No. 682,194. Patented Sept. 10, 1901.

H. K. HESS.

STEAM PROPELLED VEHICLE.

(Application filed Dec. 10, 1900.)

(No Model.)

Fig. 1.

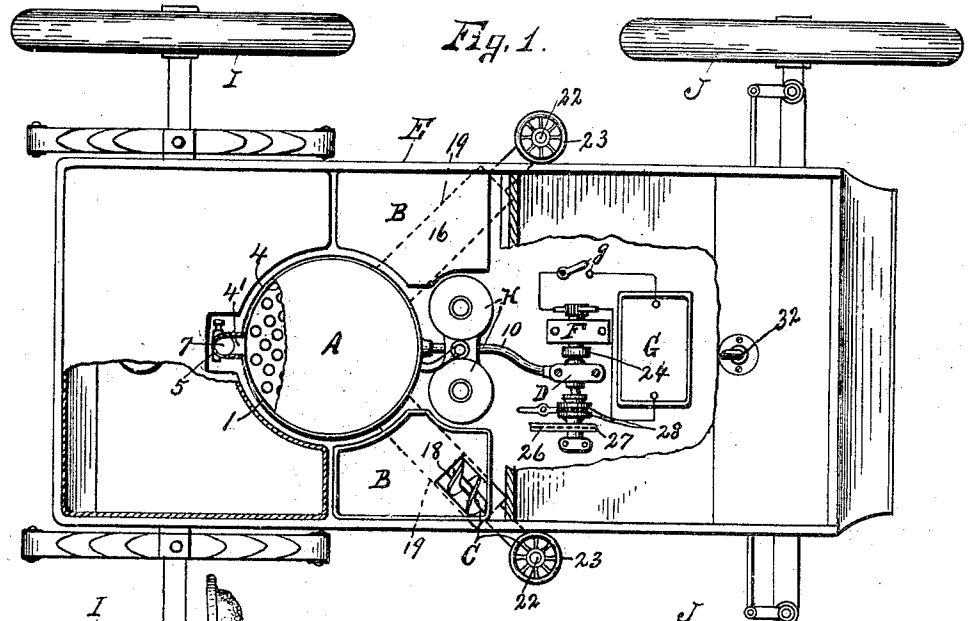


Fig. 2.

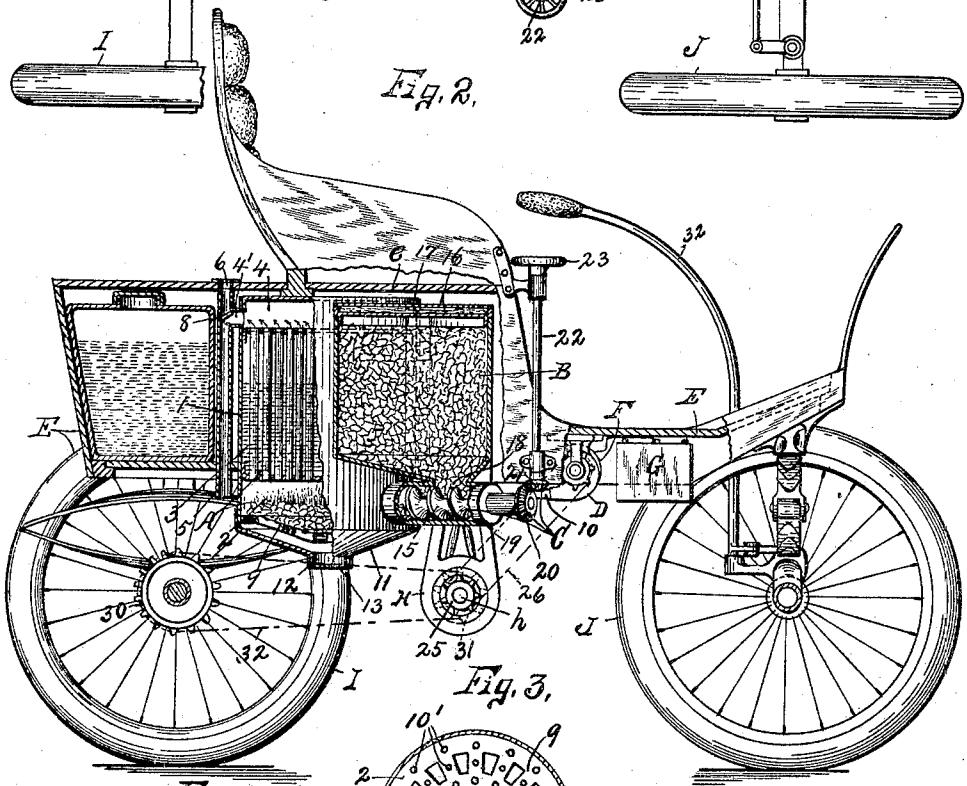


Fig. 3.

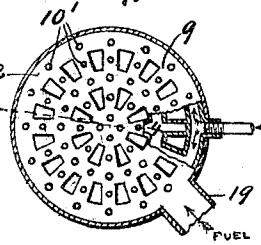
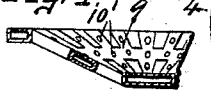


Fig. 4.



WITNESSES.

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HENRY K. HESS, OF PHILADELPHIA, PENNSYLVANIA.

STEAM-PROPELLED VEHICLE.

SPECIFICATION forming part of Letters Patent No. 682,194, dated September 10, 1901.

Application filed December 10, 1900. Serial No. 39,277. (No model.)

To all whom it may concern:

Be it known that I, HENRY K. HESS, of Philadelphia, in the county of Philadelphia, in the State of Pennsylvania, (post-office address 729 Filbert street,) have invented new and useful Improvements in Steam-Propelled Vehicles, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in steam-propelled vehicles, and particularly to the class commonly known as "automobiles," the object being, first, to provide a carriage with a suitable steam-generator having a closed combustion-chamber in which any carbonaceous solids, such as charcoal or equivalent material, may be readily burned as fuel; second, to provide a suitable reservoir for the charcoal or equivalent fuel; third, to provide manually-operated means for feeding the charcoal or similar solids to the combustion-chamber, and, fourth, to provide means actuated by the traction-wheels of the vehicle or by an independent motor for forcing air through the fuel.

To this end the invention consists in the combination, construction, and arrangement of the parts of a steam-propelled vehicle, as hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a top plan, partly broken away, of an automobile embodying my invention. Fig. 2 is a side elevation, partly in section, of the parts seen in Fig. 1. Fig. 3 is a horizontal sectional view through the combustion-chamber, showing particularly the grate and air and fuel inlet openings. Fig. 4 is an enlarged sectional view on line 4 4 of Fig. 3.

Similar reference characters indicate corresponding parts in all the views.

This invention consists, essentially, of a steam-generator A, fuel-reservoir B, and manually-operated means C for feeding fuel from the reservoir to the combustion-chamber of the generator A, and an air-pressure device D, forcing air through the fuel. This generator A may be of any desired construction, is supported on the body of the vehicle, preferably beneath the seat, and usually consists of a cylindrical drum 1, having a combustion-chamber 2 and a water-containing chamber 3. The upper portion of the generator is provided with a chamber 4 for receiving the products of combustion, which are conducted by a branch conduit 4′ to oppositely-extending conduits 5 and 6, the conduit 5 being arranged to discharge beneath the body of the vehicle and the conduit 6 being adapted to discharge above the body of the vehicle at the rear of the seat in the usual manner. In order that the escaping products of combustion may be conducted through either of these conduits 5 or 6 as may be desired, I provide a suitable damper or deflector 7, pivoted at 8 to the wall of the conduit and movable into and out of engagement with the upper and lower walls of the outlet-conduit 4′, connecting the chamber 4 with said conduits 5 and 6.

The base of the generator forming the combustion-chamber is provided with a grate 9, which preferably consists of a hollow conical frame having its apex extending downwardly and forming a suitable hopper for receiving the fuel and concentrating the same toward the center of the grate. This hollow grate 9 is connected to the air-feeding device D by a conduit 10, the upper wall of said grate being provided with a series of perforations 10′, which serve to discharge the air through the fuel, thereby facilitating the combustion of said fuel and producing an intense heat within the combustion-chamber beneath the water-containing chamber 3. The shell 1 of the generator preferably extends beneath the grate and is provided with a downwardly-deflected base 11, also of conical form, for forming a suitable ash-pit, the apex of the base 11 being provided with an opening 12, having a detachable cap 13 for permitting the ashes to be removed when desired.

It is apparent from the foregoing description that the generator herein described is applicable for use with any carbonaceous fuel solids—such as charcoal, which is quickly ignited and is preferably employed in connection with my invention—and that by perforating the grate and forcing air through the perforations into the mass of charcoal an intense degree of heat is maintained with a very slight expense. The force of the air escaping through the perforations also serves to remove the ashes from the fuel and grate, which greatly adds to the efficiency of the generator.

The means for supplying fuel to the combustion-chamber of the generator consists of the reservoir B and a mechanical feed, preferably consisting of a screw 15. I preferably employ two of these reservoirs and a mechanical feed for each reservoir, and both being identical in construction it will be necessary to describe only one of these feeding mechanisms. The reservoir B is supported on the body of the vehicle E and preferably beneath the seat, which is provided with a removable bottom wall *e* for permitting access to the underlying mechanisms and also for the purpose of permitting the fuel-reservoir to be refilled when necessary. This reservoir is provided at its upper end with a removable cap 16, having separated walls for receiving a suitable non-heat-conducting material 17. The lower end of the reservoir is provided with a discharge-opening 18, communicating with a cylindrical extension 19, which in turn communicates at one end with the combustion-chamber. The extension 19 is arranged to receive the screw 15, which preferably extends on opposite sides of the opening 18, one end being extended inwardly in proximity to the discharge end of the cylindrical conduit 19, and its other end is provided with a suitable gear 20, meshing with the pinion 21, said pinion 21 being mounted on the lower end of a shaft 22, having its upper end provided with a suitable hand-engaging wheel 23, whereby the screw may be readily rotated by the operator of the vehicle when desired to supply fuel to the combustion-chamber. The opening 18 in the base of the fuel-reservoir B being of less area than the cross-sectional area of the fuel-reservoir, I preferably arrange the bottom walls of said reservoir in inclined planes converging toward said opening for the purpose of automatically feeding the fuel by gravity through said opening to the cylindrical conduit 19. This combination of the fuel-reservoir and the mechanical feed is particularly simple and permits the use of charcoal or similar inexpensive carbonaceous fuel, which may be fed whenever desired by the screw 15 to the combustion-chamber. This screw 15, being extended toward the combustion-chamber beyond the opening 18, serves as a check-damper for preventing the escape of the heat to the fuel-reservoir.

The means for supplying air to the combustion-chamber preferably consists of a centrifugal pump or fan D, which is connected by a conduit 10 to the hollow grate 9. Any desired means may be employed for operating this pump or fan; but I preferably employ an electric motor F, which is electrically connected to a source of electric energy, as a battery G, said connection being provided with a suitable switch *g* for controlling the action of the motor. The motor F and the fan D are usually mounted on separate shafts alined with each other and having their adjacent ends in close proximity and provided with a suitable clutch 24, whereby the fan may be rotated in one direction by the motor when the vehicle is at rest and whereby said fan or pump may be similarly rotated by mechanical means hereinafter described and operated by the moving vehicle without operating the motor. This mechanical driving means for the fan D preferably consists of a sprocket-wheel 25, mounted on the shaft *h* of an engine H and connected by a suitable chain 26 to a similar sprocket-wheel 27, loosely mounted on the shaft of the fan and provided with a clutch 28 for rotating the fan in one direction and permitting the fan to be rotated in the same direction by the motor independently of mechanical driving means.

The vehicle may be propelled in any desired manner, as by the usual sprocket-wheels 30 and 31, connected, respectively, to the rear wheels I and to the shaft of the engine, and a sprocket-chain 32, connecting said sprocket-wheels 30 and 31. The vehicle may also be guided in any desired manner, as by a steering-rod 33, having its lower end connected in the usual manner to the front wheels J.

The operation of my invention is as follows: The reservoirs B are filled with charcoal or similar inexpensive fuel, which gravitates through the opening 18 into the cylindrical conduit 19. The screw 15 is then rotated by means of the handpiece 23 for forcing the fuel into the combustion-chamber. The fuel within said combustion-chamber is then ignited by removing the cap 13 at the apex of the ash-pan 11. The blower D is then operated by the motor F for producing an air-blast within the combustion-chamber through the fuel, whereby the combustion of the fuel is facilitated and a high degree of heat is obtained within a very short space of time. The products of combustion passing upwardly through the flues into the chamber 4 and passing outwardly through the branch conduit 4′ may be deflected either upwardly or downwardly by the damper 7. When the vehicle is in motion and it is desired to force air into the combustion-chamber, the clutch 28 is moved into operative position for rotating the fan.

It is evident from the foregoing description that a large quantity of fuel may be carried by the vehicle and supplied to the combustion-chamber as desired, and that the degree of heat within said combustion-chamber may be regulated by the fan D, which may be operated either by mechanical or electric means, as above described.

The operation of my invention will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be noted that considerable change may be made in the detail construction and arrangement of the component parts of my invention without departing from the spirit thereof. Therefore I do not limit myself to the precise construction and arrangement shown and described.

Having thus fully described my invention,

what I claim, and desire to secure by Letters Patent, is—

1. In a steam-propelled vehicle, the combination with the vehicle-body, of an engine and a steam-generator mounted in the body and provided with a charcoal-burner for the purpose specified and a manually-operated feed having an operating member in proximity to the seat of the vehicle for feeding the charcoal to the burner.

2. In a steam-propelled vehicle, the combination with the vehicle-body, of an engine and a steam-generator mounted in the body and provided with a charcoal-burner, a charcoal-reservoir also mounted in the body and arranged to discharge into the burner and means in proximity to the seat of the vehicle for controlling the feed of charcoal from the reservoir to the burner.

3. In a steam-propelled vehicle, the combination with the vehicle-body, of an engine and a steam-generator mounted in the body and provided with a charcoal-burner, a charcoal-reservoir also mounted in the body and arranged to discharge into the burner, and manually-operated means having a handpiece in proximity to the seat of the vehicle for feeding the charcoal from the reservoir into the burner.

4. In a steam-propelled vehicle, the combination with the vehicle-body, of an engine, and a steam-generator mounted in the body and provided with a charcoal-burner extending beneath the body, a charcoal-reservoir discharging into the burner and manually-operated means having an operated member in proximity to the seat of the vehicle for feeding the charcoal from the reservoir to the burner.

5. The combination with a vehicle-body having upper and lower decks and a seat, of an engine, a steam-generator mounted in the body and provided with a charcoal-burner in its base and a smoke-chamber in its top, a movable cap or closure for the base of the burner, a smoke-flue connected to the smoke-chamber and extending through the upper and lower decks at the rear of the seat, and a movable deflector-plate in said flue for diverting the smoke upwardly or downwardly through the flue for the purpose described.

6. The combination with a vehicle-body having a seat, of a steam-generator mounted on the body and having a charcoal-burner at its base, said burner having a movable closure, a charcoal-reservoir discharging into the burner, and a manually-operated feed carried by the vehicle and operated from the seat for forcing the charcoal from the reservoir to the burner.

7. The combination with a vehicle-body, of a steam-generator mounted on the body and having a charcoal-burner at its base, a charcoal-reservoir discharging into the burner, a rotary screw-feed movable in the base of the reservoir for feeding the charcoal to the burner, and a handpiece supported on the body in proximity to the seat of the vehicle and connected to actuate the screw.

8. In a steam-propelled vehicle, the combination with the body and seat, a steam-generator mounted in the body beneath the seat and provided with a charcoal-burner having a hollow grate formed with a perforated upper wall, said burner having an opening beneath the grate and bottom of the vehicle-body, a removable closure for the opening, and means carried by the vehicle for forcing air into the hollow grate.

9. The combination with a vehicle-body having upper and lower decks and a seat, a steam-generator having its upper portion arranged between the decks and provided with a smoke-chamber and its lower portion provided with a charcoal-burner having a hollow grate, a smoke-conduit connected to said chamber and extending through the upper and lower decks, charcoal-reservoirs partially surrounding the generator and having their lower portions discharging into the burner and independent operating members in proximity to the seat of the vehicle for controlling the feed of the charcoal to the burner.

10. The combination with a vehicle-body, having upper and lower decks and a seat, a steam-generator having its upper portion arranged between the decks and provided with a smoke-chamber and having its lower portion provided with a charcoal-burner, a smoke-conduit connected to said chamber and extending through the upper and lower decks, charcoal-reservoirs discharging into the burner, independent feeds in the bases of the reservoirs, and a handpiece for each of the feeds supported in proximity to the seat of the vehicle.

In witness whereof I have hereunto set my hand on this 5th day of December, 1900.

HENRY K. HESS.

Witnesses:
H. E. CHASE,
HOWARD P. DENISON.