^7 are supports secured to the opposite ends of the frame H′ at right angles thereto, and at the outer corners of said frames are mounted rollers H^8, the axes of which are at right angles to the axes of the gripping-jaws, so as to

rest upon the tread of the rail, as shown in Fig. 3, and steady it while it is being lowered to the road-bed.

In the middle of the frame H′ is mounted to rotate a shaft, H^3, on which is secured a handle, H^4, for turning the said shaft. On the latter is fastened a ratchet-wheel, H^5, engaged by a pawl, H^6, to prevent said ratchet-wheel H^5 from rotating in the wrong direction when locked in position. On a crank-pin on one face of the ratchet-wheel H^5 are pivoted the inner ends of the links I^2 and J^2, extending in opposite directions and pivotally connected at their outer ends with the gripping-jaws I and J, respectively pivoted at the outer ends of the frame H′. On the other face of the ratchet-wheel H^5, and diametrically opposite the crank-pin of the links I^2 and J^2, is secured a second crank-pin, with which are connected the inner ends of the links I^3 and J^3, also extending in opposite directions and pivotally connected at their outer ends with the gripping jaws I′ and J′, pivoted on the pivot of the gripping-jaws I and J and operating in connection with the latter.

The gripping-jaws I I′ and J J′ operate simultaneously and serve to grip the heads of the rails K to be laid on the ties F to form the railroad-track. The distance between the centers of the jaws I I′ and J J′ is governed by the gage of the track to be laid. The jaws I I′ and J J′ are opened and closed simultaneously by operating the arm H^4, so as to turn the shaft H^3 and the ratchet-wheel H^5. The latter, by its crank-pins and the links I^2 I^3 and J^2 J^3, opens or closes the jaws I I′ and J J′, according to the direction in which the arm H^4 is moved. When the jaws are closed, the pawl H^6 holds them all in a locked position. The gripping and supporting devices H, just described, travel on the ropes G when secured to the track-rails K and when the latter are moved forward by the gaging and drawing devices P, now to be described.

In the middle and in the under side of the end beam, B^2, is supported a pulley, N, over which passes a rope, O, connected at each end with a gaging and drawing device, P. The latter is provided with a frame, P′, of suitable construction, such as is shown in Figs. 6 and 7. In the middle of the frame P′ is held to slide longitudinally a rod, P^2, provided with an eye, P^3, through which pass the inner ends of the L-shaped levers Q′ and R′, extending in opposite directions and being fulcrumed to the bars P^4 of the frame P′. The levers Q′ and R′ are each provided with outwardly-extending prongs or pins Q and R, respectively adapted to pass through apertures formed in the end bars P^4, and also through apertures formed in the short bars P^5, held parallel with the end bars P^4 and connected with each other by a cross-piece, P^6.

The ends of the track-rails K extend into the spaces formed between the bars P^4 and P^5, the cross-piece P^6 resting on the head of the rail. The distance between the spaces P^7 P^8, formed by the end bars P^4 and P^5, depends on the gage of the railroad-track, and the said distance corresponds with the distance between the jaws I I′ and J J′, above referred to. The prongs or pins Q and R are adapted to engage the apertures formed in the shanks of the rails K, and used for the bolts of the fish-plates connecting two successive rails with each other in the usual manner. The rails K are inserted between the bars P^4 and P^5 when the levers Q′ and R′ are in the position shown in dotted lines in Fig. 6—that is, when the rod P^2 is pressed inward in the direction of the arrow *a′*, so that the said levers Q′ and R′ are caused to swing inward to the position shown in said dotted lines. When the rails are inserted between the bars P^4 and P^5, the operator pulls the rod P^2 outward in the inverse direction of the arrow *a′*, so that the levers Q′ and R′ are swung outward, and prongs Q and R pass through the apertures in the bars P^4 and P^5, and also through the apertures in the rails used for the bolts of the fish-plates.

The track-rails K are stored on the supplementary cars connected with the flat railroad-car A, and are moved on the same whenever it is desirable to use them. In order to facilitate the shifting of the rails from the supplementary cars to the flat car A, I provide the latter on each side with rollers L, L′, and L^2, mounted on the top of the platform or flat railroad car A. The rollers L L′ L^2 are placed in line with each other and increase in size from the front to the rear, so that the rails K are held in an inclined position and are easily run off from the rollers L, L′, and L^2 and drawn in the direction of the arrow *b′*. On top of the flat railroad-car A are also mounted the sets of rollers L^3 and L^4, adapted to engage the heads of the rails K, placed on the rollers L, L′, and L^2. The sets of rollers L^3 and L^4 are not placed opposite each other, so as to permit rails to pass easily off of the rollers L, L′, and L^2 whenever the truss frame B stands in angular position to the flat railroad-car A.

The operation is as follows: The car E is moved on the rails D to the rear end of the truss-frame B, is loaded with ties from the supplementary cars, and then moved forward to the ends of the rails D at the cross-beam B^2. Two rails K are moved from the supplemental cars onto the two sets of rollers L^2, L′, and L, and to the front ends of the said rails K is secured the gaging and drawing device P in the manner above described. The other device P at the other end of the rope O is secured to the rails already laid on the road-bed, as shown in Fig. 1. Two or more gripping or supporting devices, H, are held on the ropes G, as shown in Fig. 1, and the gripping-jaws I and I′ and J J′ of each device engage the heads of the rails held on the rollers L, L′, and L^2; but the said jaws are not closed, so that when the rails move forward a certain distance the said gripping and supporting devices H remain in their original position and simply permit the heads of the rails to slip through the gripping-

jaws I I′ and J J′. The several parts just described are then in the position shown in Fig. 1. The entire machine is now moved forward by a locomotive or other motor operating against the rear of the supplementary cars connected with the track-laying machine A, as before mentioned. On the forward movement of the latter the several ties F on the car E are dropped down in front of the cross-beam B^2 and placed suitable distances apart on the road-bed, as shown in Fig. 9. The forward movement of the machine causes the rope O to exert a pull on the gaging and drawing device connected with the rails on the flat railroad-car A, so that the said rails are moved off of the rollers L, L′, and L^2. As soon as the rails have moved a suitable distance from the car A, the operator closes the jaws I I′ and J J′ of the first gripping device H by throwing the lever H^4 in the direction of the arrow *c′*. (Shown in Fig. 2.) The jaws I I′ and J J′ thus grip the head of the rail firmly, whereby the entire gripping device H is moved forward with the forward movement of the said rail K, caused by the action of the rope O, as above described, and the other gripping device remains stationary until the two rails have nearly passed off of the car, and then the respective jaws I I′ and J J′ of the said gripping device are closed in the same manner as described above in relation to the other gripping device H, so that the two flat rails are firmly supported on the said gripping and supporting devices H, traveling on the ropes G, as shown in Fig. 9. When the rails K have left the front of the car A, the latter stands at or near the ends of the rails already laid, and the rails supported by the gripping and supporting devices H are held directly above the ties F, placed on the railroad-bed on the forward movement of the machine, as before mentioned. The operator now releases the gaging and drawing device P from the ends of the rails already laid, and then he turns the crank-arm G^5, so as to rotate the drum G′ for unwinding the ropes G G, whereby the said ropes G are lowered, and consequently lower the gripping devices H H, supporting the rails K K. Said rails are lowered until they rest on the ties F, after which the operator throws the levers H^4 of the two gripping devices H H in the inverse direction of the arrow *c′*, so as to open the jaws I I′ and J J′. The operator now turns the crank arm G^5 in the opposite direction, so as to wind up the ropes G on the drum G′ until the said ropes are drawn taut, and the gripping and supporting devices H H are moved backward again to their original positions, as shown in Fig. 1, to be again engaged with a new set of rails placed on the car A, as above described. When the rails are laid on the ties F, they can be at once spiked down, as the said rails are held to the exact gage by the gripping and supporting devices H and the gaging and drawing device P, held on the front ends of the said rails. The released gaging and drawing device P at the inner end of the rope O is now again secured to the outer ends of the new rails K, placed on the car A, and the car E is again run to the rear and loaded with a new set of ties F, and again moved forward, and the entire operation above described is repeated.

When the machine is to travel on a curved road bed, the operator turns the hand-wheel C^7 so as to turn the shaft C^6, which, with its pinion C^5, imparts a turning motion to the ring-rail C^2, on which the wheel C is mounted. The latter, with its shaft C′, is thus turned and travels in line with the curve of the road-bed.

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

1. In a track-laying machine, the combination, with a flat railroad-car, of a truss-frame supported and pivoted at its rear end on said car, a ring held to turn on the front end of the said truss-frame, and a wheel mounted in the said ring to support the front end of the said truss-frame, substantially as shown and described.

2. In a track-laying machine, the combination, with a flat railroad-car, of a truss-frame supported and pivoted at its rear end on the said car, a ring held to turn on the front end of the said truss-frame, a wheel mounted in the said ring to support the front end of the said truss-frame, a segmental gear-wheel secured to the said ring, a pinion meshing into the said segmental gear-wheel, and a shaft carrying the said pinion and a hand-wheel, substantially as shown and described.

3. In a track-laying machine, a flat railroad-car, a truss-frame supported at its rear end on the said flat car, and a wheel supporting the front end of the said truss-frame, in combination with a rope passing over a pulley held on the said truss-frame, and a gaging and drawing device, P, held on each end of the said rope, substantially as shown and described.

4. In a track-laying machine, a flat railroad-car, a truss-frame supported and pivoted at its rear end on the said car, and a wheel supporting the front end of the said truss-frame, in combination with adjustable ropes held on the said truss-frame, and the gripping and supporting devices H, adapted to travel on the said ropes, substantially as shown and described.

5. In a track-laying machine, a flat railroad-car, a truss-frame supported and pivoted at its rear end on the said car, and a wheel supporting the front end of the said truss-frame, in combination with a rope passing over a pulley held on the said truss-frame, a gaging and drawing device, P, held on each end of the said rope, a set of adjustable ropes held on the said truss-frame, and the gripping and supporting devices H, adapted to travel on the said ropes, substantially as shown and described.

6. In a track-laying machine, a flat railroad-car and rollers mounted at each side of the said car to support the track-rails, in combination with a truss-frame supported at its rear end on the said car, a wheel supporting the

front end of the said truss-frame, a pulley mounted on the under side of the said truss-frame, a rope passing over the said pulley, and the gaging and drawing devices P, secured to the ends of the said rope, one being adapted to be fastened to the track-rails on the said rollers and the other to the rails already laid, substantially as shown and described.

7. In a track-laying machine, a flat railroad-car, sets of rollers mounted in longitudinal lines on the sides of the said car and adapted to support the track-rails, and sets of pulleys mounted horizontally on top of the said flat car, in combination with a truss-frame supported and pivoted at its rear end on the said car, an adjustable wheel held on the front of the said truss-frame, a pulley mounted on the under side of the said truss-frame, a rope passing over the said pulley, and the gaging and drawing devices P, secured to the ends of the said rope, substantially as shown and described.

8. In a track-laying machine, a flat railroad-car, a truss-frame supported and pivoted at its rear end on the said car, and a wheel supporting the front end of the said truss-frame, in combination with a set of ropes each secured by one end to the said truss-frame, and a drum mounted to rotate in the said truss-frame and carrying the other ends of the said ropes, substantially as shown and described.

9. In a track laying machine, a rail gripping and supporting device consisting of a frame, means for raising and lowering it, two sets of jaws mounted upon said frame the distance of the gage of the track apart, an operating-lever mounted on said frame, and connections between said lever and the said jaws, whereby when the lever is thrown both pairs of jaws will be simultaneously opened or closed, substantially as set forth.

10. In a gripping and supporting device, the combination, with a frame mounted to travel on ropes, of two sets of jaws pivoted on the said frame, links pivotally connected with the said sets of jaws, a wheel to which the said links are pivoted, and a hand-lever for turning the said wheel so as to open and close the said sets of jaws simultaneously, substantially as shown and described.

11. In a gripping and supporting device, the combination, with a frame mounted to travel on ropes, of two sets of jaws pivoted on the said frame, links pivotally connected with the said sets of jaws, a wheel in which the said links are pivoted, a hand-lever for turning the said wheel so as to open and close the said sets of jaws simultaneously, and a pawl adapted to engage ratchet-teeth formed on the said wheel for locking the said jaws in a closed position, substantially as shown and described.

12. In a track-laying machine, a gaging and drawing device provided with two sets of rail guide-bars, and levers having prongs or pins for locking the rails in place in the sets of guide-bars, substantially as shown and described.

13. In a gaging and drawing device, the combination, with a frame provided on each end with two guide-bars, between which the rail is placed, a rod mounted to slide in the middle of the said frame, levers pivoted on the said frame and connected at their free ends with the said sliding rod, and pins or prongs formed on the said levers and adapted to engage the end apertures in the rails held in the said guide-bars, substantially as shown and described.

14. In a track-laying machine, a gripping and supporting device provided with two sets of jaws placed the distance of the gage of the track apart, and arms or supports at opposite sides of the jaws, having rollers journaled at right angles to the axes of the said jaws and adapted to rest upon the tread of a rail held by said jaws, substantially as set forth.

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Witnesses:
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JOHN SMITH.