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# G. DAIMLER.

## ENGINE DRIVEN VEHICLE.

No. 376,638. Patented Jan. 17, 1888.

Fig. 1.

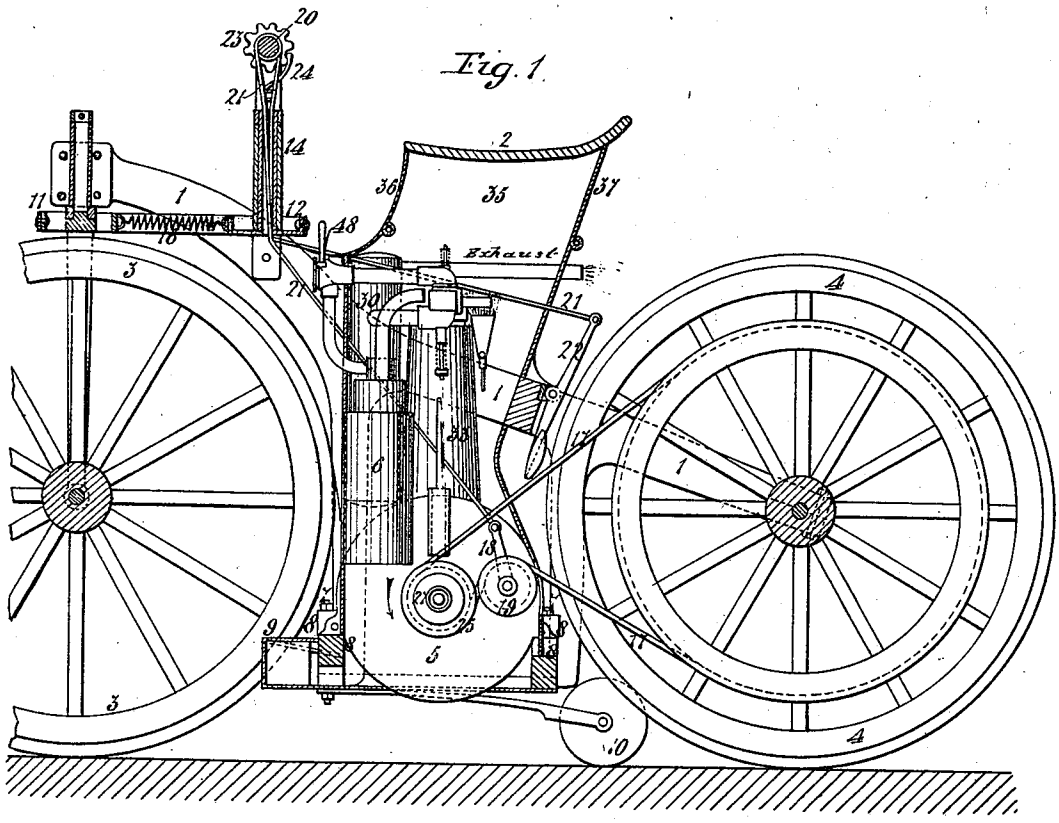
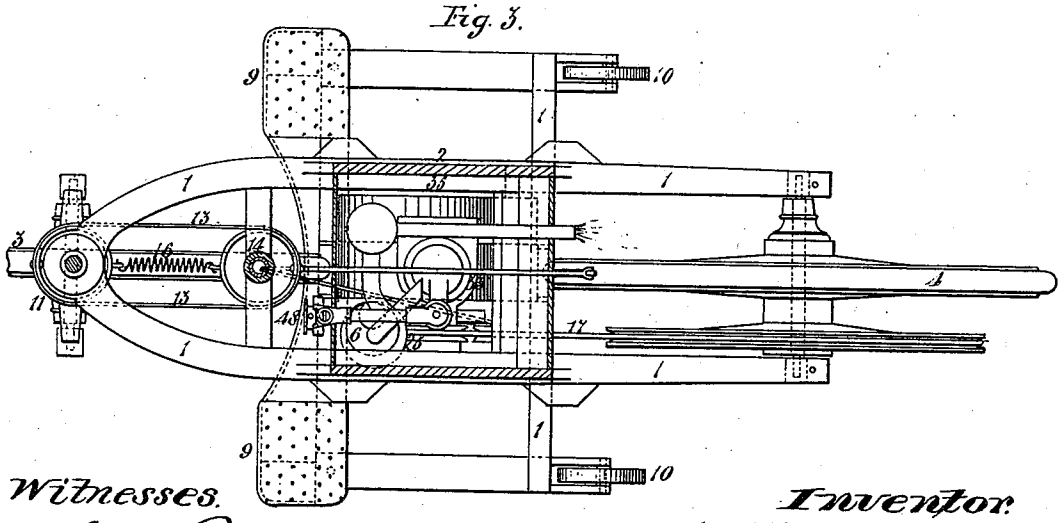



Fig. 3.



Witnesses.
J. A. Rutherford
Albert Everett

Inventor.
Gottlieb Daimler.
By James L. Norris.
Atty.

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# G. DAIMLER.

## ENGINE DRIVEN VEHICLE.

No. 376,638. Patented Jan. 17, 1888.

*Fig. 2.*

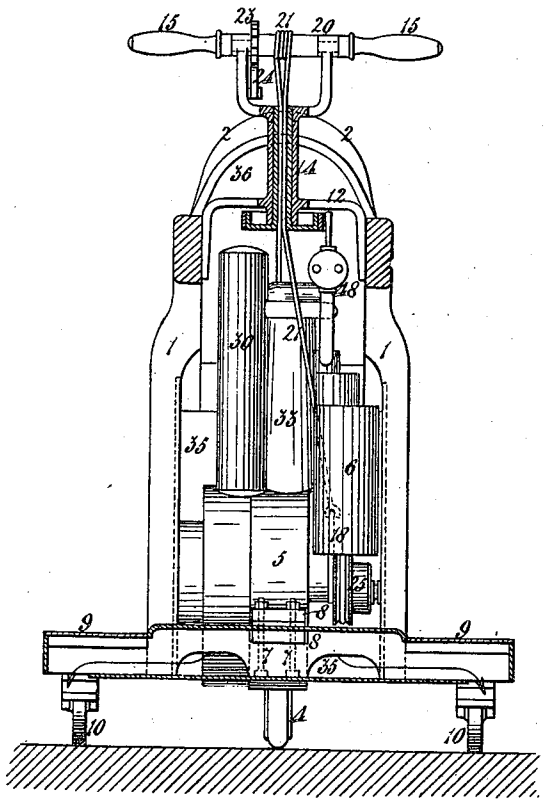
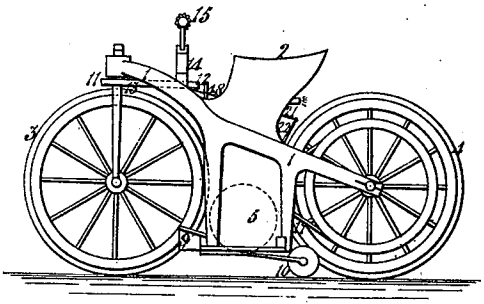



*Fig. 4.*




Witnesses.
J. A. Rutherford
Robert Arnott

Inventor.
Gottlieb Daimler.
By James L. Norris.
Atty.

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# G. DAIMLER.

## ENGINE DRIVEN VEHICLE.

No. 376,638. Patented Jan. 17, 1888.

Fig. 6.

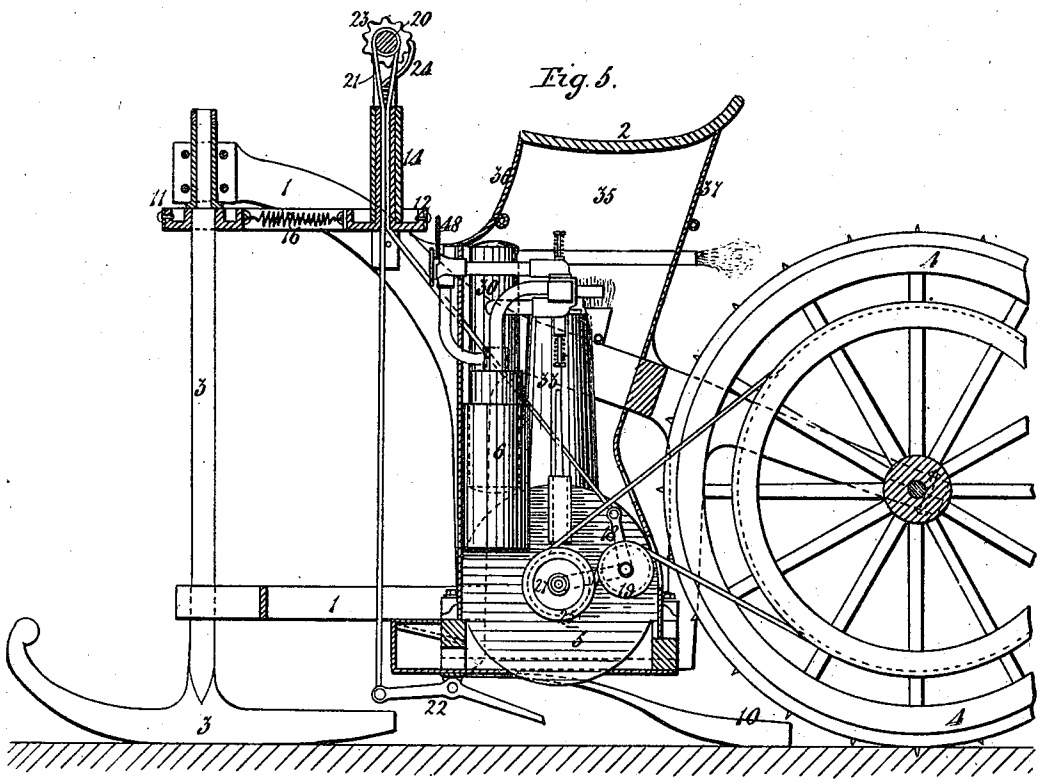
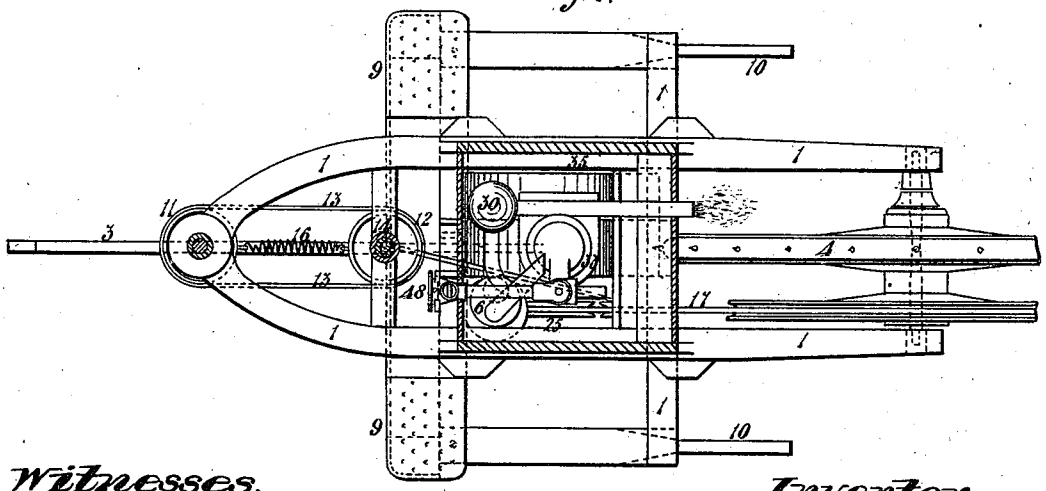



Fig. 7.




Witnesses.

J. A. Rutherford

Robert Everett.

Inventor.

Gottlieb Daimler.

By James L. Norris.

Atty.

(No Model.) 5 Sheets—Sheet 4.

# G. DAIMLER.

## ENGINE DRIVEN VEHICLE.

No. 376,638. Patented Jan. 17, 1888.

*Fig. 6.*

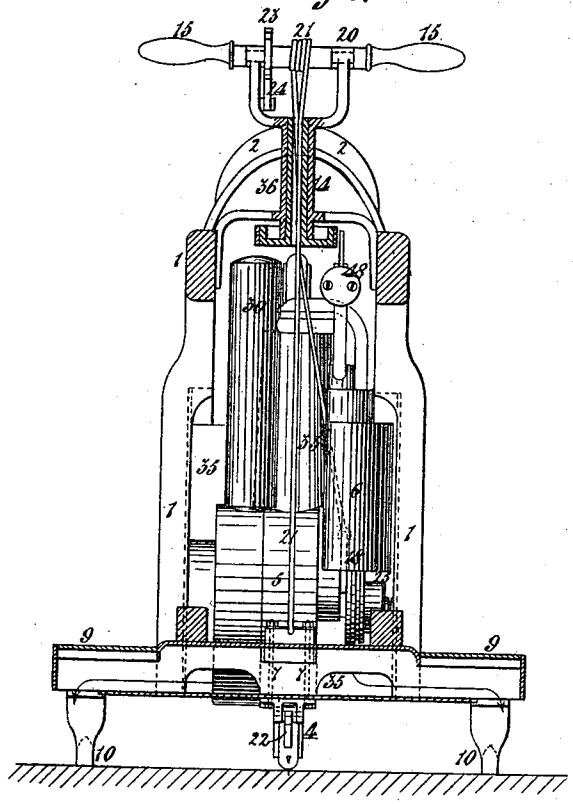
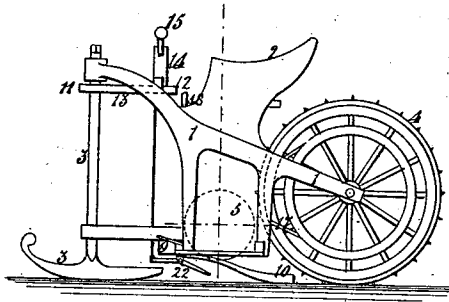



*Fig. 8.*




Witnesses.
J. A. Rutherford
Robert Everett

Inventor.
Gottlieb Daimler.
By James L. Norris.
Atty.

(No Model.) 5 Sheets—Sheet 5.

# G. DAIMLER.

## ENGINE DRIVEN VEHICLE.

No. 376,638. Patented Jan. 17, 1888.

Fig. 11.

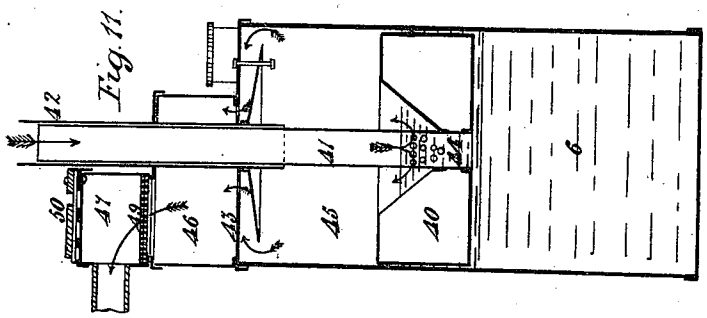



Fig. 12.

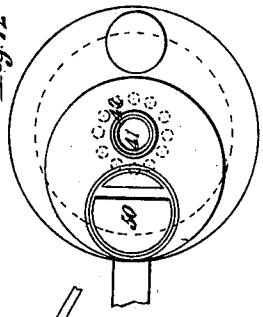



Fig. 10.

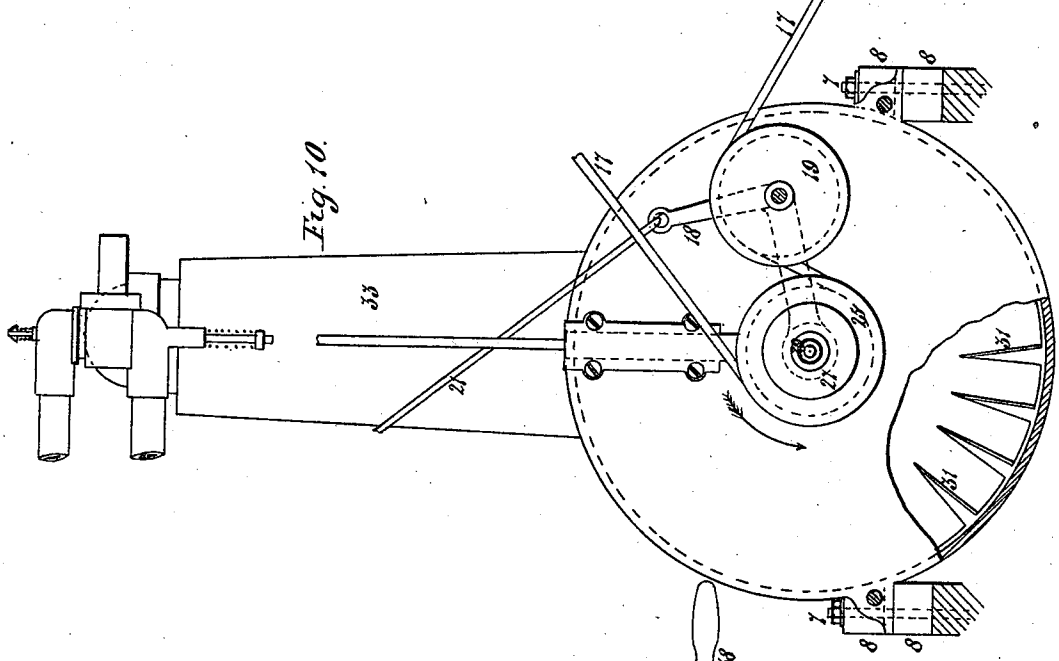
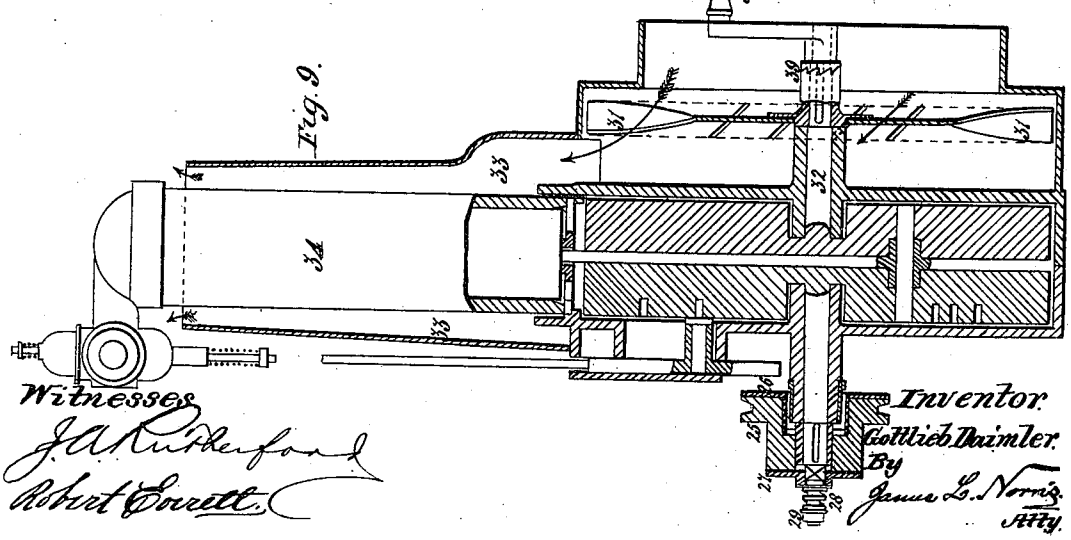



Fig. 9.




Witnesses
J. A. Rutherford
Robert Sorrell

Inventor
Gottlieb Daimler
By
James L. Norris
Atty.

# UNITED STATES PATENT OFFICE.

GOTTLIEB DAIMLER, OF CANNSTADT, WÜRTEMBERG, GERMANY.

## ENGINE-DRIVEN VEHICLE.

SPECIFICATION forming part of Letters Patent No. 376,638, dated January 17, 1888.

Application filed October 12, 1885. Serial No. 179,692. (No model.) Patented in England September 11, 1885, No. 10,786; in Belgium October 15, 1885, No. 70,293; in Italy December 17, 18-5, No. 18,955; in France December 21, 1885, No. 171,261; in Austria-Hungary February 18, 1886, No. 32,523 and No. 2,203, and in Spain March 26, 1886, No. 8,264.

*To all whom it may concern:*

Be it known that I, GOTTLIEB DAIMLER, a citizen of Würtemberg, residing at Cannstadt, in the Kingdom of Würtemberg and Empire of Germany, have invented an Improved Vehicle Driven by a Gas or Petroleum Motor-Engine, (for which I have obtained patents in Great Britain, dated September 11, 1885, No. 10,786; Belgium, dated October 15, 1885, No. 70,293; Italy, dated December 17, 1885, No. 18,955; France, dated December 21, 1885, No. 171,261; Austria-Hungary, dated February 18, 1886, No. 32,523 and No. 2,203, and Spain, dated March 26, 1886, No. 8,264,) of which the following is a specification.

This invention relates to an improved vehicle driven by a gas or petroleum motor-engine, the construction of which will be readily understood on reference to the accompanying drawings, in which Figure 1 shows a sectional side elevation; Fig. 2, a cross-section; Fig. 3, a sectional plan; Fig. 4, a side elevation to a small scale. Figs. 5 to 8 show the same views of a modified arrangement for adapting the vehicle as a sledge. Fig. 9 shows a sectional elevation of the motor-engine. Fig. 10 shows a side view of the same. Fig. 11 shows a vertical section of the apparatus for vaporizing petroleum, and Fig. 12 shows a plan of the same.

The vehicle consists of the framing 1, with seat 2, steering-wheel 3, and driving-wheel 4, arranged as a bicycle, as shown at Figs. 1 to 4. The motor-engine 5, with its petroleum-reservoir 6, is hung as low as possible between the sides of the framing, being fixed on caoutchouc buffers 8 by means of screw-bolts 7, so as to afford a somewhat elastic connection, and thus prevent as much as possible the shocks of the explosions from being communicated to the vehicle. To the foot-boards 9 on each side are connected spring-arms carrying rollers 10, that steady the vehicle in the vertical position and at the same time permit of its assuming an inclined position on curves.

The steering-wheel 3 is worked from the axis of a steering-spindle, 14, with handles 15, by means of disks 11 and 12, to which is attached the endless band or chain 13. The two disks 11 and 12 are connected by a helical spring, 16, in tension, which is in line with the axes of the disks, and consequently is least expanded when the steering-wheel is in line with the driving-wheel, and thus tends to keep it in that position.

The motor-engine drives the driving-wheel through a loose endless band, 17, that is tightened by means of the pulley 19, mounted on the elbow-lever 18, having its fulcrum on the crank-shaft of the engine, while its free end is connected to a cord, 21, that passes up through the hollow axis 14, and is wound two or three times round the spindle 20 of the steering-handles, and then passes back again through the axis, the other end of the cord being connected to the brake-lever 22. Thus on rotating the handles in one direction, so as to apply the brake, the lever 18 and pulley 19 are at the same time released, so as to slacken the band 17, and thus allow the engine to continue running while the vehicle is stopped or retarded. On turning the handles in the contrary direction the band 17 is tightened and the brake is taken off. The steering-spindle carries a small toothed wheel, 23, with which gears a fixed pawl, 24, so as to hold the spindle in whatever position it is turned into.

The driving-pulley 25 is loose on the engine-shaft 32, but is carried round thereby by means of the friction-disks 26 and 27, the pressure of which is adjusted by means of the screw 29 and spring 28, so that when the resistance of the vehicle exceeds the maximum power of the engine the pulley 25 will slip between the friction-disks, and thus the stopping of the engine under these conditions will be prevented.

The motor-engine is of the same construction as that described in my application for Letters Patent No. 165,390, of June 15, 1885, and need, therefore, not be further described. 30 is a receiver for the products of combustion, from which they escape through a pipe, as shown, and which serves to warm the seat in cold weather. Air is driven through the casing 33 of the engine by the fan 31 on the engine-shaft 32, so as to cool the cylinder 34, and the heated air issuing from the top of the casing also serves to warm the seat and escapes at the foot-boards 9 at bottom.

The entire engine is inclosed by a casing, 35, attached to the seat 2, thus forming a chamber for warming the latter, and also protecting the engine against dust. At top are provided two openings with flaps 36 and 37, by opening which the hot air can be allowed to escape when the seat does not require warming.

The engine is set in motion before starting by means of the crank-handle 38, which fits with a pin into a hollow of the engine-shaft 32 and gears with ratchet-teeth 39 into the end thereof, the incline of the teeth being in such a direction that when the engine starts working the clutch will be automatically disengaged by the action of the inclines, and the crank-handle can be removed.

The petroleum apparatus consists mainly of the reservoir 6, Figs. 11 and 12, with float 40, having a tube, 41, sliding telescopically in the tube 42, fixed to the cover 43 of the reservoir, and opening at its upper end into the atmosphere. By the action of the engine air is drawn in through the tubes 41 42, by preference from the warm-air supply under the seat, in order by the heat to facilitate the evaporation of the petroleum, through which the air bubbles on issuing through the perforations 44 of the tube 41. This air-supply, charged with petroleum-vapor, passes through the spaces 45, 46, and 47 into the supply-pipe of the engine, receiving at the regulating-valve 48 the requisite addition of atmospheric air for effecting perfect combustion, in a manner well understood. The space 47 is separated from 46 by means of a partition, 49, of wire-gauze or perforated metal, and it has an escape-valve, 50, so that should the flame of the engine flash back to the reservoir it cannot pass beyond the partition, and any pressure produced in 47 will escape through the valve.

In place of the vaporizing apparatus may be employed a spraying apparatus of any suitable known construction; or if the engine is to be worked with ordinary combustible gas the apparatus may be replaced by a reservoir of compressed gas with suitable reducing-valve to the supply-pipe.

The modification shown at Figs. 5 to 8 only differs from the foregoing in the substitution of a steering sledge-runner, 3, for the steering-wheel, in providing the driving-wheel 4 with spikes for gripping the ice or snow, and in the substitution of runners 10 for the supporting-rollers. The brake 22 is in this case applied to the ground instead of to the driving-wheel.

The above-described vehicle may also be employed for transporting loads.

I do not herein broadly claim the petroleum-vaporizing apparatus shown in Fig. 11, as it constitutes the subject-matter of my application for Letters Patent filed March 4, 1886, Serial No. 194,036.

Having thus described the nature of my invention and the best means I know for carrying the same into practical effect, I claim—

1. The combination, with a vehicle comprising a frame, 1, a ground steering device, 3, and a ground driving-wheel, 4, of the gas or petroleum motor-engine 5 and its reservoir 6, suspended centrally from the frame between the driving-wheel and steering device, with its center of gravity in the plane of the track traversed, and traveling side supports, 10, extending from the motor-engine frame to travel on the ground and laterally brace and support said engine-frame, substantially as described.

2. The combination, with the framing 1, driving-wheel 4, and steering-wheel 3, of the gas or petroleum motor-engine 5, and reservoir 6, suspended centrally from the framing, so that its center of gravity is in the plane of the track, and so that it only partially participates in the vertical oscillations of the vehicle, the motor-engine being suspended in an elastic manner, and the vehicle being supported laterally by spring-rollers, substantially as herein described.

3. The frictional connection of the driving-pulley 25 with the engine-shaft, adjustable by spring 28, and screw adjustment, whereby when the resistance of the vehicle exceeds the maximum power of the engine the driving-pulley can slip on the engine-shaft.

4. The combination of the elbow-lever 18, with tightening-pulley 19, driving-strap 17, cord 21, steering-spindle 20, and brake-lever 22, whereby when the brake is applied the driving-band is slackened.

5. The combination, with the engine-shaft, of the fan 31 and removable crank-handle 38, with ratchet-clutch 39, whereby the engine is put in action in the first instance.

6. The inclosed chamber 35 beneath the seat, into which the hot air from the engine passes, and which is also warmed by the receptacle for the products of combustion for the purpose of warming the seat.

7. In combination with the chamber 35, heated by the hot air, the openings provided with flaps 36 and 37, whereby the hot air is allowed to escape when no heating is required.

8. The combination of the frame 1, the ground wheel 4, the ground steering-runner 3, a gas or petroleum motor-engine, 5, elastically suspended from the frame between the ground-wheel and steering-runner, and yielding side runners, 10, extending from the engine-frame and laterally bracing and supporting the engine-frame, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 21st day of September, A. D. 1885.

GOTTLIEB DAIMLER.

Witnesses:
EUGEN ZEILLER,
ALBERT ROLLER.