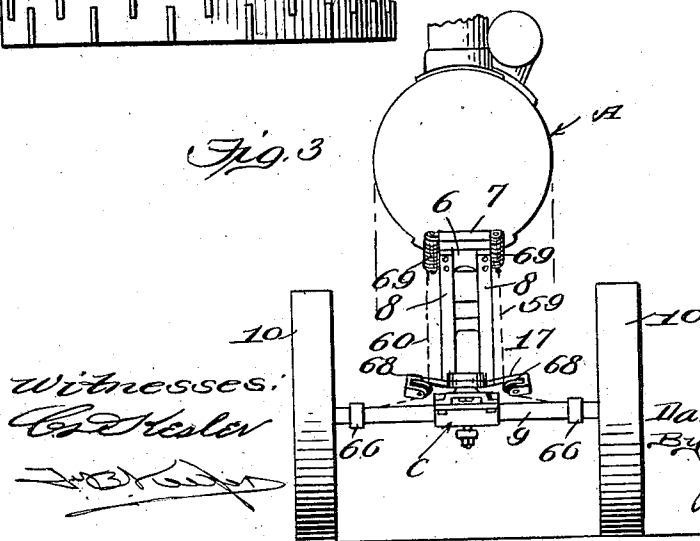
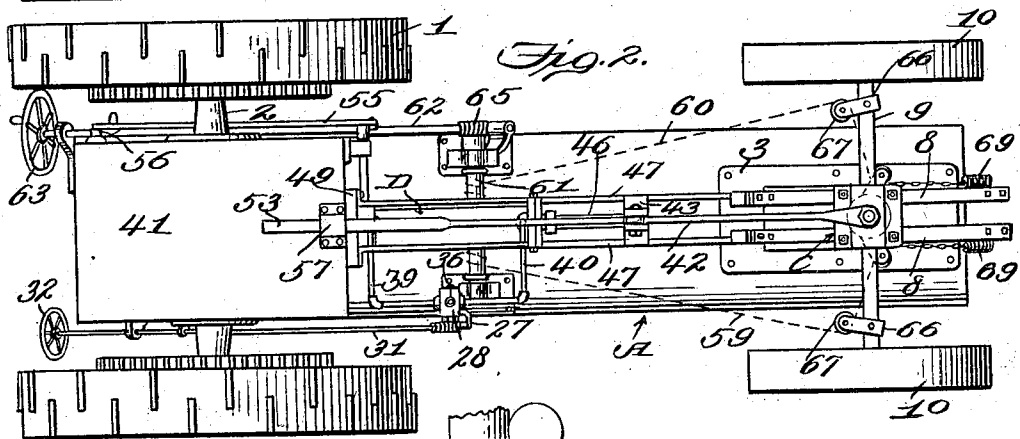
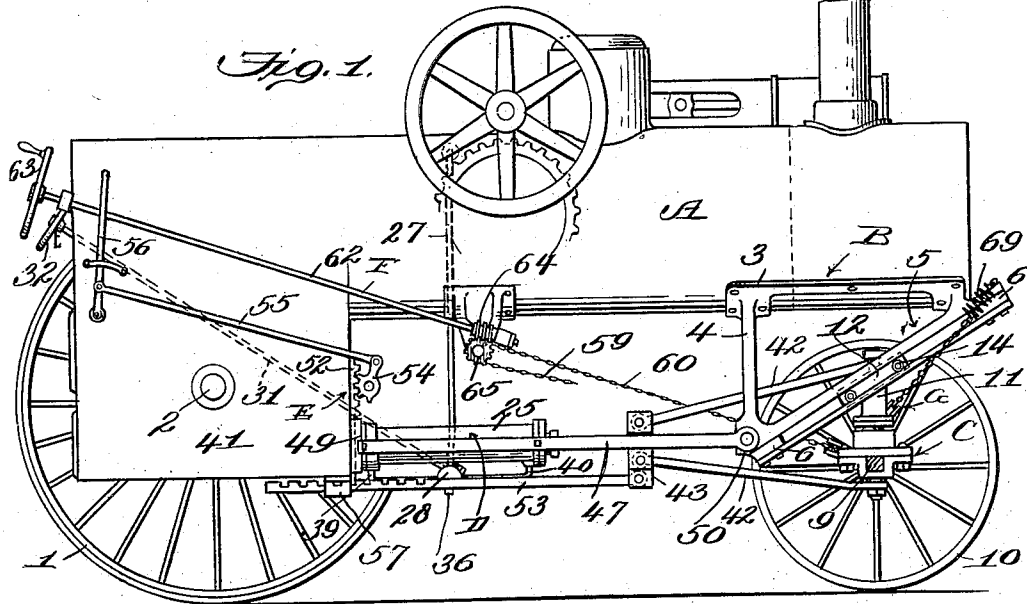


D. T. BROWN.
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APPLICATION FILED APR. 8, 1910.

981,373.

Patented Jan. 10, 1911.

3 SHEETS—SHEET 1.

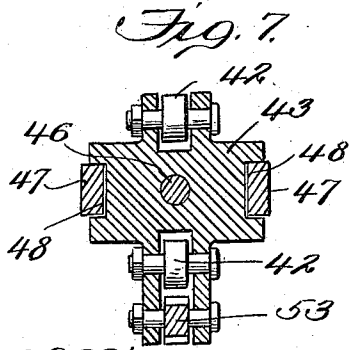
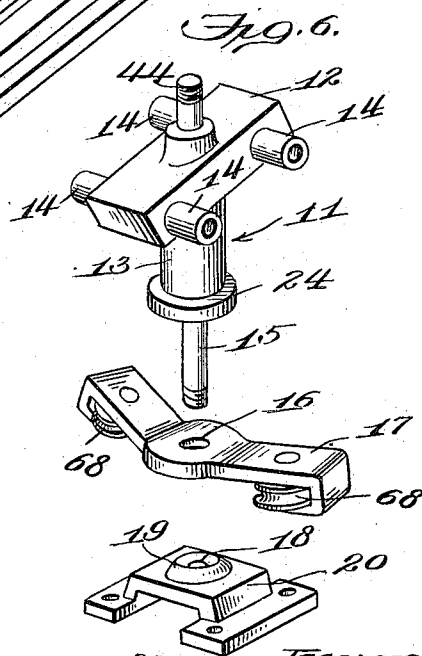
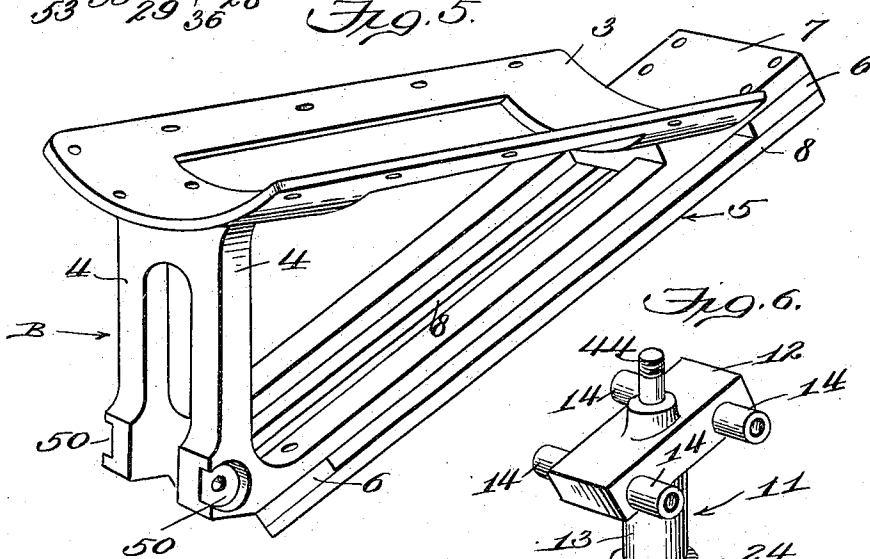
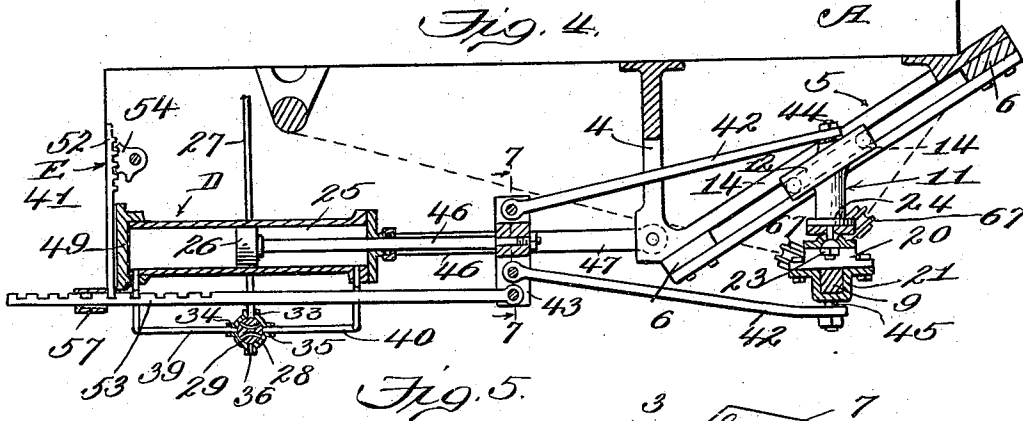


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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

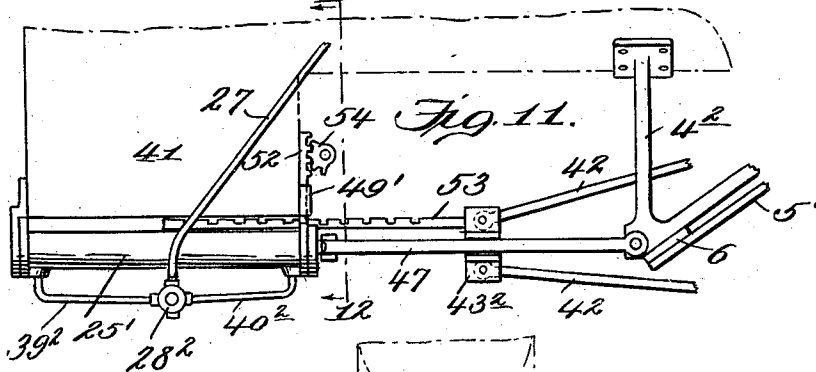
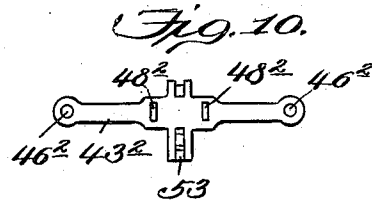
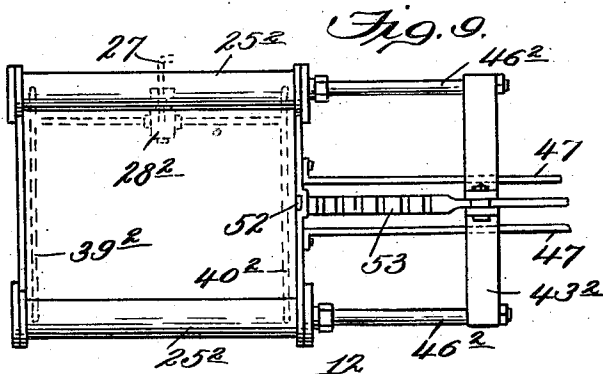
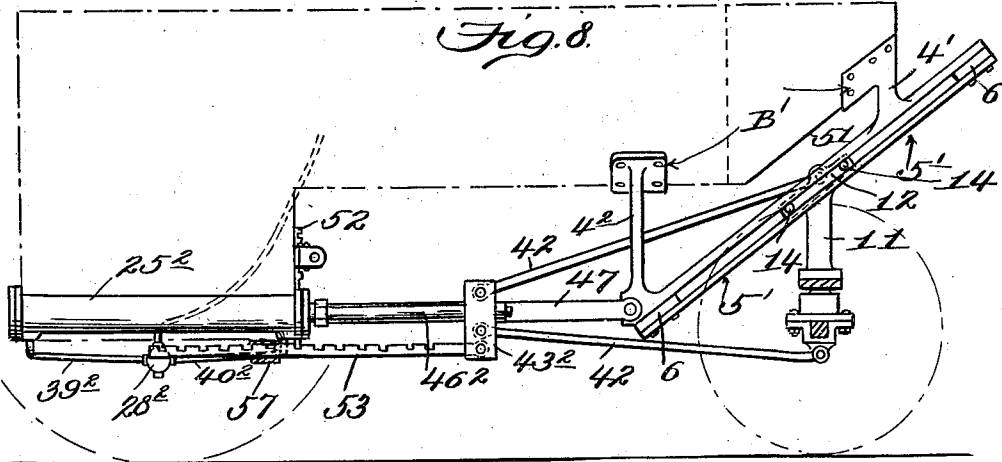
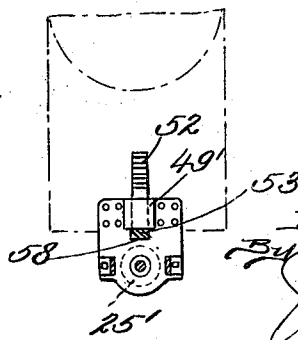


Fig. 12.



Witnesses:
[Signature]
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Daniel T. Brown

By *[Signature]*
Att'y.

UNITED STATES PATENT OFFICE.

DANIEL T. BROWN, OF CELINA, TEXAS.

LEVELING DEVICE FOR TRACTION-ENGINES.

981,373.

Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed April 8, 1910. Serial No. 554,221.

To all whom it may concern:

Be it known that I, DANIEL T. BROWN, a citizen of the United States, residing at Celina, in the county of Collin and State of Texas, have invented new and useful Improvements in Leveling Devices for Traction-Engines, of which the following is a specification.

The present invention comprehends the production of an extremely simple and efficient mechanism for raising and lowering the front end of the boiler of a traction or other engine, so as to maintain the boiler in an approximately horizontal position irrespective of the character of the road over which the engine is traveling, or of the ground at the point where it is stationed. This mechanism, briefly described, comprises merely an inclined track which is connected to the lower surface of the engine at the front end thereof, and is engaged by a member carried by the movable front truck of the engine, the arrangement being such that when the truck is moved rearwardly, or toward the engine wheels, the travel of the afore-mentioned member along the track will effect an upward movement of the front end of the boiler, the reverse movement of the truck effecting the lowering of the boiler end.

More especially, the invention contemplates the production of an improved mechanism for locking the front truck against movement after having been adjusted, thereby insuring the retention of the boiler in horizontal position, and it further contemplates the production of an improved fluid-operated mechanism for effecting the shifting of the truck.

It finally resides in the provision of an equalizing device associated with said truck and with the chains by which the same is swung or steered, such device serving to maintain a constant tension on said chains throughout the entire range adjustment of the truck.

A structural embodiment of the invention is illustrated in the accompanying drawings wherein—

Figure 1 is a side elevation of a traction engine equipped with said invention in its preferred and simplest form; Fig. 2 is a bottom plan view, and Fig. 3 a front elevation of Fig. 1; Fig. 4 is a longitudinal vertical sectional view of the invention;

Fig. 5 is an enlarged perspective view of the track and the supporting bracket by which the same is carried; Fig. 6 is a similar view of the truck-carried member which travels along the track, the parts of said member being shown as separated from each other; Fig. 7 is an enlarged sectional view taken on the line 7—7 of Fig. 4; Fig. 8 is a side elevation of a modified form of the invention; Fig. 9 is a fragmental plan view of Fig. 8; Fig. 10 is a front elevation of the cross-head shown in Fig. 8; Fig. 11 is a side elevation of a further modification; and Fig. 12 is a transverse vertical section taken on the line 12—12 of Fig. 11.

Reference being had to said drawings, and to the characters marked thereon, A indicates in a general manner the boiler of the engine, B the track-carrying bracket located at the front end of the engine, C the front truck associated with said bracket, D the mechanism for effecting the bodily movement of the truck, E the locking mechanism for retaining the truck in adjusted position, F the steering mechanism, and G the equalizing device with which the last-mentioned mechanism is associated. The driving mechanism may be of any preferred or conventional type, and hence requires neither specific illustration nor description. The rear wheels or tractors 1, actuated by the driving mechanism, are mounted on the rear axle 2, through the medium of which the rear end of the boiler is pivotally supported, as is customary.

The track-carrying bracket B, in the present construction, consists, as shown in Fig. 5, of a body plate, or portion, 3, a pair of spaced legs 4 depending from the rear end thereof, and the track element 5. This element is inclined upwardly and forwardly, its rear or lower end being connected directly to the lower ends of legs 4, and its upper or forward end to the front end of plate 3, beyond which latter it extends an appreciable distance. Said track element comprises a pair of parallel sections separated by spacers 6, the upper section being constituted by a longitudinally-slotted plate-like member 7, preferably integral with the parts 3 and 4, and the lower section by a pair of bars 8 arranged directly beneath the legs resultant from the slotting of plate 7. These legs, and the aforementioned bars 8 thus constitute, respectively, the upper and lower pairs of

rails of the track. The body plate 3 is bent to conform to the lower surface of the boiler, and is bolted or otherwise secured thereto.

With the bracket B above described, there
 5 is associated the front truck C comprising the axle 9 and the wheels 10. It is arranged both for a bodily movement toward and from the tractors 1, and for a swinging movement, the latter movement permitting
 10 the engine to be steered. Said truck carries a rocking member 11 arranged for connection with the bracket B, this member comprising a block 12 mounted upon a standard 13 and set at the same angle of inclination
 15 as the track, said block fitting in the space between the right and left-hand pairs of track rails and being provided with pairs of lateral rollers 14 projecting into the spaces between the upper and lower pairs of rails.
 20 Standard 13 is formed with a depending stem 15 which projects through a central aperture 16 in a strap 17, and through a registering aperture 18 in a central boss 19 formed upon the upper or bridge member 20
 25 of a clamp, the lower member 21 of which straddles axle 9 and is bolted to said bridge member. The inner surface of boss 19 is concaved and constitutes a bearing for the convex portion or boss 22 of a nut 23 threaded
 30 upon the lower terminal of stem 15. At the point where said stem joins the standard 13, the latter is preferably formed with an enlargement or collar 24 constituting a bearing which rests upon the flattened central portion
 35 of the strap 17, the latter being arranged to swing or turn freely upon the stem and the clamp bridge member.

The bodily movement, or shifting of truck C, as opposed to its swinging or turning
 40 movement, is effected by means of the mechanism D. This mechanism is preferably fluid-operated, and, in the construction shown in Figs. 1, 2 and 4, comprises a single cylinder 25 wherein a piston 26 works. Fluid is
 45 supplied to said cylinder by way of a pipe 27 which, in the present instance, leads from the boiler, as shown in Fig. 1, though no limitation to such arrangement is contemplated. At its lower end, this pipe opens
 50 into a casing 28 wherein is located a four-way valve 29 operatively connected to a rod 31 which extends toward the rear end of the boiler and terminates in a handle 32 arranged within easy reach of the engineer.
 55 The valve casing 28, in addition to the opening or port 33 wherein the end of the supply pipe is fitted, is additionally provided with a pair of outlet openings or ports 34 and 35, and with an exhaust port 36, the last-mentioned port opening to the atmosphere. The
 60 two passages formed in the valve are brought into communication with the several ports during the operation of the valve, as will be apparent, the ports 34 and 35 having
 65 fitted therein the inner ends of the

branch pipes 39 and 40 which open at their outer ends into ports formed in the cylinder ends.

In the preferred and simplest form of the invention, the cylinder 25 is arranged directly in advance of and has its rear head 49
 70 connected to the front wall of the fire-box 41 of the boiler, but this arrangement may be varied by disposing the cylinder beneath the bottom wall of the fire-box, as shown in
 75 Figs. 11 and 12, wherein it is designated by the numeral 25', its front and rear heads being formed with extensions suitably fastened to the corresponding walls of the fire-box. A further modification, to the extent
 80 of substituting a pair of cylinders 25² for the single cylinder is illustrated in Figs. 8 and 9, the valve casing 28² being arranged between the double-branch pipes 39² and 40². In this instance, the cylinders are arranged
 85 against the opposite side walls of the fire-box.

The connection between the mechanism D and the truck C is effected through the medium of a pair of rods 42 which are pivoted
 90 at their rear or inner ends to a cross-head 43, and at their front or outer ends to pins 44 and 45 provided respectively upon block 12 and the lower clamp member 21. The cross-head 43 to which the front end of the
 95 piston stem 46 is rigidly secured, is supported by parallel horizontal braces 47 fitted in seats 48 formed in the opposite sides of the cross-head, as shown in Fig. 7, the rear ends of the braces being secured to the rear
 100 cylinder head 49, and the front ends to the legs 4 of bracket B, said legs being preferably formed with seats 50 for the reception of the brace ends. This arrangement is followed out in both instances of the single
 105 cylinder construction; where the two-cylinder construction is employed, the cross-head 43² shown in Fig. 10 is made use of, the ends of the piston stems 46² being fastened to those of said cross-head, which latter is formed with openings 48² through which the
 110 braces pass.

The operation of as much of the invention as has been described may be stated as follows: When the motive fluid is admitted
 115 into the cylinder or cylinders, in front of the piston or pistons, the latter will be forced rearwardly, drawing the cross-head in the same direction. This movement of the cross-head will effect a corresponding
 120 bodily movement of the truck C, owing to the rod connections 42 between said cross-head and the rocking member 11 and truck axle 9. As said truck moves rearwardly, the block 12 will ride downwardly in the inclined
 125 track 5, thereby elevating the front end of the boiler, as will be apparent. When the truck is forced forwardly by admitting the fluid behind the piston or pistons, the block will be caused to travel upwardly in its
 13

track, thus permitting the depression of the boiler end.

Where a greater range of adjustment than that provided for by the track shown in Figs. 1, 4 and 5, is required, the lower front portion of the smoke box of the boiler may be cut away, as indicated by the numeral 51 in Fig. 8, thus enabling a track 5' of increased length to be employed. This track is attached to a support B' comprising a pair of brackets 4' and 4², the body plate or portion 3 being omitted in this construction.

In order to maintain the boiler in position after having been adjusted, the locking mechanism E is provided. This mechanism comprises essentially a latch 52, a notched bar 53 associated therewith, and an operating device for the latch. The latch is arranged vertically against the front wall of the fire-box and is in the form of a toothed bar engaged by a suitably mounted toothed rocker 54 connected by a rod 55 to the operating lever 56. The lower portion of the latch is held and guided in a recess or seat in the adjacent cylinder head, and its lower end is designed for engagement in the notches in the bar 53. This bar has its front end fastened to the cross-head 43 or 43², and its rear end, in the construction shown in Figs. 1, 2, 4 and 8, is movable through a supporting and guide bracket 57 fastened to the bottom wall of the fire-box. In the construction shown in Figs. 11 and 12, the afore-mentioned bracket is omitted, the bar end projecting through an opening 58 in an extension of the front cylinder head 49'. Owing to the connection of the front end of bar 53 to the cross-head, said bar will be moved with the latter when the adjusting mechanism D is actuated, and, in consequence, when truck C has been shifted into the required position, the latch, which has previously been raised, may be lowered and engaged with the corresponding notch of said bar 53, thereby locking the truck against further movement.

The mechanism F for steering the engine includes primarily a pair of chains 59 and 60 connected at their rear ends with a windlass 61, about which latter they are adapted to be reversely wound, and an operating rod 62 having a hand wheel 63 or the like, secured to its rear end, and a worm 64 to its front end, said worm engaging a worm wheel 65 fastened to the windlass shaft. The truck axle 9 has pivoted thereto a pair of strap brackets 66 each of which carries a pulley 67 around which the adjacent steering chain is led. In like manner the strap 17 is provided at its ends with a pair of pulleys 68 around which said chains are passed, said pulleys being arranged at an angle to the horizontal, so as to direct the chains upwardly toward the front end of bracket B,

to which latter they are connected by springs 69. The pivotal attachment of the brackets 66 to the truck axle, the pivotal mounting of strap 17 upon the bridge member 20, and the provision of the springs 69 insure the free turning of the truck during the steering operation, and also serve to equalize the tension upon the chains at such time irrespective of the position of the truck with reference to the boiler. The elements just specified constitute, therefore, the equalizing mechanism G originally referred to.

From the foregoing, it will be apparent that the truck may be readily adjusted longitudinally of the boiler, and that such adjustment will have the effect of raising or lowering the latter according to the direction in which the truck is moved; that the truck may be locked against further movement after having once been adjusted; that the engine may be steered by turning or swinging the truck through the medium of the steering chains; and that the tension exerted upon said chains is equalized at all times irrespective of the position of the truck. Further description of the invention and its mode of operation is deemed unnecessary.

I claim as my invention:

1. In an engine, the combination, with a boiler and a movable front truck; of mechanism for moving said truck longitudinally of the boiler; connections between said boiler and said truck for raising and lowering the former during the movement of the latter; and a locking mechanism for retaining the truck in adjusted position comprising a notched member, a latch arranged to engage the same, and means for operating the latch.

2. In an engine, the combination, with a boiler and a movable front truck; of a cylinder secured to the boiler; a piston working in the cylinder and connected with the truck; means for supplying motive fluid to said cylinder for operating said piston, to move said truck longitudinally of the boiler; and connections between said truck and boiler for raising and lowering the latter during the movements of the former.

3. In an engine, the combination, with a boiler, and a movable front truck; of an inclined track secured to the boiler; a member secured to the truck and arranged to travel along the track; and fluid-actuated mechanism secured to the boiler and having one element thereof connected to said truck for bodily advancing and retracting the latter longitudinally of said boiler, and said member longitudinally of said track, to raise and lower said boiler.

4. In an engine, the combination, with a boiler, and a movable front truck; of an inclined track secured to the boiler; a member secured to the truck and arranged to travel along the track; an endwise movable member arranged longitudinally beneath

- said boiler and having its front end connected with said traveling member and with said truck; means secured to said boiler for supporting said endwise-movable member; and means for bodily advancing and retracting said endwise-movable member, to move said traveling member and said truck correspondingly, for raising and lowering said boiler.
5. In an engine, the combination, with a boiler, and a movable front truck; of an inclined track secured to the boiler; a member secured to the truck and arranged to travel along the track; a cylinder secured to the boiler; a piston working in the cylinder and connected with said truck; and means for supplying motive fluid to said cylinder for operating said piston, for bodily advancing and retracting said truck longitudinally of said boiler, and said member longitudinally of said track, to raise and lower said boiler.
6. In an engine, the combination, with a boiler and a movable front truck; of mechanism for moving said truck longitudinally of the boiler; connections between said truck and boiler for raising and lowering the latter during the movements of the former; mechanism including a pair of flexible elements connected with said truck, for swinging the same, to steer the engine; and means connected with said flexible elements for equalizing the tension thereon irrespective of the position of said truck.
7. In an engine, the combination, with a boiler and a movable front truck; of mechanism for moving said truck longitudinally of the boiler; connections between said truck and boiler for raising and lowering the latter during the movements of the former; locking mechanism for retaining said truck in adjusted position; mechanism including a pair of flexible elements connected with said truck, for swinging the same, to steer the engine; and means connected with said flexible elements for equalizing the tension thereon irrespective of the position of said truck.
8. In an engine, the combination, with a boiler, and a movable front truck constituting companion elements; of an inclined track secured to one element; a member secured to the other element and engaged with said track; a cylinder secured to the boiler; a piston working in the cylinder and connected with the truck; and means for supplying motive fluid to said cylinder for operating said piston, to move said truck longitudinally of the boiler, for raising and lowering the latter.
9. In an engine, the combination, with a boiler and a movable front truck; of a fluid-

actuated piston carried by the boiler and connected with the truck, for moving said truck longitudinally of said boiler; connections between said truck and boiler for raising and lowering the latter during the movements of the former; and locking mechanism for retaining said truck in adjusted position.

10. In an engine, the combination, with a boiler and a movable front truck; of a fluid-actuated piston carried by the boiler and connected with the truck, for moving said truck longitudinally of said boiler; connections between said truck and boiler for raising and lowering the latter during the movements of the former; and mechanism connected with said truck for swinging the same, to steer the engine.

11. In an engine, the combination, with a boiler and a movable front truck; of a fluid-actuated piston carried by the boiler and connected with the truck, for moving said truck longitudinally of said boiler; connections between said truck and boiler for raising and lowering the latter during the movements of the former; locking mechanism for retaining the truck in adjusted position; and additional mechanism connected with said truck for swinging the same, to steer the engine.

12. In an engine, the combination, with a boiler and a movable front truck; of a fluid-actuated piston carried by the boiler and connected with the truck, for moving said truck longitudinally of said boiler; connections between said truck and boiler for raising and lowering the latter during the movements of the former; and locking mechanism associated with said piston for retaining said truck in adjusted position.

13. In an engine, the combination, with a boiler and a movable front truck; of mechanism for moving said truck longitudinally of the boiler comprising a movable operating member, a cross-head connected thereto, and connections between said cross-head and said truck; connections between said boiler and said truck for raising and lowering the former during the movement of the latter; and a locking mechanism for retaining the truck in adjusted position comprising a notched member connected to said cross-head and movable with the same, a latch arranged to engage said notched member, and means for operating the latch.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

DANIEL T. BROWN.

Witnesses:

ROBT. L. CLAYTON,
J. H. KERR.