

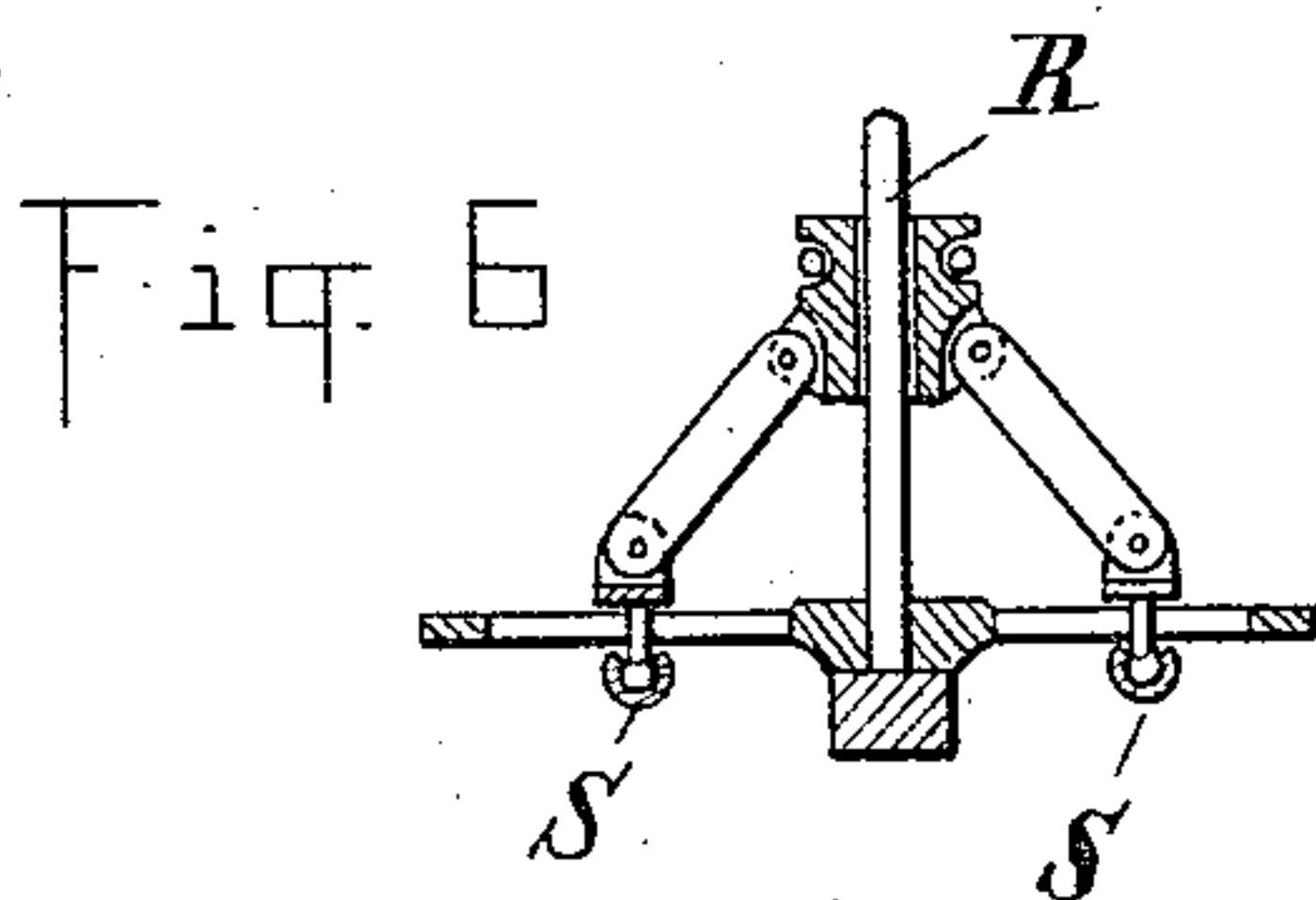
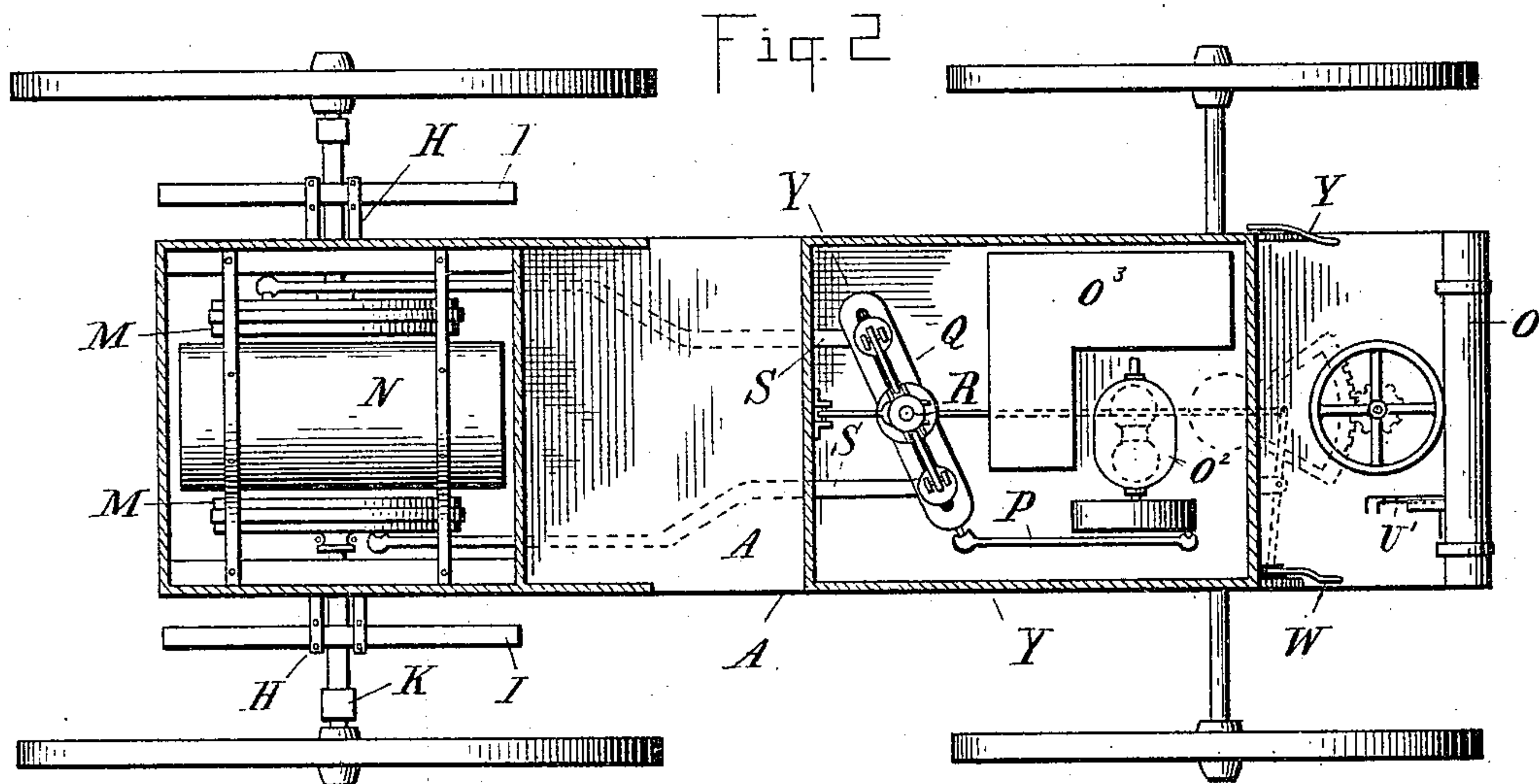
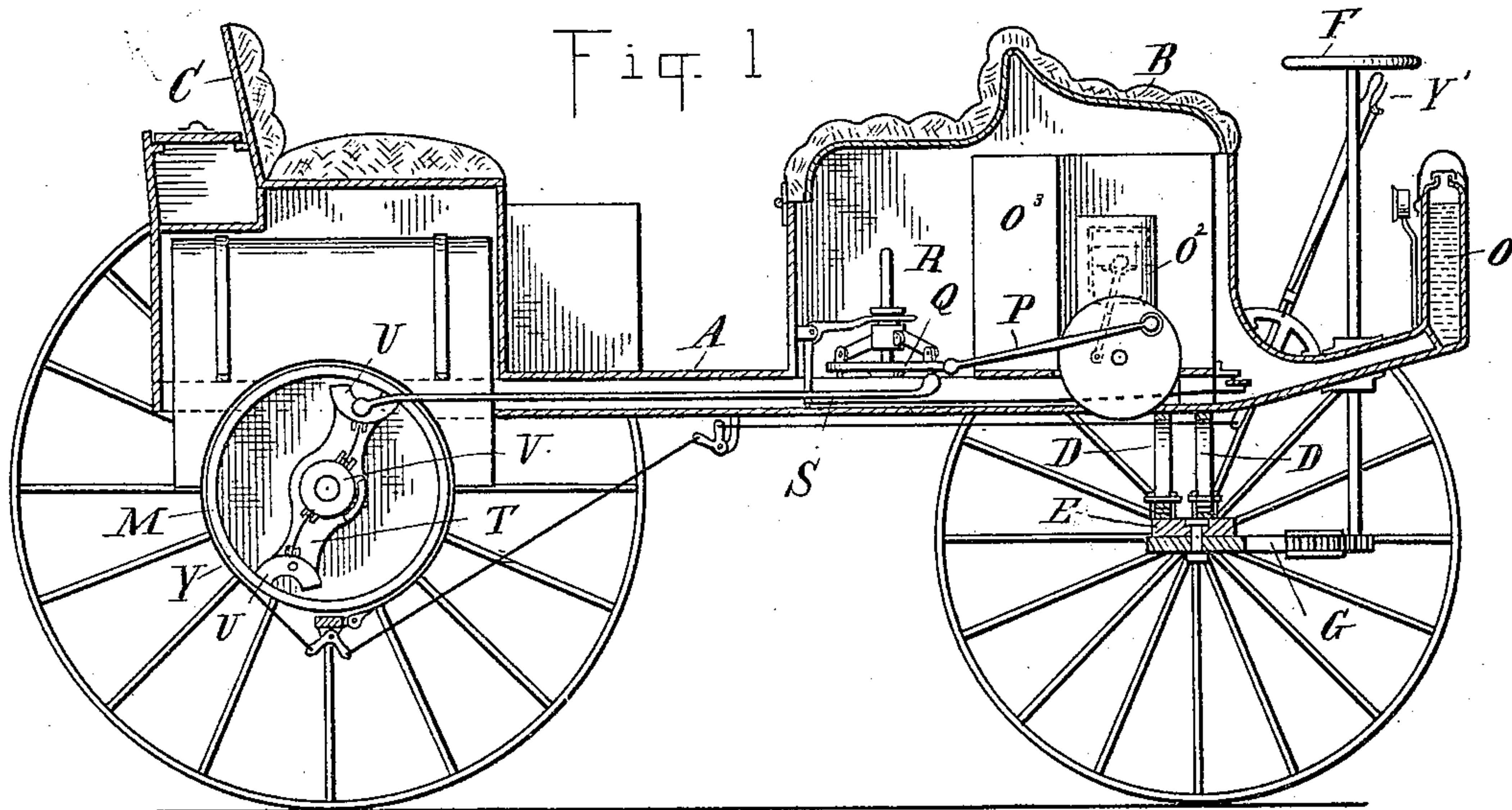
(No Model.)

2 Sheets—Sheet 1.

A. C. MARSHALL.  
STEAM ROAD VEHICLE.

No. 438,168.

Patented Oct. 14, 1890.



Witnesses:  
P. M. Hulbert  
Geo. A. Gregg.

Inventor:  
Anderson C. Marshall  
By James Whittemore  
Att'y.

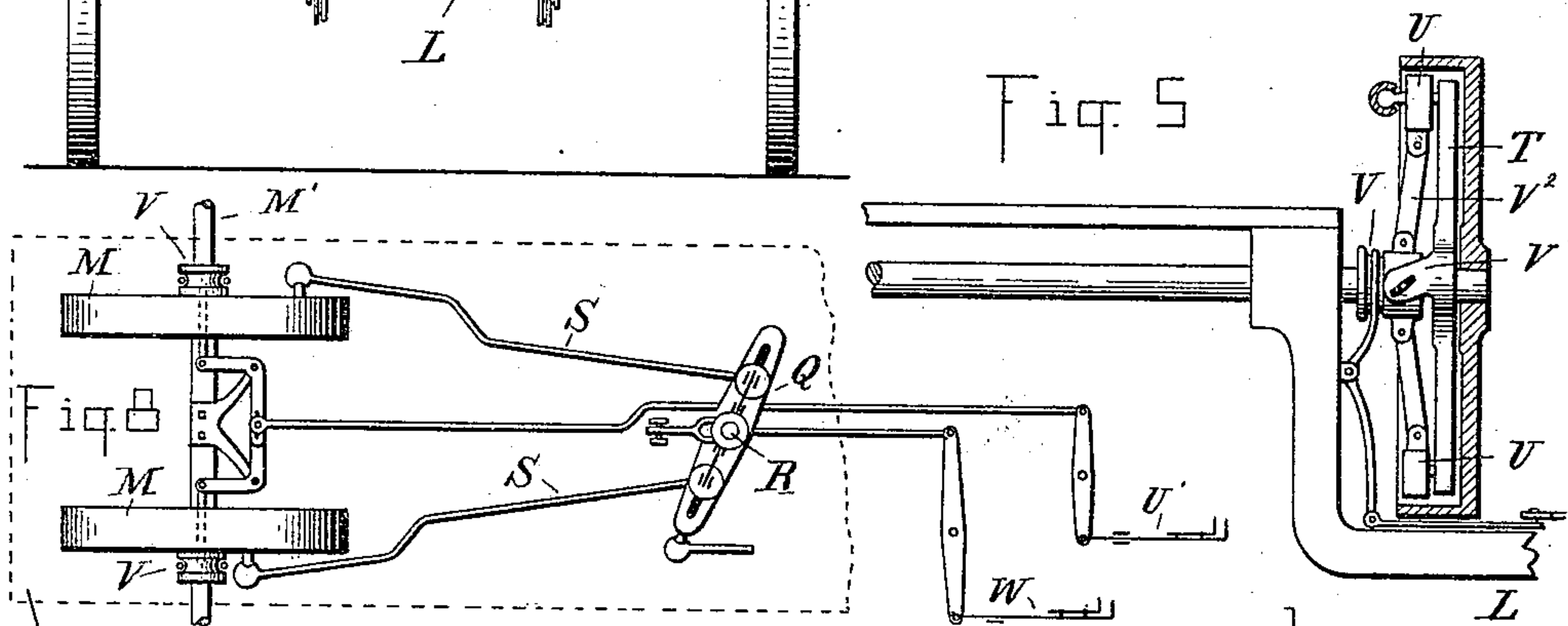
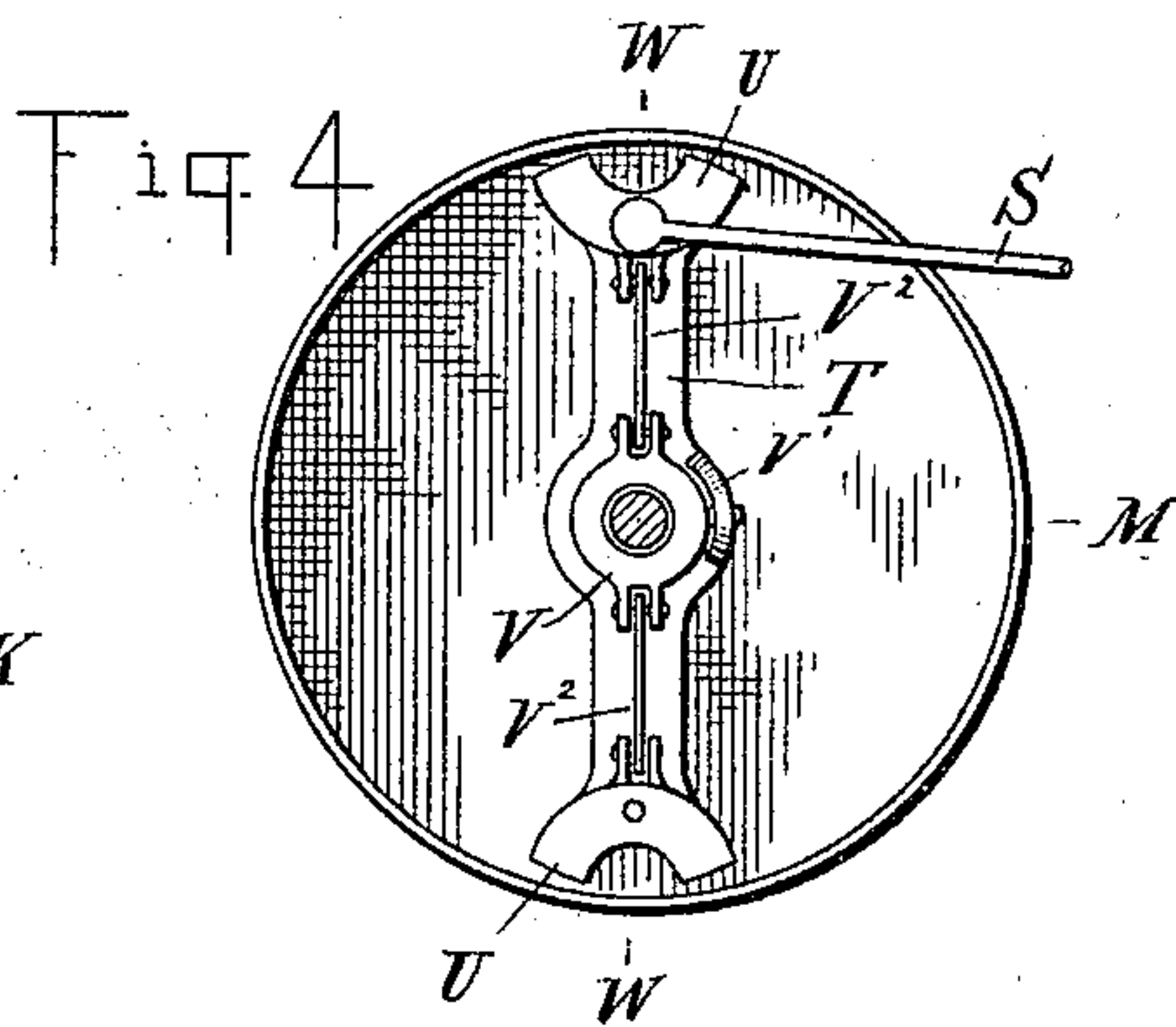
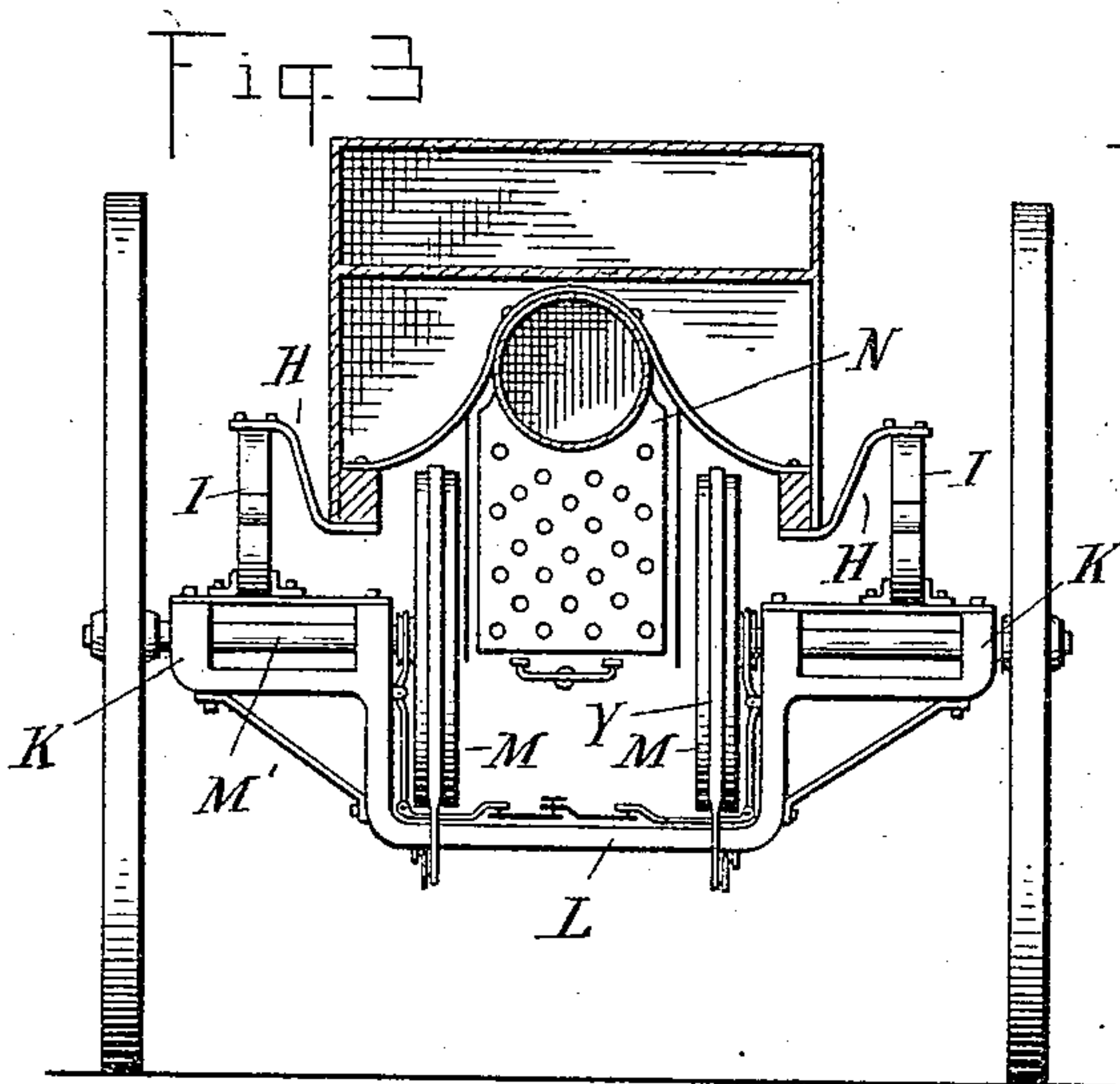
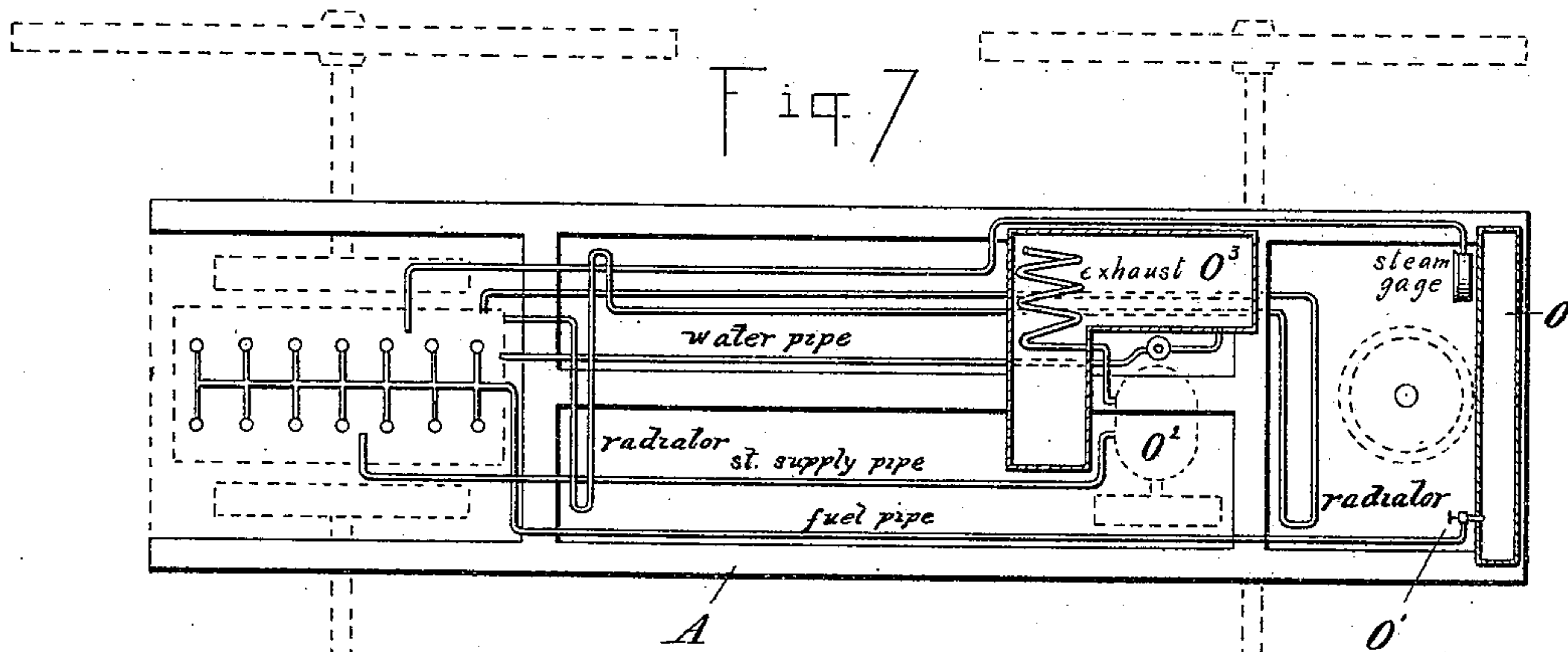
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2 Sheets—Sheet 2.

A. C. MARSHALL.  
STEAM ROAD VEHICLE.

No. 438,168.

Patented Oct. 14, 1890.



Witnesses:

*P. M. Hulbert*  
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Inventor:

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# UNITED STATES PATENT OFFICE.

ANDERSON C. MARSHALL, OF CORUNNA, MICHIGAN.

## STEAM ROAD-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 438,168, dated October 14, 1890.

Application filed December 26, 1889. Serial No. 335,078. (No model.)

*To all whom it may concern:*

Be it known that I, ANDERSON C. MARSHALL, a citizen of the United States, residing at Corunna, in the county of Shiawassee and State of Michigan, have invented certain new and useful Improvements in Steam-Vehicles, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to new and useful improvements in steam-carriages or steam road-wagons; and the invention consists, first, in the peculiar and novel arrangement of the driving-gear, which is provided with devices  
15 for controlling, independent of the engine or motor, the speed, stopping, advancing, and reversing; second, in the peculiar arrangement and construction of the engine and boiler; third, the peculiar arrangement and  
20 construction of the brake mechanism; fourth, in the construction, arrangement, and combination of the various parts, all as more fully hereinafter described, and shown in the drawings, in which—

25 Figure 1 is a longitudinal vertical section through a road-wagon embodying my invention. Fig. 2 is a plan thereof, with the seats of the wagon removed. Fig. 3 is a rear elevation, partly in section. Fig. 4 is a detail  
30 elevation of the reversible friction-clutch in the driving-gear. Fig. 5 is a section on line *w w* in Fig. 4. Fig. 6 is a cross-section on line *y y* on Fig. 2. Fig. 7 is a plan showing the distribution and location of the steam,  
35 water, and liquid-fuel pipes. Fig. 8 is a plan of the actuating-connections of the reversible friction-clutch.

40 A is a platform or wagon-body supported upon front and rear wheels or trucks, and provided with convenient facilities for carrying passengers, substantially as shown in the drawings, where B are front seats, and C the hind seat. The platform is constructed hollow, forming a space to conceal and protect  
45 the driving mechanism, as more fully hereinafter described. The front part of the platform is supported by means of a pair of cross-springs D, which are secured upon the fifth-wheel E upon the front axle, on which the  
50 front wheels loosely revolve. This front axle is provided with a steering-gear actuated by a steering-wheel F in front in proximity to

the driver, and operated through its vertical staff, which passes loosely through guide-bearings, and is provided with a pinion on its lower end engaging into the segmental gear G, secured to the front side of the axle. The rear end of the platform is supported by means of the hangers H upon the springs I, which in turn are supported near the outer ends of the yoke L. There are two stub-axes M' in line with each other, one for each wheel, and each provided with independent driving mechanism. The two stub-axes are journaled in bearings K, formed upon the outer ends of the yoke L, which has a central depression or drop below the drive-wheels M, which are secured upon the inner ends of the stub-axes M'.

N is a steam-generator of suitable description, supported from the under side of the platform in the well between the two drive-wheels M. This generator is well protected against loss of heat on the outside, and smokeless fuel is employed for generating steam, to which end I provide a tank for gasoline or like liquid fuel concealed in the dash-board, and from there I conduct a pipe between the floors of the platform to supply the burners of the generator. This pipe I control by a regulating-valve *o'*, accessible to the driver from his seat and adapted to regulate the size of the flames or extinguish the same, so as to furnish a perfect control over the generator. I also preferably provide the burner with automatic lighting devices, also under control of the driver, which may be of any suitable description, as now in use.

The engine O<sup>2</sup> is preferably under the front seat below the driver, and is of a compact style, which permits of economizing a suitable space in front to carry a water-tank o<sup>3</sup>, of relatively large capacity, which thus protects the driver from the effects of the heat, and the radiation from the engine prevents the freezing of the water. The exhaust from the engine may also discharge into the water-tank.

60 Motion is carried through a crank on the main shaft to the pitman P, which has ball-and-socket connections at both ends for perfect adjustability, and thence to the horizontally-vibrating lever Q, which is supported upon a pivot-pin R between the floors of the platform. To this vibrating lever are adjustably secured at opposite ends the connect-



ing-rods S S, which project rearwardly between the floors of the platform and connect by a ball-and-socket joint to the vibrating levers T, which are sleeved loosely upon the  
 5 respective inner ends of the stub-axles within the drive-wheels M. To each end of the vibrating arms is pivotally secured a friction-block U, which is adapted to make frictional contact with the inner face on the rim of the  
 10 drive-wheel M in either direction or be thrown out of gear with said flange, according to the adjustment provided, and which consists of a lever U', arranged in proximity to the driver, with intermediate connection, as shown in  
 15 Fig. 8, to a sliding sleeve V, which engages with a spiral guide V' the lever T, and is adapted through the connections V<sup>2</sup> to rock the friction-blocks to either side or to hold them in their central position out of contact  
 20 with the friction-wheels, whereby the motion communicated to the blocks U through the connecting-rods is frictionally transmitted either by the push or by the pull of said rods, thus forming the means for going ahead,  
 25 backing, or stopping, according to the adjustment of the lever without interfering with the motion of the engine.

To regulate the speed independent of the engine, the driver is provided with a lever W,  
 30 which, through intermediate connections, as shown, connects to the ends of the connecting-rods S for the purpose of increasing or decreasing their leverage in like proportion by sliding them from or toward the pivot R of  
 35 the vibrating arm. A suitable brake mechanism is also provided—such as the brake-straps Y, applied to the driver-wheels M and controlled through suitable mechanism by a lever Y' in proximity to the driver on his seat.

40 For the comfort of the passengers I provide radiators or foot-warmers, which are supplied with steam from the boiler or the exhaust-steam from the engine, thus making suitable provision for the convenience of the passen-  
 45 gers in cold weather.

The points of my invention to which I wish to call particular attention are—

First, no control of the engine is required, and therefore I am enabled to fully protect  
 50 and conceal it, so that it will not inconvenience the passengers. At the same time perfect control of the driving mechanism is obtained through the various levers which govern, first, the gear in such a manner as to stop,  
 55 start, and reverse the wheels; second, the speed-regulating mechanism, which allows an increase in power in mounting hills or an increase in speed on the level road; third, the brake mechanism, which is made sufficiently  
 60 powerful to hold the device even against the power of the engine.

Second, the usual inconvenience arising from the use of coal or wood is entirely done away with by using liquid fuel, the safety of  
 65 which is guaranteed by the distance maintained between the supply-tank on the front end of the wagon and the generator placed at

the rearmost end thereof and by the regulating-valve in the supply-pipe.

I further intend to enable the driver to in- 70 form himself as to the condition of the flames and generator without descending from his seat by providing reflectors or mirrors within the vision of the driver, and suitable indicators and steam-gages observable by him with- 75 out changing his position.

As in vehicles of this kind success depends entirely upon their safety and convenience and upon the appearance, which, if in any way unusual, detracts from the merit for ob- 80 vious reasons, it will be seen that I have without question succeeded in hiding and protecting the whole driving mechanism, with its motor and paraphernalia, to such an extent that no unusual appearance is given to frighten 85 horses or deter timid people from making use of the contrivance. Smoke and noise are done away with and the work of attendance is reduced to a minimum.

I preferably hinge the front seat so that it 90 may be turned back, if desired, to examine the working parts, as the space under the seat is inclosed all around to keep out the dust and prevent the freezing of the water in the tank. 95

Other appliances not specially mentioned, but forming a necessary part or a usual appendix of steam-vehicles—such as a feed-pump, exhaust-pipe, whistle, &c.—may be arranged as deemed best. 100

What I claim as my invention is—

1. In a vehicle of the kind described, the combination, with the platform, of a liquid-fuel reservoir concealed within the dash-board, an engine and water-tank connected below a 105 seat on the front end of the platform, the generator supported below a seat on the rear end of the platform, and the driving mechanism concealed within the hollow floor of the platform, substantially as described. 110

2. In a vehicle of the kind described, the combination of the following elements: the hind wheels secured to independent stub-axles, the driving mechanism applied thereto, the reversible friction-clutches and their con- 115 trolling-lever, the speed-regulating mechanism and its controlling-lever, and the brake mechanism and its controlling-lever, all said levers arranged in proximity to the driver, substantially as described. 120

3. In a vehicle of the kind described, the combination of the following elements: the body of the vehicle carrying front and rear seats and the hollow platform, the engine and water-tank concealed under the front 125 seats, the generator supported under the rear seat, and the intermediate driving-gear concealed within the hollow platform, substantially as described.

4. In a vehicle of the kind described, the 130 combination, with the body, the rear supporting-wheels secured upon independent stub-axles, the drive-wheels M, secured thereto, and the connecting-yoke in which the axles are



journaled and on which the body is supported, substantially as described.

5 5. In a vehicle of the kind described, a speed-regulating mechanism consisting of the vibrating arm Q, the connecting-rods S, adjustably secured thereto, and the adjusting-lever with its connection for adjusting them from or toward the pivot, substantially as described.

10 6. In a vehicle of the kind described, a reversing mechanism comprising the lever U', with its intermediate connections, and the drive-wheels M, provided with vibrating levers T and the reversible friction-blocks U, substantially as described.

15 7. In a steam-vehicle, the combination, with the hind wheels secured upon the independent stub-axles, of a friction drive-gear consisting of the drive-wheels M, secured to said axles, respectively, vibrating levers T, sleeved upon said axles—one for each drive-wheel—reversible friction-blocks U, secured to the ends of said levers and adapted to make frictional contact with the inner face of the rim  
20 of the drive-wheel, and a lever-controlled mechanism for said friction-blocks to throw them in or out of gear in either direction, substantially as described.

30 8. In a steam-vehicle, the combination, with the hind wheels secured upon independent stub-axles, of a friction drive-gear consisting of the drive-wheels M, secured to said axles, respectively, vibrating levers T, sleeved upon said axles—one for each drive-wheel—friction-blocks pivotally secured to the ends of  
35 said levers, a vibrating lever Q, actuated by the motive power, and connecting-rods S, attached at one end to the opposite arms of the lever Q and at the other to the vibrating levers T, respectively, substantially as described.

9. In a steam-vehicle, the combination, with the hind wheels secured upon independent stub-axles, the drive-wheels M, secured to said axles, respectively, the vibrating levers T, carrying the reversible friction-blocks U, adapted to engage upon the inner face of the flanges of the drive-wheels, and the brake-straps Y, adapted to engage upon the outer face of the drive-wheels, substantially as described.

10. In a steam-vehicle, the combination of the hollow platform, the steam-generator supported near the rear end of said platform, the rear seat inclosing said generator on top and sides, the liquid-fuel burners, the liquid-fuel-supply pipe concealed in the hollow platform, the liquid-fuel reservoir forming the dashboard, and the regulating supply-valve in proximity to the driver, substantially as described.

11. The combination of the drive-wheel M, secured upon the stub-axle, the vibrating lever T, fulcrumed upon the said stub-axle, the reversible friction-blocks U, secured to the arms of said lever and adapted to be thrown in and out of contact with the inner face of the flanges of said wheel, the sliding sleeve V and spring-bars V<sup>2</sup>, pivotally connecting the sliding sleeve with the friction-block, the spiral-guide connection between the sliding sleeve and the vibrating lever T, and the lever U', with its actuated connection with said sliding sleeve, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 29th day of October, 1889.

ANDERSON C. MARSHALL.

Witnesses:

S. M. HULBERT,  
C. C. ALTON.