The

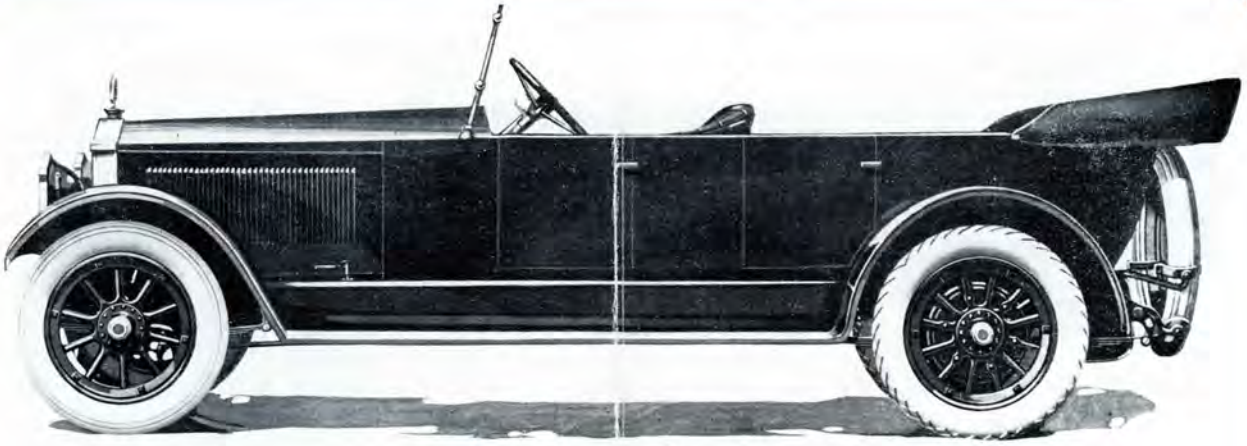
Scott-Newcomb

Automotive

Steam System

The *ultimate power* for automobiles, trucks or tractor because it is *cheaper to operate*, cheaper to maintain, more simple, more reliable, and answers every ideal aimed at for this work

STANDARD ENGINEERING CO.
ST. LOUIS, U. S. A.



The Scott-Newcomb Motor Carriage

SCOTT-NEWCOMB AUTOMOTIVE POWER PLANT

Steam can be raised from COLD boiler in *less* than ONE MINUTE—

Just turn a switch—no manual operations required.

Boiler will last the life of the car—non explosive—will not prime.

Kerosene fuel, completely burned. LONGER FUEL MILEAGE.

Very rapid acceleration, without gear shift.

Very flexible—will creep at ¼ M. P. H. on hill or level.

Control by throttle—very quiet—no vibration.

High torque at low speeds.

Small number of slow moving parts—more simple—more durable.

Can be reversed while going full speed ahead.

Cannot "kill" the engine at some critical moment.

No transmission, gear shift, clutch, fly wheel, drive shaft, uvl. joints, magneto, carburetor, etc.

No knocking of the engine, regrinding valves, burning carbon, racing of motor, smoky exhaust, choking of carburetor.

Long tire mileage due to ease of starting.

Less oil.

TROUBLES (with other steam cars) WE HAVE ELIMINATED

Long time required to raise steam.

Danger from fire and explosion.

Labor and knowledge required in getting up steam.

Short life of boiler.

Objectionable noise made by fire and water pumps.

Cracking of refractory linings.

Pilot light and main burner clogging with carbon.

Numerous unreliable automatic devices.

The use of two fuels, both under pressure.

Short water mileage.

Freezing in cold weather.

Spark plug and boiler coil sooting.

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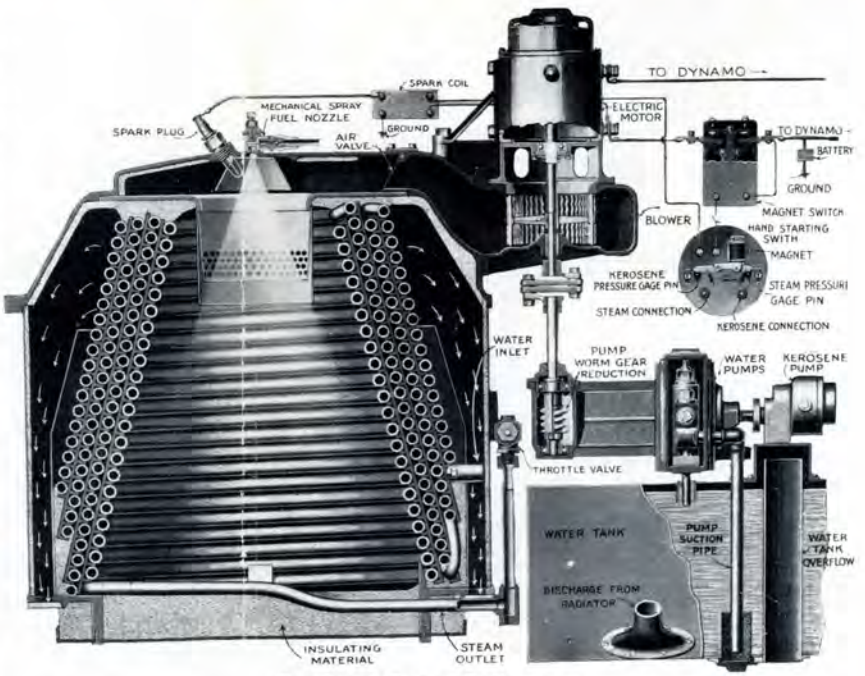
Parts Under Hood

The Scott-Newcomb Steam System

BOILER. The boiler is of continuous flow type, consisting of frusto conical coils connected in series so as to form a continuous tube through which the water fed to the boiler and the steam discharged from the boiler must pass. These coils are arranged one within the other around a central combustion chamber. Water enters the bottom of the coil most remote from the fire, and steam is discharged at the lowest point of the coil next to the fire. The car will run one mile on the stored steam in the boiler, after the fire has been shut off.

COMBUSTION SYSTEM. We use KEROSENE fuel only, which is ignited COLD by an electric spark. The spark plug circuit is cut off after two seconds operation, by a switch operated by the kerosene gauge.



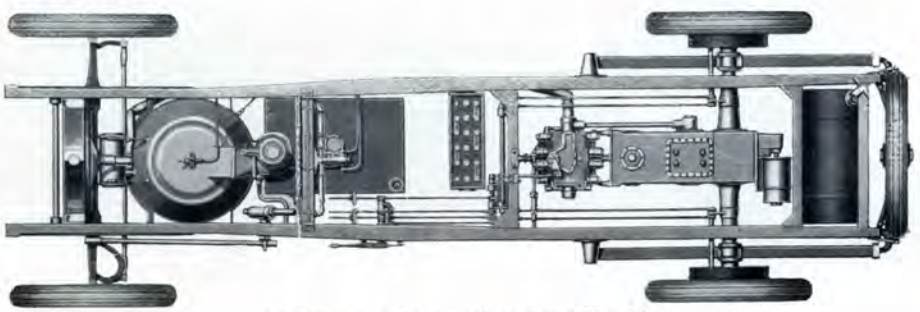
Sectional Cut of Boiler, etc.

No pressure is carried on the fuel tank. When the fire is on, fuel is pumped by a small electric motor (said motor also runs the water pump and air blower), to a mechanical atomizing nozzle and discharged in a very fine spray at 35 lb. pressure, and directed downward from the top of the boiler into the combustion chamber—said combustion chamber is entirely surrounded by boiler coils and has a refractory lining at the bottom. The fuel atomizing nozzle is arranged to hold back the fuel until proper spraying pressure is reached.

The air reservoir at the top of the boiler connects to the discharge side of the blower—air passes to the combustion chamber and mixes with the fuel spray to complete combustion. There is an automatic air valve on the discharge side of the blower, which opens when the blower is running and closes when the blower is shut off—thereby preventing the back flow of heat from the combustion chamber.

The products of combustion pass between the convolutions of the coils successively in a direction opposite to that in which the water flows.

CONTROL SYSTEM. As the water and fuel pumps are driven by an electric motor, these liquids are pumped in definite quantitative relation. The length of time that the motor is "on" depends on the demand for steam. If the car is running at 25 miles per hour on level road, the motor will be on about ⅓ of the time. If running up a hill at the same speed the fire might be on all of the time. If running at 60 miles per hour on a level road the fire would be on all of the time. It is a very easy matter to see the advantage of using an electric motor of constant speed in place of driving the pumps from the engine. This drive also has the advantage of locating all parts containing water, right at the boiler.



Top View of Motor Carriage Chassis

The starting and stopping of the motor is controlled by the steam pressure gauge. This gauge operates a small switch which is set to open the circuit at 600 lbs. steam pressure and to close the circuit when the steam pressure has dropped to 500 lbs. This differential action is brought about by two forces—one, a small magnet on the back of the gauge, the other, a pin on the Bourdon tube of the gauge. At the time the switch is closed, the water and fuel pumps, air blower and spark plug all operate in substantial unison.

Boiler

To avoid handling the motor current on the gauge switch, and to get a quick acting switch in motor circuit, we use a MAGNET SWITCH which operates in the motor line. The magnet switch takes ½ ampere to operate it and this is the current carried by the gauge switch.

A STEAM TEMPERATURE GAUGE is used to indicate the temperature of the steam, which runs from 600 to 750° F. This gauge has an electric switch which closes at 800° F. at which time the fuel will be automatically cut off from the combustion chamber. This switch seldom comes into action in the normal working of the system.

ELECTRICAL EQUIPMENT. We use an electric motor, a storage battery and a dynamo; our motor and dynamo have "compound" windings, and the series fields of the motor and dynamo are connected in series. The dynamo furnishes all of the current to the motor direct—when the motor shuts off, the series field of the dynamo is automatically cut out, thereby reducing the dynamo output to a current suitable for charging the battery.

THROTTLE VALVE. The throttle valve is made of non-rusting material. Steam cannot pass the seat of the valve until said valve seat has a full opening, thereby preventing wire drawing which tends to destroy the valve seat. The throttle valve will close automatically when the brake is applied.

WATER PUMP. Our water pump is absolutely noiseless and is designed to **eliminate stuffing boxes** and wear on the plunger and cylinder. The entire pump is immersed in oil and requires no adjustment.

ENGINE. Our engine is of the semi uniflow, two cylinder, double acting poppet valve type. Valves and piston rods are made of non-rusting material. The valves never need to be reground. Different points of cut-off and reverse are obtained by simply shifting the cam shaft—this cam shaft is made of special shape to permit easy shifting and to allow an infinite number of cut-offs. No stuffing boxes are required on valve stems or piston rods. Two cylinders give a flexibility that cannot be approached by a 12 cylinder gas engine.

In pleasure cars we mount the engine partly on the rear axle and partly on the frame—the major portion of the weight of the engine is carried by the frame. The unsprung weight on the axle is very small. By this drive we eliminate the drive shaft and universal joints and get a smooth riding job. In truck work, we mount the engine on the frame of the car, using a standard rear axle.

MOTOR CARRIAGE DIFFERENTIAL. Our differential (motor-carriage) is of special design and has many unique features which are very desirable in connection with the engine mounting we use.

CONDENSING SYSTEM. To get long water mileage we must have an efficient engine and radiator—the steam inlet to radiator must be special. By carefully designing these parts, and by the use of an exhaust steam driven fan for the radiator, our water mileage compares favorably with that of gas cars.

Side View of Truck Chassis

Engineering Department

Besides Mr. L. L. Scott, Mr. A. C. Staley (lately of Stanley Co.), and other engineers on our staff, we have the exclusive services of Mr. E. C. Newcomb for steam plants.

Mr. Newcomb (aside from being consulting engineer for the Simplex Automobile Co.) spent six years at steam car development. Many fundamental patents were taken out by him.

Prof. R. C. Carpenter (Cornell University), considered the highest steam authority in this country, was on our staff until his death a short time ago.

All are members of the A. S. M. E. and S. A. E.

Patents

With the class of men in our employ, and the development work we have done, we have naturally taken out many valuable patents. Our patents relate to: Combustion system, boiler, combustion space, control systems, spark plug cut out, pump construction, engine, rear axle, exhaust fan motor, etc.

We have a thoroughly organized Patent Department, which has made a most thorough patent investigation covering this art. We do not infringe any patent.

Patent Fund

We have set aside a large fund for the protection of our patent rights. Infringements will be rigorously prosecuted.

Purposes

This company was organized for the sole purpose of developing a steam system, and licensing manufacturers to use the same. We shall continue development work and cooperate with licensees.

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