

No. 626,484.

Patented June 6, 1899.

L. BROWN.

STEAM STEERING GEAR FOR PORTABLE ENGINES.

(Application filed Apr. 1, 1899.)

(No Model.)

Fig. 1

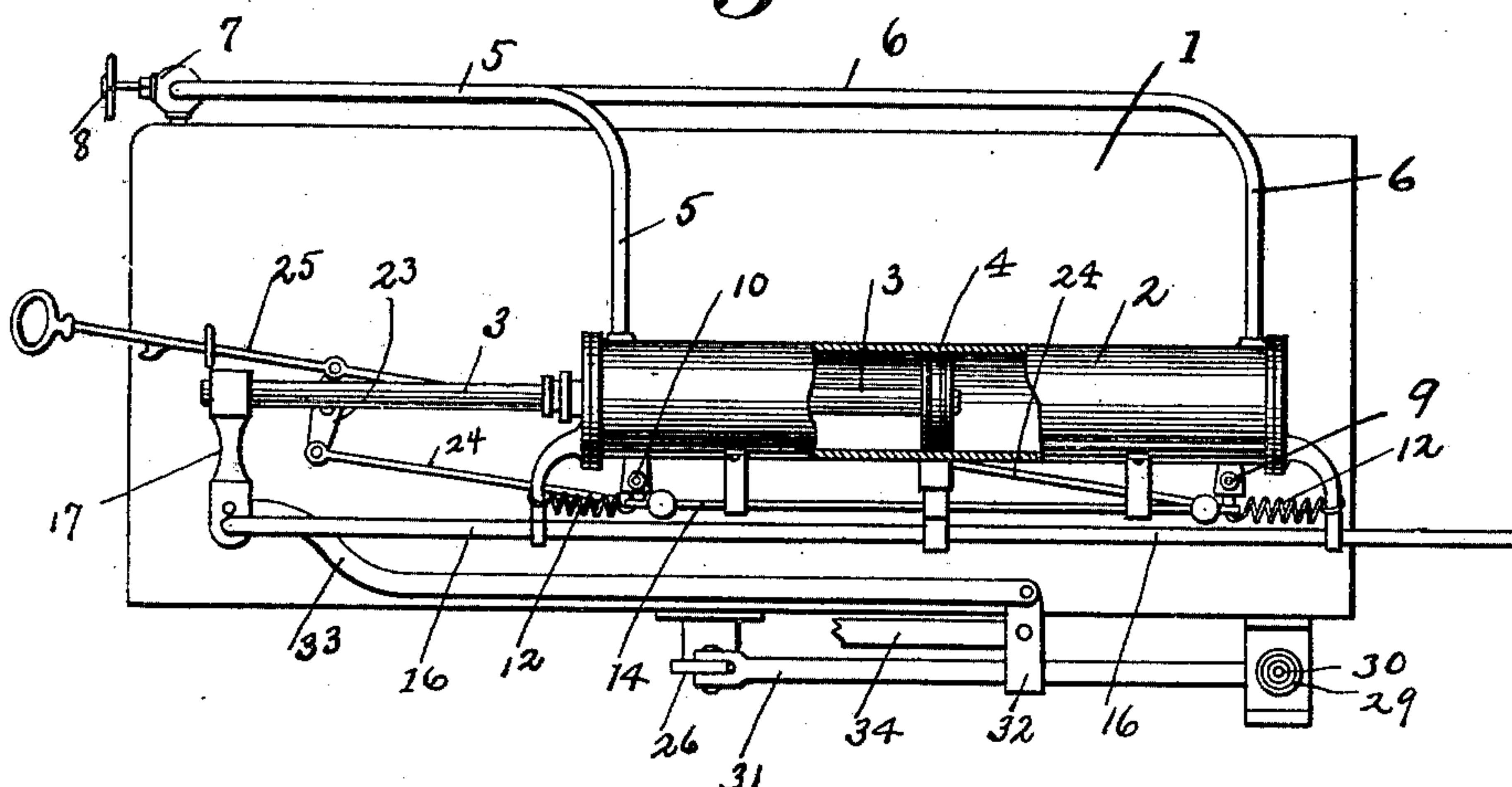
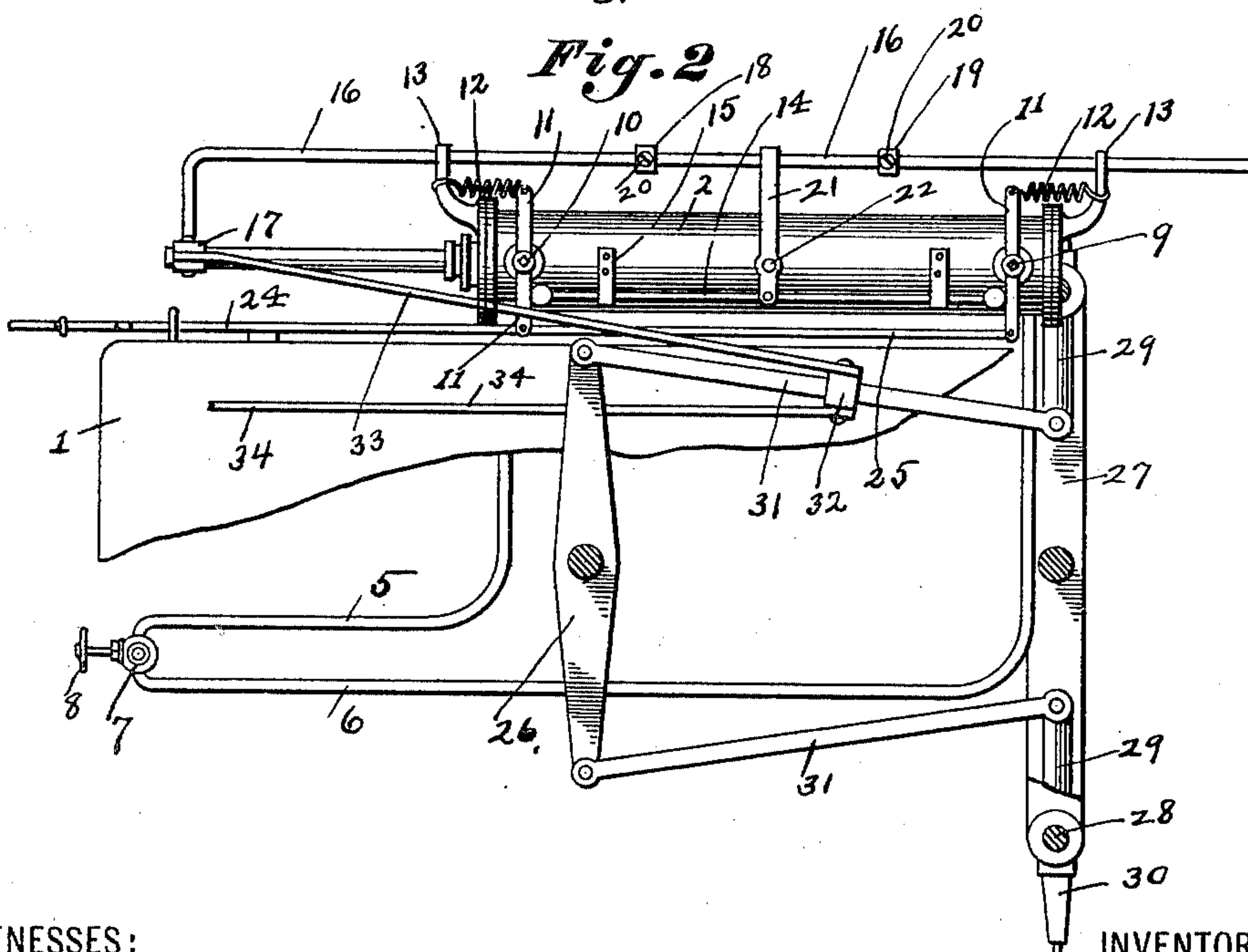


Fig. 2



WITNESSES:

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LEONARD BROWN, OF OTTERBEIN, INDIANA.

STEAM STEERING-GEAR FOR PORTABLE ENGINES.

SPECIFICATION forming part of Letters Patent No. 626,484, dated June 6, 1899.

Application filed April 1, 1899. Serial No. 711,354. (No model.)

To all whom it may concern:

Be it known that I, LEONARD BROWN, a citizen of the United States, residing at Otterbein, in the county of Benton and State of Indiana, have invented a certain new and useful Improvement in Steam Steering-Gears for Portable Engines, of which the following is a specification.

My invention relates to the improvement of steam-actuated steering-gears; and the objects of my invention are to provide that class of boilers or engines which are ordinarily carried on trucks, such as traction-engines and the like, with an improved steam-operated mechanism for changing the direction of movement of the front truck, to so construct and arrange the parts of my mechanism as to admit of the direction of movement of the forward truck being readily and effectively changed by the turning of a valve, to provide in conjunction therewith improved means for opening both of the cylinder-valves and draining said cylinder when desired, and to produce other improvements the details of construction and arrangement of parts of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved steam steering apparatus, showing the same in connection with a boiler; and Fig. 2 is an under side view of the same.

Similar numerals refer to similar parts throughout both views.

In carrying out my invention I support from the side or other part of a boiler 1 a horizontal steam-cylinder 2, the latter having working through its rear end a piston-rod 3, which on the inner side of said cylinder carries a piston-head 4.

5 and 6 represent steam-pipes which lead from opposite points of a valve-casing 7 to opposite end portions of the cylinder 2, said valve-casing 7 containing therein a suitable form of two-way valve, of which 8 represents the operating-handle.

9 and 10 represent, respectively, steam outlet or exhaust valves, which are arranged at points near the ends of the cylinder 2, the projecting stems of each of said valves having connected therewith the central portion

of a transverse controlling-bar 11. The exhaust-valves 9 and 10 are normally retained closed or the bars 11 are normally retained in such positions as to hold said exhaust-valves closed through the medium of springs 12, which serve to connect the outer ends of said valve-controlling bars 11 with cylinder end projecting arms 13. Between the inner end portions of the bars 11 I provide in the direction of the length of the cylinder a sliding rod 14, the latter being supported in suitable bearing-brackets 15 and being provided with rounded ends which normally contact with the inner faces of the bars 11. Supported to slide in the bracket-arms 13 is a longitudinally-arranged valve-operating rod 16, the forward end of which is connected with a downwardly-extending arm 17 of the forward end of the piston-rod 3. Between the bearing-arms 13 the rod 16 is provided with separated contact collars or lugs 18 and 19, the latter being, through the medium of set-screws 20, adapted to be adjusted with reference to their relative positions.

21 represents a lever which is fulcrumed in its inner end portion to the cylinder 2 at 22, the outer end of this lever 21 having the rod 16 between the stop-collars 18 and 19 pass loosely therethrough, while the inner end of said lever is fulcrumed to the center of the length of the rod 14.

To the side of the boiler 1 and near the rear end portion thereof I pivot the central portion of a lever 23. To the lower end of this lever I pivot or jointedly connect one end of a comparatively short valve-operating rod 24, which leads to and connects with the inner end of that bar 11 which is connected with and adapted to operate the valve 10. To the opposite end of the pivoted lever 23 is fulcrumed a longer valve-operating rod 25, the rear end of which is provided with a suitable handle-piece and the forward end of which is jointedly connected with the inner end of that bar 11 which controls the valve 9.

To the under side of the boiler-body I pivot the central portion of a gear bar or lever 26.

27 represents the centrally-pivoted front-truck bolster of the running-gear on which the engine is mounted, the end portions of this bolster being provided with downwardly-extending pivoted or journaled posts 28, each

of which, as set forth in my former application for improvement in steering-gear, Serial No. 705,602, filed February 16, 1899, has passing therethrough or projecting therefrom a short axle 29, the outer and spindle end portion 30 of which is designed to carry the ordinary forward ground-wheel. The inwardly-extending portions of these axles 29 are, through the medium of connecting-bars 31, jointly connected with the corresponding ends of the pivoted lever 26.

As indicated at 32, I provide one of the bars 31, near the center of its length, with a clip, with which is suitably connected one end of a steering-rod 33, the remaining end of the latter being suitably connected with the arm 17 of the piston-rod. I also may connect with the clip 32 a rearwardly-extending bar 34, which may lead to and connect with a hand-lever such as that shown and described in said former patent application.

For the purpose of illustrating the operation of my invention I will assume that the parts are in the position indicated in the drawings and that it is desired to so turn the axles 29 as to incline and change the direction of the wheels thereof to the left. In order to accomplish this, the valve-handle 8 is so turned as to direct steam from the boiler through said valve-casing into the pipe 6. The passage of steam from this pipe into the forward end of the cylinder 2 must, as will readily be seen, operate to drive the piston-head and piston-rod rearwardly, which, owing to a consequent rearward movement of the rod or bar 33 and the connection of the latter with one of the bars 31, must result in a swinging of the lever 26 and a consequent swinging of the wheel-bearing portions of the axles to the left. The rearward movement of the piston-head also causes a corresponding rearward movement of the rod 16, resulting when the piston-head arrives in the rear portion of the cylinder in a contact of the rod-lug 20 and outer end of the lever 21. The rearward swinging movement of the outer end of said lever 21 thus caused results in a forward movement of the rod 14, and through the pressure of the forward end of the latter against the inner portion of the forward valve-bar 11 the forward valve 9 is opened and the steam exhausted from the forward end portion of the cylinder. It is obvious that the position of the collar or lug 19 on the rod 16 may be such as to admit of the piston moving such distance within the cylinder as to provide the desired change in direction of the front truck before contact of the rod 14 with the valve-controlling bar 11, in which position said piston may be held by closing the valve 8. In order to turn the front truck to the right, it is obvious that the valve 8 must be so turned as to direct steam from the boiler into the rear feed-pipe 1, whereby the piston will be driven toward the forward end of the cylinder. In this case the rear exhaust-valve is opened at the proper time by the forward

swinging movement of the lever 21 and consequent contact of the rear end of the rod 14 with the rear bar 11.

In case it is desired at any time to drain the cylinder of steam or condensation it is obvious that both the exhaust-valves 9 and 10 may be simultaneously opened by a forward movement of the rod 25, which through its connections with the bars 11 will serve to turn the latter until both of said valves are in the open position.

If in the absence of steam or other cause it is desired to change the direction of the front truck by hand, it is obvious that the rearwardly-extending bar or rod 34 may be connected with any suitable hand-lever—such, for instance, as that shown in my said former application.

From the above-described construction and operation it will be seen that a boiler of that class which is ordinarily carried on trucks may have attached thereto my improved steam-actuated steering-gear and that said actuating mechanism is so constructed and arranged as to provide a positive means for controlling the direction of the movement of the trucks on which the same is mounted.

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

1. In a steering-gear-operating attachment for boilers, the combination with a steam-cylinder, steam-feed pipes leading into opposite ends thereof and connecting with a common source of steam-supply, means for directing steam through either of said pipes, a piston working in said cylinder and exhaust-ports for said cylinder, of pivoted wheel-carrying axles, a pivoted lever 26 in rear thereof, arms jointly connecting the ends of said lever with said axles and a rod connecting one of said arms with said piston-rod, substantially as specified.

2. In a steam gear-operating attachment for boilers, the combination with a steam-cylinder, steam-pipes leading into the ends thereof and means for directing steam from the boiler through either of said pipes, a normally-closed exhaust-valve in each end of said cylinder, valve-controlling bars 11 connected therewith and a rod extending between said valve-controlling bars, a piston working in said cylinder, a rod 16 carried by said piston, a fulcrumed lever 21 pivoted to said rod 14 and adjustable lugs on said rod 16 adapted to contact with said lever 21, of a forward truck, wheel-carrying axles pivoted in said truck, a central pivoted lever 26, arms jointly connecting the ends of said lever with said axles and a rod 33 connecting one of said arms with said piston-rod, substantially as specified.

3. In a steam gear-operating attachment for boilers, the combination with a steam-cylinder, steam-feed pipes leading into opposite ends thereof from a common source of steam-supply and means for passing steam through

either of said pipes, exhaust-valves arranged at each end of the cylinder, controlling-bars 11 connected with said exhaust-bars, springs 12 connected with said valve-controlling bars 5 and normally holding said exhaust-valves closed, a piston working in said cylinder, a pivoted lever 23, a rod 25 fulcrumed thereto and having its forward end connected with one of said exhaust-valve-controlling bars 10 and a rod 24 also fulcrumed to said lever 23 and having its forward end connected with

the remaining exhaust-valve-controlling bar, of a wheel-carrying truck, swinging wheel-carrying axles mounted therein and a connection between said axles and said piston-rod 15 whereby an inward or outward movement of the latter imparts a swinging movement to said axles, substantially as specified.

LEONARD BROWN.

In presence of—

P. H. TULLEY,

WILLIAM WACHTEL.