No. 695,401. Patented Mar. 11, 1902.

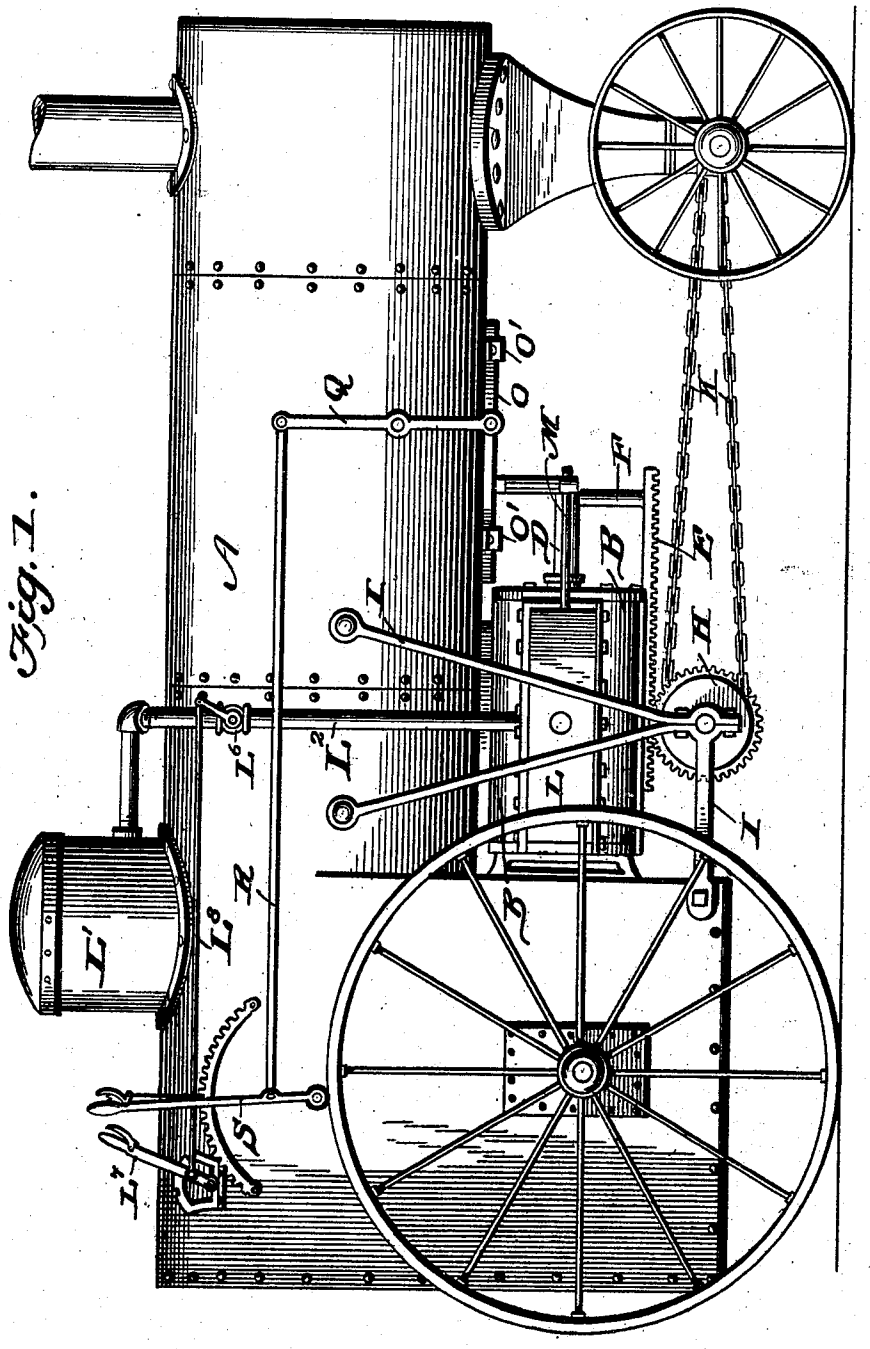
F. KOONS.

STEERING APPARATUS FOR TRACTION ENGINES.

(Application filed June 22, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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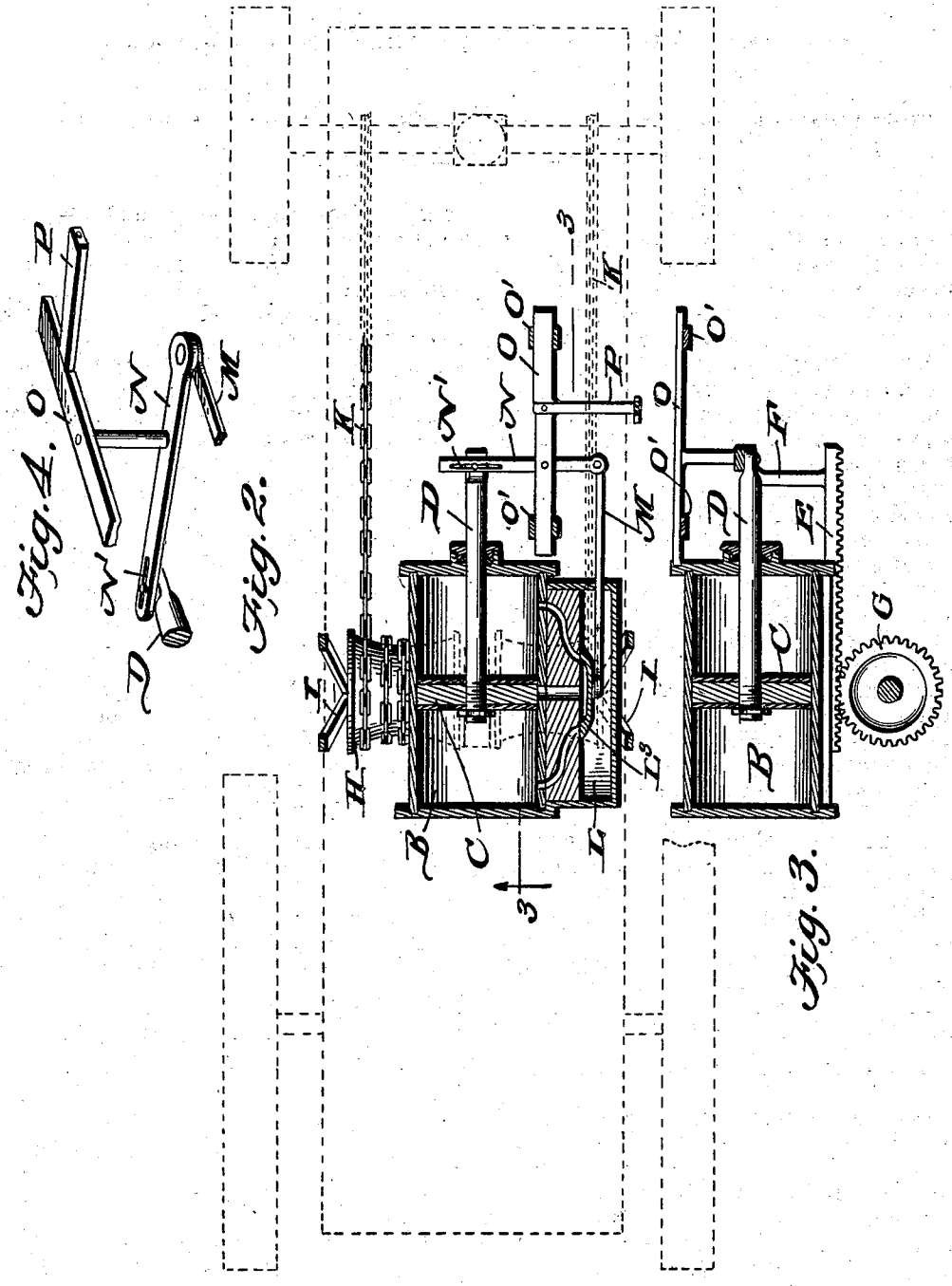
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UNITED STATES PATENT OFFICE.

FRANK KOONS, OF MOORELAND, INDIANA.

STEERING APPARATUS FOR TRACTION-ENGINES.

SPECIFICATION forming part of Letters Patent No. 695,401, dated March 11, 1902.

Application filed June 22, 1901. Serial No. 65,689. (No model.)

To all whom it may concern:

Be it known that I, FRANK KOONS, a citizen of the United States, residing at Mooreland, in the county of Henry and State of Indiana, have invented a new and useful Steering Apparatus for Traction-Engines, of which the following is a specification.

This invention is an improved steering apparatus for traction-engines, the object being to provide a simple and efficient steam mechanism by means of which the front gear of a traction-engine can be quickly and easily moved to change the direction of the engine, and another object is to provide a simple and efficient means whereby the said front gear will be quickly and automatically returned to a straight line after contacting with any obstruction tending to direct it in a different direction.

With these and other objects in view the invention consists in the peculiar construction of the various parts and their novel combination and arrangement, all of which will be fully described hereinafter, and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation of a traction-engine provided with my improvement. Fig. 2 is a horizontal sectional view of the steam appliance. Fig. 3 is a section on the line 3 3 of Fig. 2, and Fig. 4 is a detail perspective of the lever mechanism.

Referring to the drawings, A indicates an ordinary traction-engine which may be of any construction driven in any suitable manner.

B indicates a steam-cylinder arranged beneath the boiler of the traction-engine and has a piston C arranged therein, the piston-rod D projecting through the forward end of the cylinder and is rigidly connected to a rack-bar E by means of a connecting-arm F, so that when the piston moves the rack-bar moves in unison therewith, said rack-bar sliding in guideways arranged beneath the cylinder B. This rack-bar meshes with a pinion G, which is arranged intermediate the chain-spools H, said spools being supported in brackets I, secured to the traction-engine. Steering-chains K connect the drums H to the front axle of the engine, it being understood that the chains are wound in opposite directions, so that when one drum unwinds the other will take up or wind its chain thereon.

L indicates a steam-chest receiving steam from the dome L′ by means of a pipe L^2, the valve L^3 being operated by the rod M, which is connected to the piston-rod by means of an arm N, said arm having a longitudinal slot N′ in its end connected to the piston-rod. The arm N is also connected to a slide-bar O, which has a laterally-projecting arm P, connected to a lever Q, operated by the rod R, which in turn is pivotally connected with a hand-lever S. The rod O slides in suitable guides O′, arranged upon the bottom of the engine-boiler, as most clearly shown in Fig. 1.

In operation when it is desired to turn the front gear to the right or left the operating-lever S is thrown backward or forward, rocking the lever Q, which in turn operates the sliding bar O, which communicates its motion to the valve-operating rod M, thereby admitting steam to the cylinder at the proper point. The piston is then forced over forwardly or rearwardly, carrying with it the rack-bar, which meshes with the pinion and operates the chain-spools, unwinding one chain and winding the other, thereby turning the front gear as required. The steering of the engine is therefore under the direct control of the engineer. In case one of the front wheels should meet with an obstruction which would throw the front gear around one of the chains will become slack, while the other one will pull upon its spool and unwind, and in so unwinding motion is of course communicated to the rack-bar, which in turn operates upon the piston-rod, the arm N, and consequently the valve-operating rod, thereby admitting steam into the cylinder at the proper end for the purpose of returning the piston and its rod to their normal or straight positions, and thereby automatically returning the front gear to its proper or straight position, it being understood, of course, that the hand-lever is also operated through the medium of the slide-bar O and lever Q. It will thus be seen that I provide an exceedingly simple appliance for controlling the motion of the traction-engine and also for automatically correcting any variation due to obstructions.

In practice I provide the pipe L^2 with a cut-off valve, as shown at L^6, which is operated

by a hand-lever L^7 through the medium of a connecting-rod L^8, the hand-lever being located adjacent the lever S, and is therefore within easy reach of the operator.

By providing the pipe with a valve I am enabled to entirely cut off the steam from the cylinder when the machine is at rest.

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

1. A steering device for traction-engines comprising a cylinder and steam-chest, the piston and rod, the chain and spools and a rack-bar connected to the piston-rod and adapted to operate upon a pinion arranged between the spools, substantially as described.

2. In a device of the kind described, the combination with the steam-chest, cylinder, piston and rod, of the rack-bar rigidly connected to the piston-rod, the steering-chains and spools, the pinion arranged between the spools for engagement with the rack-bar, and means for regulating the passage of steam to the chest and cylinder, substantially as described.

3. In a device of the kind described, the combination with the steam-chest, cylinder, piston and rod, of the chains and spools, the rack-bar rigidly connected to the piston-rod, the pinion arranged between the spools, the valve stem or rod, and means for connecting the piston-rod and valve stem or rod, and the hand-lever with operative connections for controlling the steam-valve, substantially as described.

4. In a device of the kind described, the combination with the steam chest and cylinder, piston and rod, of the rack-bar connected to the piston-rod, the pinion arranged for engagement with said rack-bar, the steering chains and spools, the valve stem or rod, the arm connecting the said valve stem or rod and piston-rod, the slide-bar to which said arm is attached and the hand-lever and operating connections between the hand-lever and slide-bar, substantially as described.

FRANK KOONS.

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