

water is compelled to pass before it is returned to the supply tank.

The feed water is automatically pumped from the supply tank to the boiler, but a hand pump is also provided for contingent use.

THE MILWAUKEE AUTOMOBILE COMPANY.

The carriages of this company, which is located at Milwaukee, Wis., are of the Stanhope or runabout style. The elevation of the Stanhope is shown in Fig. 60, and a plan of the running gear in Fig. 61. This company have adopted steam as a motive power as a well-trying and old servant and its ease of handling as well as its freedom from cumbersome transmission and reversing gear.

The frame consists, as will be seen, of a front and rear truss securely tied together by distance tubes, which contain universal joints. This entire structure is built of  $1\frac{1}{4}$ -inch seamless tubing, strongly braced together, and has frame connections of steel of the best quality, riveted and brazed in place.

The front truss carries the front wheels and complete steering linkage. This apparatus enables a movement of  $60^\circ$  to be given the front wheels, which controls the carriage with ease at any speed, and which will turn it completely around in a 15 foot circle.

The rear truss carries the driving mechanism and rear wheels. A compensating gear is provided in the middle of this truss to allow for unequal speed of each rear wheel. The gears of this device are of crucible steel, while the axles are the best quality of open-hearth machinery steel, and the hubs are keyed on in the most secure manner. The main driving sprocket (which also carries the brake shoe) has 30 teeth, 1-inch pitch and  $\frac{5}{16}$  inch wide.

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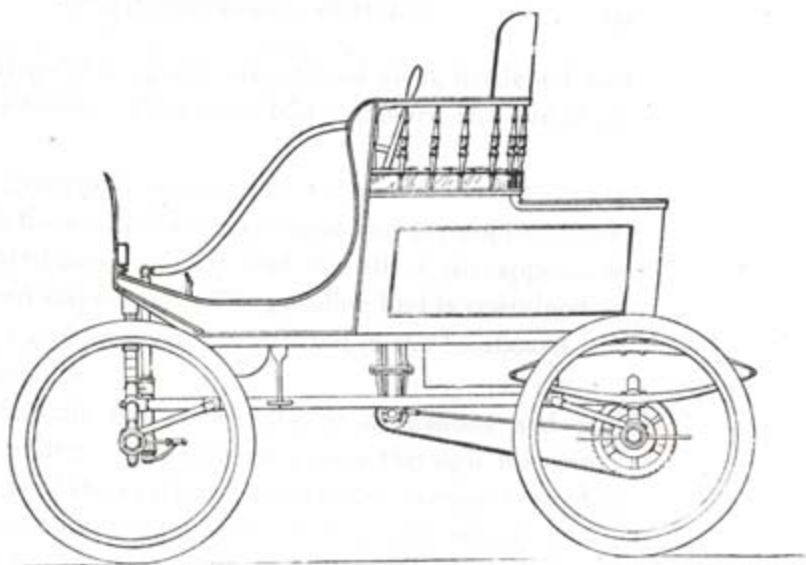


FIG. 60.—THE STEAM AUTOMOBILE.

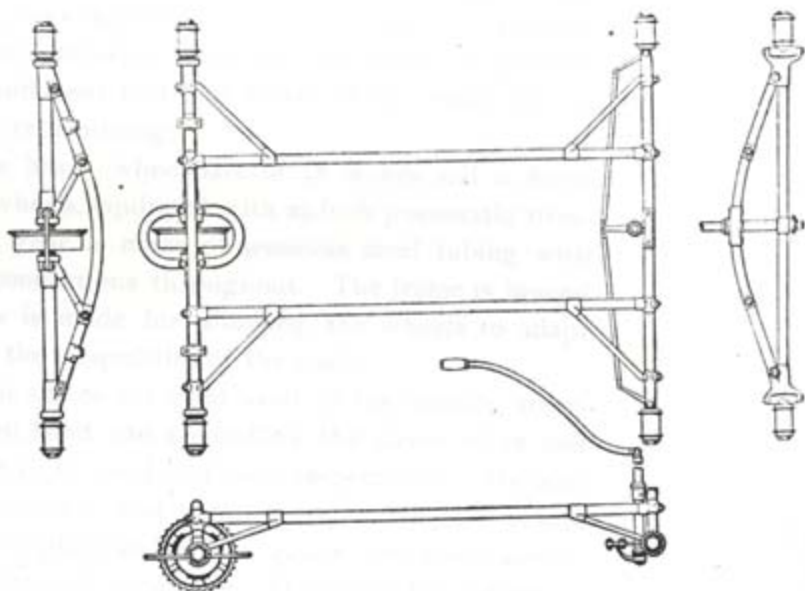


FIG. 61.—VEHICLE FRAME OF THE STEAM AUTOMOBILE.

The bearings throughout are of tool steel, hardened and ground to a finish. They have ball retainers, and are dust-proof.

Steam is generated in a vertical tubular boiler 12 inches high and 18 inches in diameter, containing 213 copper tubes. It is regulated automatically and has all of the appliances for safety and inspection. The gasoline fuel is contained in a tank of 3.7 gallons capacity, situated in the footboard, not shown in the cuts.

The water tank has a capacity of 15 gallons and surrounds the boiler. The exhaust passes through this tank. The engine is of the vertical, two-cylinder marine type, and runs at the rate of about 400 revolutions per minute at its highest efficiency, claimed to be between six and seven horse power. The power is transmitted by chain to the rear axle and gives the vehicle a maximum speed of 25 miles an hour. It will travel 10 miles on one gallon of gasoline and carries sufficient fuel and water in the tanks for 40 miles without replenishing.

The vehicle has a wheel-base of 58 inches and is fitted with 28-inch wheels, equipped with 2½-inch pneumatic tires. The running gear is made of seamless steel tubing with drop-forged connections throughout. The frame is braced and provision is made for allowing the wheels to adapt themselves to the inequalities of the road.

The operator sits on the right hand of the vehicle, steering with his left hand and controlling the steam valve and brake with the right hand and foot, respectively. He also has the reverse lever and pump valve within easy reach, while the water glass and steam gauge are conveniently located for occasional inspection. Owing to the automatic regulation the operator is required to attend only to the steering and throttle valve.