No. 774,771. PATENTED NOV. 15, 1904.

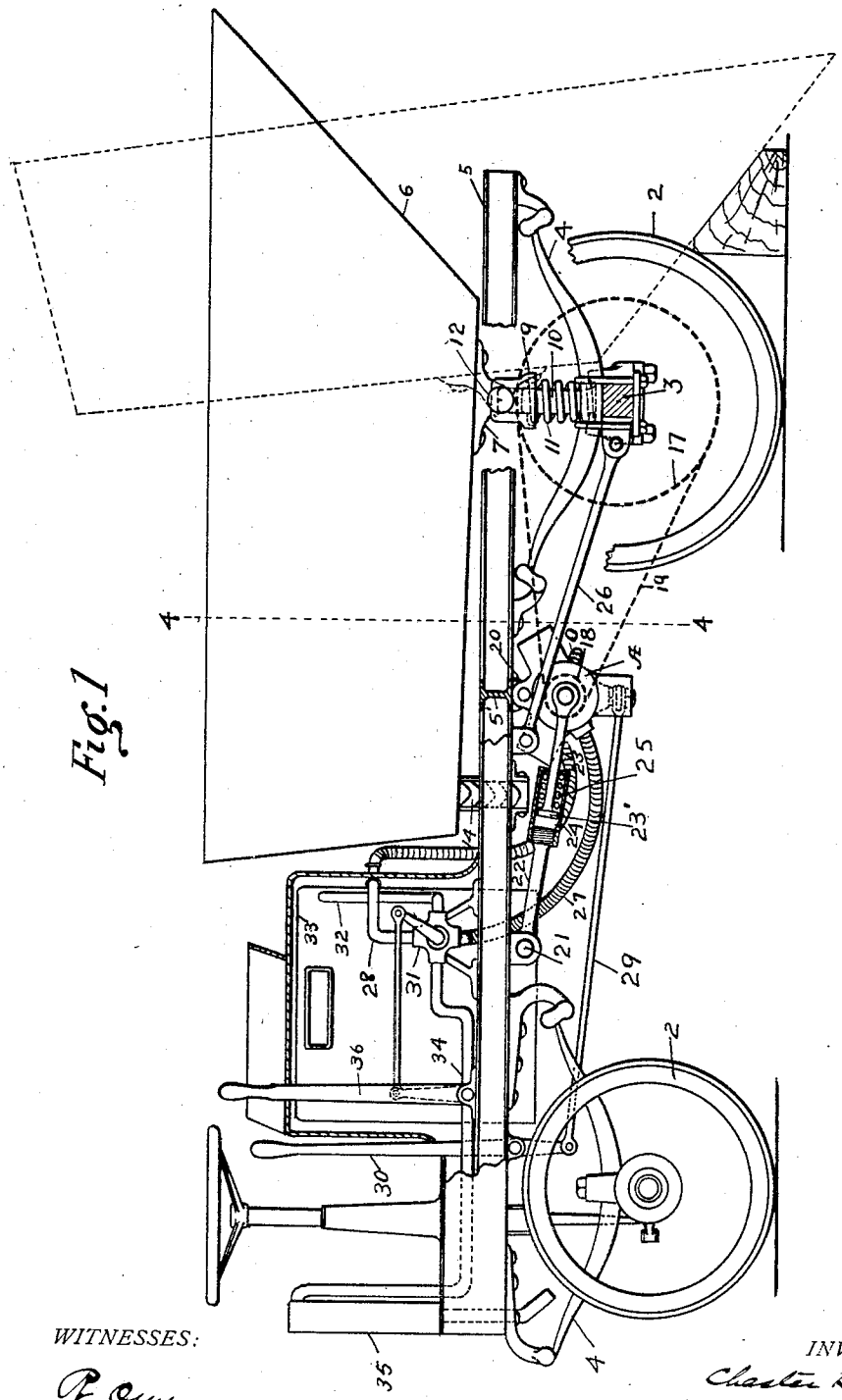
C. B. MILLS & A. WILLIAMS.

SELF PROPELLED VEHICLE.

APPLICATION FILED JUNE 20, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1



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No. 774,771. PATENTED NOV. 15, 1904.

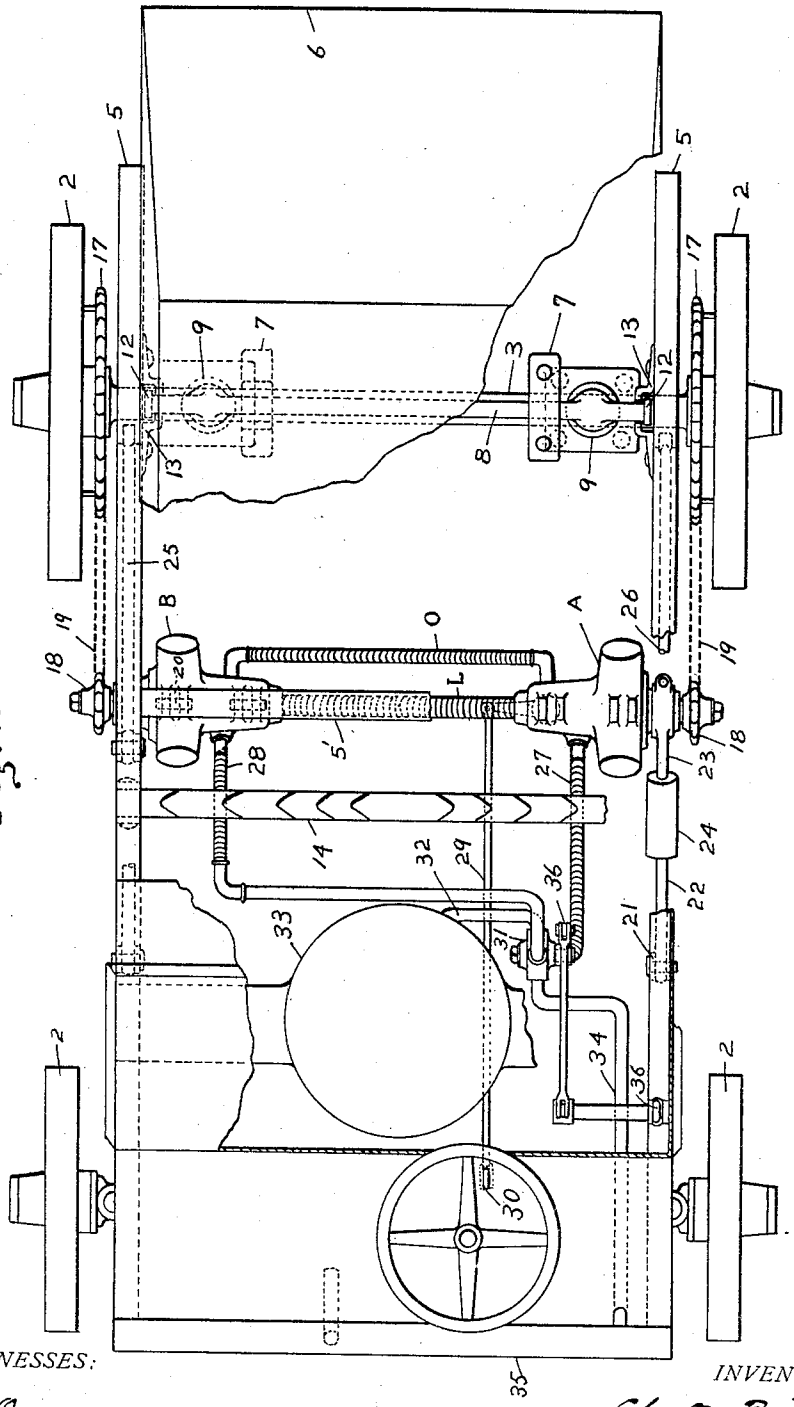
C. B. MILLS & A. WILLIAMS.

SELF PROPELLED VEHICLE.

APPLICATION FILED JUNE 20, 1903.

NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2



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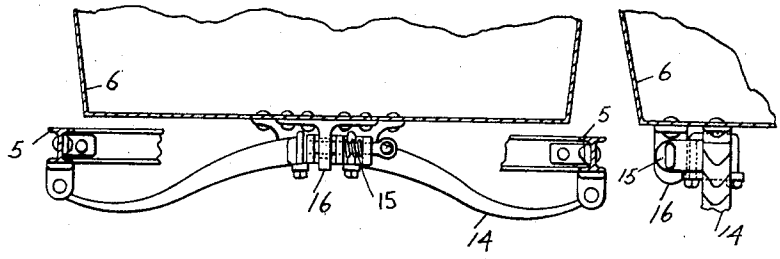
C. B. MILLS & A. WILLIAMS.

SELF PROPELLED VEHICLE.

APPLICATION FILED JUNE 20, 1903.

NO MODEL. 4 SHEETS—SHEET 3.

Fig. 3



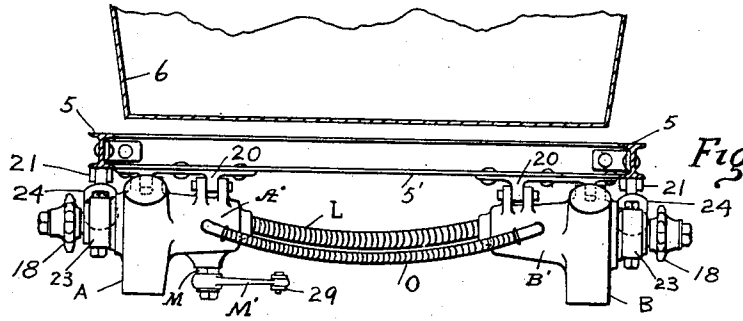
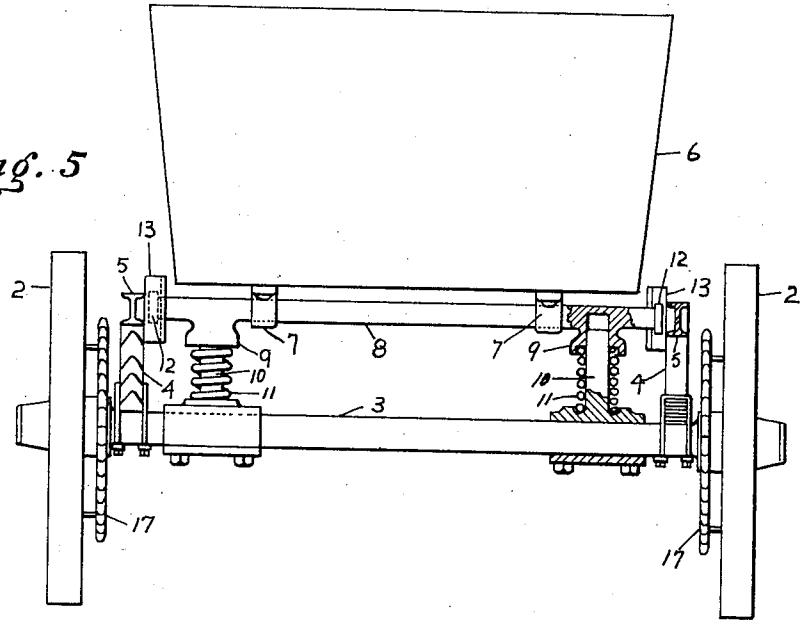


Fig. 4

Fig. 5



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No. 774,771. PATENTED NOV. 15, 1904.

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SELF PROPELLED VEHICLE.

APPLICATION FILED JUNE 20, 1903.

NO MODEL. 4 SHEETS—SHEET 4.

Fig. 7

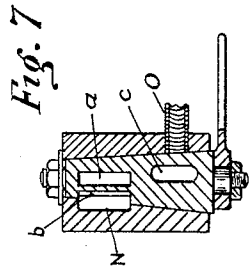


Fig. 8

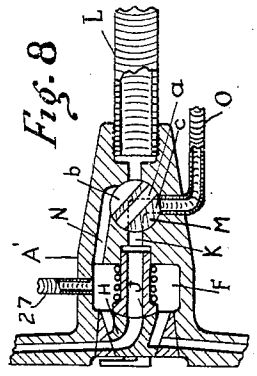
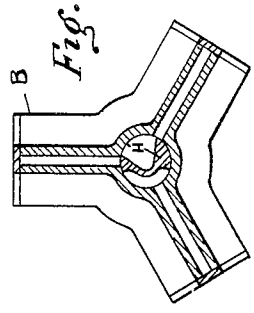


Fig. 9



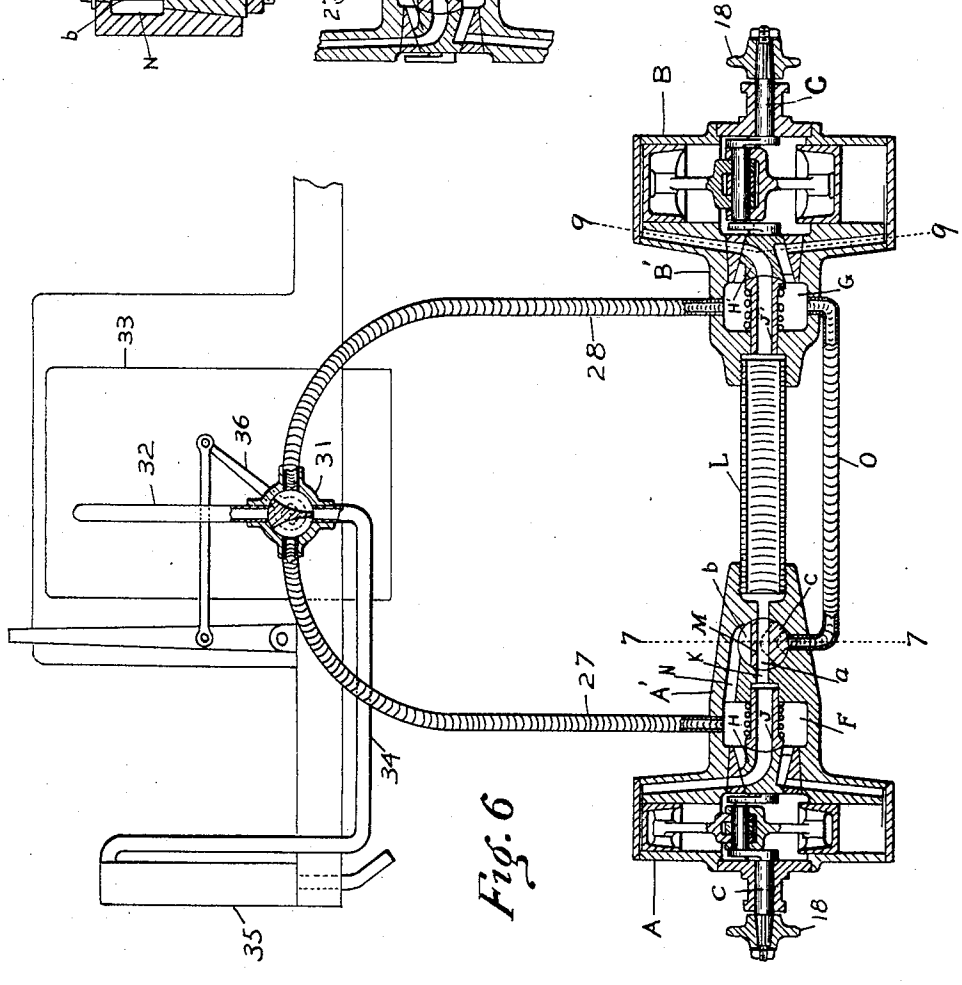


Fig. 6

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No. 774,771. Patented November 15, 1904.

UNITED STATES PATENT OFFICE.

CHESTER B. MILLS, OF WILKINSBURG, AND ANTHONY WILLIAMS, OF PITTSBURG, PENNSYLVANIA.

SELF-PROPELLED VEHICLE.

SPECIFICATION forming part of Letters Patent No. 774,771, dated November 15, 1904.

Application filed June 20, 1903. Serial No. 162,373. (No model.)

To all whom it may concern:

Be it known that we, CHESTER B. MILLS, residing at Wilkinsburg, and ANTHONY WILLIAMS, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Self-Propelled Vehicles, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has particular reference to self-propelled vehicles used for heavy hauling—such as drays, dump-wagons, &c.; and one object is to provide the motor mechanism with a spring mounting distinct from the vehicle-body mounting and sufficiently sensitive to obviate the necessity for cushion-tires.

Another object is to provide an improved mounting for the vehicle-body.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a dumping-vehicle embodying our invention, the body being shown tipped in dotted lines. Fig. 2 is a top plan view with portions of the mechanism broken away. Fig. 3 is a detail view illustrating the balancing connection between the body and spring-frame. Fig. 4 is a cross-sectional view on line 4 4 of Fig. 1. Fig. 5 is a rear end elevation. Fig. 6 is a diagrammatic view showing the motors in section and the fluid inlet and exhaust mechanisms. Fig. 7 is a sectional view of the valve on line 7 7 of Fig. 6. Fig. 8 is a detail view of the valve in a different position from that shown in Fig. 6. Fig. 9 is a sectional view of the motor on line 9 9 of Fig. 6.

Referring to the drawings, 2 represents the ground-wheels, and 3 the axles.

4 represents springs on the axles supporting the frame which carries the motive apparatus. In the disclosed embodiment of the invention said frame consists, in part, of parallel side bars 5, unconnected at their rear ends to provide space therebetween for dumping-body 6, which is hinged at 7 on supporting-bar 8. Sockets 9 on this bar fit over posts 10 on the rear axle with heavy springs 11 thereunder, thus providing a spring-support for the body separate from the main frame of the vehicle. Heads 12 at the ends of support 8 fit vertical guides 13 on frame-bars 5, thus holding the frame and body in proper horizontal relation without interfering with their independent vertical play on their respective springs. To balance the body, its forward end rests on spring 14, secured to bars 5, with a spring-catch 15 on the spring-engaging eye 16 on the body to secure the same.

Body 6 is of the type commonly used for hauling garbage or refuse; but other forms may be used. The invention is not restricted to a tipping body nor to the disclosed means for mounting the same.

Separate motors A and B are arranged at opposite sides of the vehicles for driving the rear ground-wheels 2, the gearing for each side consisting of sprockets 17 and 18, secured, respectively, to wheel 2 and motor-shaft C and drive-chain 19. The motors are adjustable with relation to sprockets 17 to maintain the drive-chains tightly stretched, the motor-mountings here shown consisting of the hinged hangings 20 on the under side of transverse frame-bar 5′. For exerting a constant pull on the hinge-mounted motors the outer bearing of each is connected to a tensioning device hinged at 21 to bar 5 and consisting of rods 22 and 23, the former carrying the adjustable case or barrel 24, in which is adjustably held the headed end 23, of rod 23 by means of coiled spring 25, thereby exerting constant pull on the motor in direction away from the ground-wheels. By adjusting case 24 on rod 22 the length of the tension device may be varied. Braces 26 from the rear axle to bars 5 maintain said parts in proper relative position.

The motors are preferably of the type shown and described in our Patent No. 726,967, May 5, 1903. The motor-casings are extended on the inner sides at A′ B′, respectively, and in the former is chamber F, to which is connected flexible steam-inlet pipe 27, while in extension B′ is chamber G, from which extends flexible exhaust 28. The motor-valves H H′ are held to their seats by and communicate with the spring-held tubular bearings J J′, extending through chambers F and G, the bearing J communicating with passage K in

extension A′, and said passage is connected by flexible tube L with motor extension B′ and communicates directly with tubular bearing J′. As the motors are adapted to either receive steam or exhaust through the valves, as described in our former patent, the arrangement is such in the present instance that motor A exhausts through bearing J, while motor B receives the motive fluid through bearing J′, the former receiving steam from chamber F and motor B exhausting into chamber G. With motor A exhausting into motor B the steam is compounded, motor A being high pressure and motor B low pressure.

To provide for operating both motors at high pressure, as with excessive loads or on grades, a plug-valve M is arranged in passage K and formed with three ports *a*, *b*, and *c*. Passage N extends from chamber F to the seat of this valve, and from the opposite side of the seat extends flexible pipe O to chamber G of motor B. In the position shown in Fig. 6 port *a* is in line with bearing J and tube L, with passages N and tube O closed, so that motor A exhausts into motor B, as when compounding.

To pass live steam to the motors to operate both at high pressure, valve M is turned to position shown in Fig. 8, placing port *a* out of register with bearing J and tube L and opening passage N to said tube through port *b*, and the same adjustment places port *c* in register with bearing J and tube O. Hence live steam passes to motor A, as before, and also to motor B through tube L, while the exhaust from motor A is diverted into tube O and conducted to chamber G, where it joins the exhaust from motor B. Valve M may be conveniently operated by rod 29, extending from crank M′ on the stem thereof to lever 30, suitably mounted in the forward portion of the vehicle within reach of the operator.

The flexible inlet and exhaust pipes 27 and 28 unite with throttle-valve 31, similar in construction and operation to valve 41 of our former patent, said valve being connected by pipe 32 to a suitable steam-generator 33, while exhaust-pipe 34 extends from said valve to a suitable condenser 35. The throttle-valve is manipulated by an operating-lever 36. As in our former patent, the movement of the vehicle may be reversed by reversing the position of valve 31, thereby reversing the operation of the motors and also the manner in which each receives and exhausts the steam.

While the motive mechanism and mounting therefor are shown in connection with a heavy-draft dumping-vehicle, it will be understood that the same may be used in various types of vehicles of both light and heavy construction without departing from the spirit of the invention.

For drays, &c., designed for heavy hauling the separate spring-frame for the motive mechanism provides for sufficiently cushioning the same without the need of pneumatic or other resilient tires, the use of which is impracticable for vehicles of this type. Said frame is relieved of the heavy jolting and jarring communicated to the more solidly-mounted body.

We claim—

1. In an improved vehicle, running-gear, a frame and a body separately mounted thereon, separate springs for the frame and body, and a vertically-sliding connection between the frame and body.

2. In an improved vehicle, running-gear, a spring-mounted frame on the running-gear, motor mechanism on the frame, a body having a mounting on the running-gear separate and distinct from said frame, and a vertically-sliding connection between the frame and body.

3. In a motor-propelled vehicle, running-gear, a spring-mounted frame on the axles thereof, a body having a mounting on the rear axle separate and distinct from the said frame, vertically-disposed guideways 13 on the frame, and projections 12 on the body extending into the guideways.

4. In a self-propelled vehicle, axles, a frame mounted on the axles, motor mechanism on the frame, posts projecting upward from the rear axle, a body-support embracing and movable vertically on the posts, springs for the support, and a body.

5. In a self-propelled vehicle, axles, a frame mounted on the axles, motor mechanism on the frame, posts projecting upward from the rear axle, a body-support formed with sockets for loosely embracing the posts, coiled springs on the posts beneath the support-sockets, and a body.

6. In a self-propelled vehicle, axles, a frame mounted thereon, motor mechanism on the frame, posts projecting upward from the rear axle, a spring-mounted body-support movable vertically on the posts and vertically-sliding connection between the support and said frame, and a body.

7. In a self-propelled vehicle, axles, a spring-frame mounted thereon, a support mounted on the rear axle independently of the frame, a body having a tipping mounting on the support, and motor mechanism on the frame.

8. In a self-propelled vehicle, axles, a spring-frame mounted thereon, a tipping body supported by the rear axle independently of the frame, a balancing connection between the forward end of the body and spring-frame, and motor mechanism on said frame.

In testimony whereof we affix our signatures in presence of two witnesses.

CHESTER B. MILLS.
ANTHONY WILLIAMS.

Witnesses:
JAS. S. WELDON,
J. M. NESBIT.