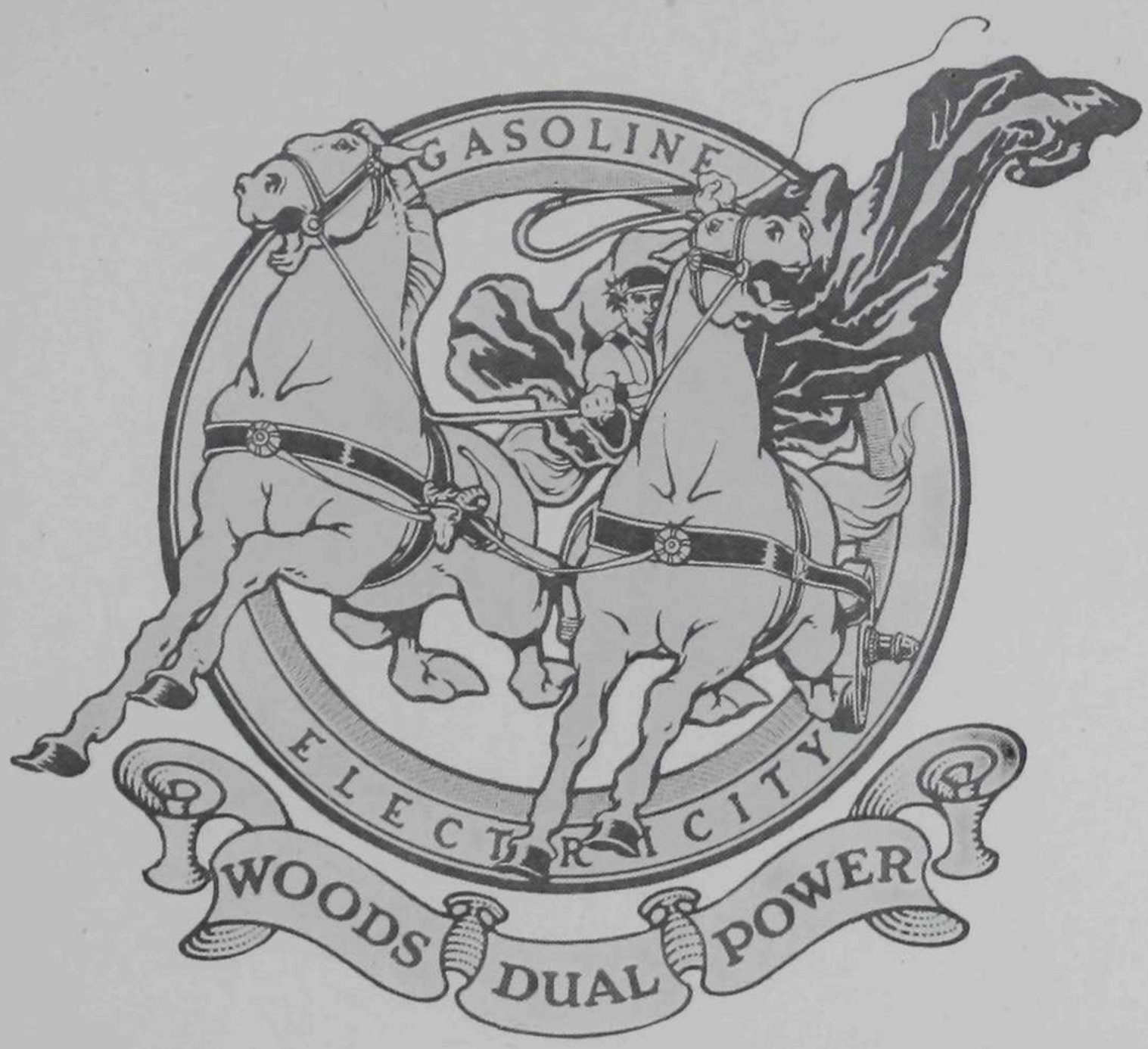
Woods

DUAL POWER



WOODS MOTOR VEHICLE COMPANY

TWENTY-FIFTH STREET AT CALUMET
AND COTTAGE GROVE AVENUES

CHICAGO · ILLINOIS

DEALERS IN PRINCIPAL CITIES

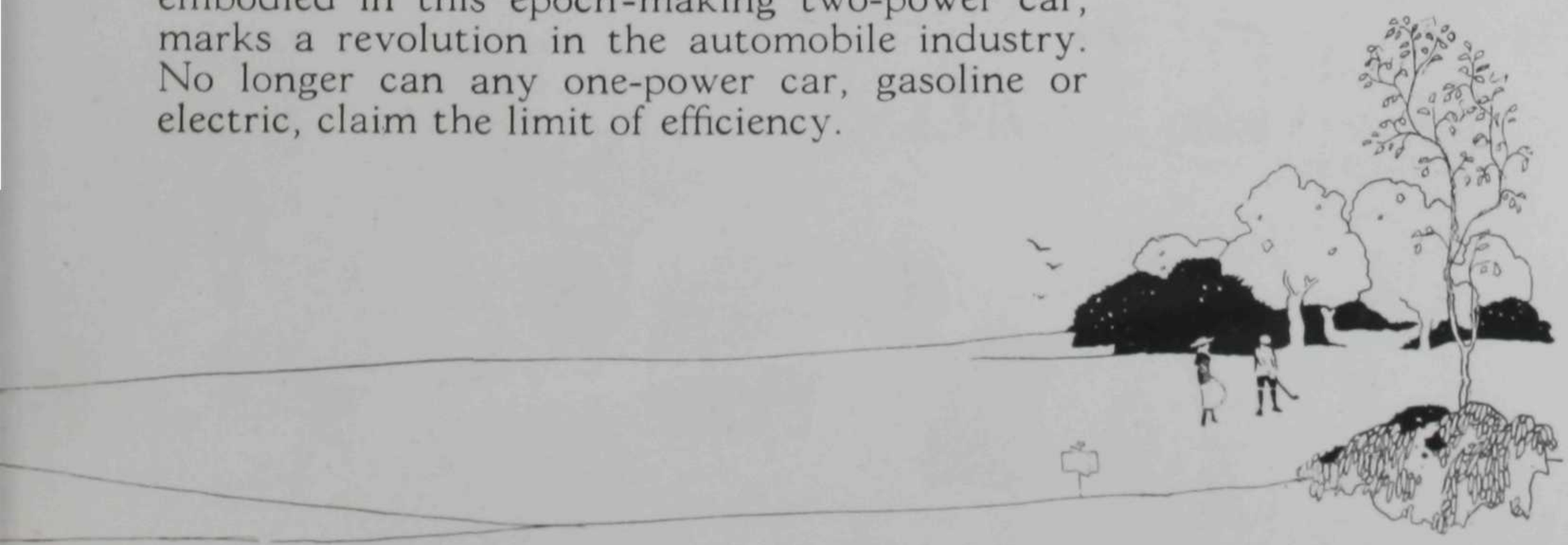
WONDERFUL gas cars have been made and wonderful electric cars have been made, but the glory of combining the two into one triumphant car must be awarded to the Woods engineers.

This ingenious combination creates the most astonishing results. The Woods Dual Power is more than a gas car — more than an electric. It has all of the advantages of each—none of their disadvantages. It can be run as a gas car or as an electric. But when the combination of these two powers is used, then comes all that can ever be hoped for in an automobile.

A self-charging, non-stalling, two-power car with unlimited mileage, adequate speed, and greatest economy.

It is surprisingly marvelous—not because it contains absolute departures in engineering practice—but because it combines all the better principles of two great divisions of automobile manufacture, previously separate units.

The logical evolution of motor development, embodied in this epoch-making two-power car, marks a revolution in the automobile industry. No longer can any one-power car, gasoline or electric, claim the limit of efficiency.



The Woods Dual Power is an automobile operated and controlled by the combined forces of electricity and gasoline.

It makes an electric with unlimited mileage and 40% greater speed; makes a gas car without gears, levers, clutch pedals, or any complicated parts, a double power unit with direct drive to the wheels, reducing jars, jolts and vibration to a minimum.

Picture a car with instantaneous acceleration, finger control of starting and stopping; an unlimited number of speeds; operations reduced; cost of maintenance lessened; efficiency and utility increased; outside charging plants eliminated.

Then add ease of control, noiseless movement, easy riding, refinement, luxurious appointments. —And, best of all, contentment of mind — the thought that power is continuous — a constant stream of unfailing, smooth-flowing power. Here in the Dual Power is speed, power, simplicity,

economy, and efficiency, each in a degree never before possible in any type of automobile.

Two small finger levers on the steering wheel control the entire operation of the car—starting, braking, stopping. One regulates the electric current, the other the gasoline.

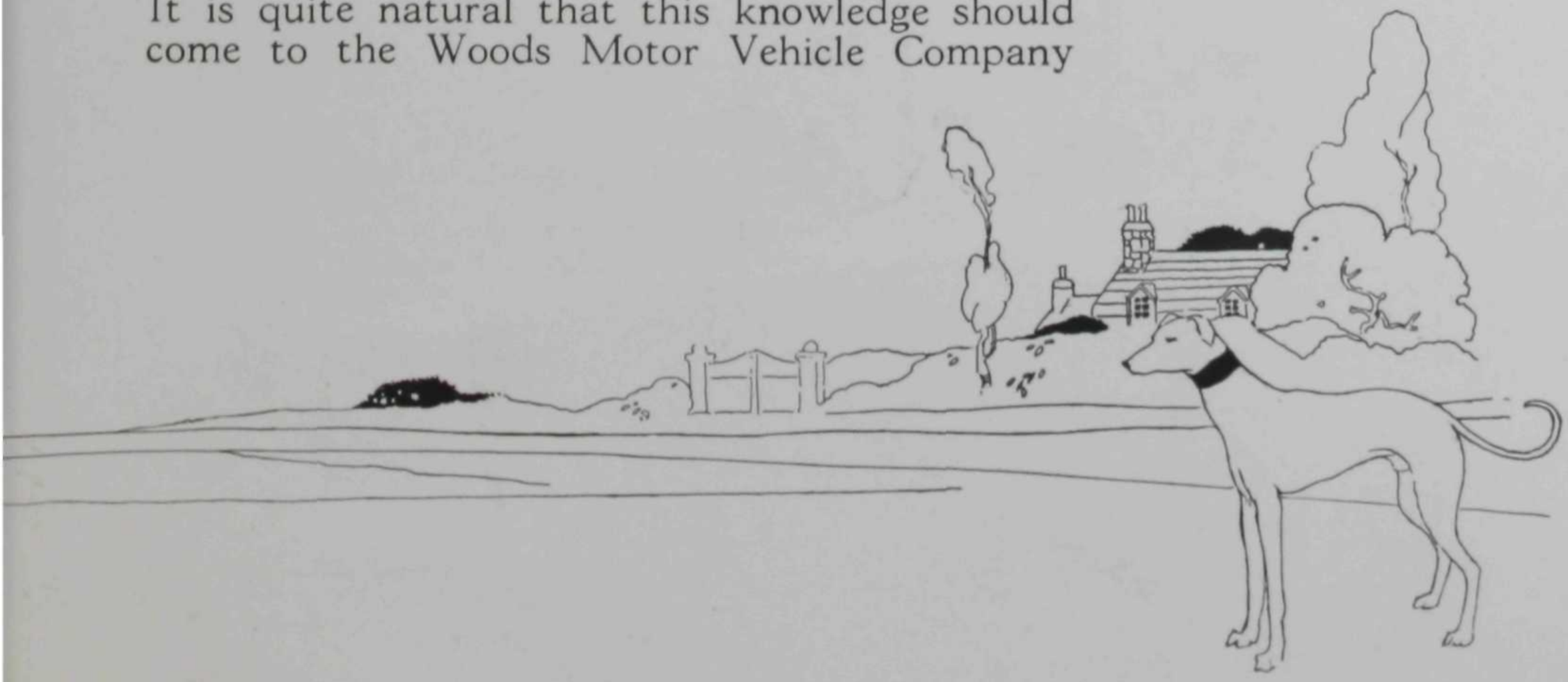
Here is a car with no waste of power—all is used for propulsion or for generating electricity. The result is utter independence of electric charging stations and a most sparing use of gasoline.

The Dual Power gives you, in combination, an indispensable all-season town car and the most reliable car for touring; in all a triumphant car that completely eclipses all previous motor achievements.

No one-power car can combine its simple efficiency, reliability, ease of control, serviceability, economy of up-keep.

The demand for a two-power automobile has long been recognized by Woods Engineers. This car was conceived as a result of the knowledge of the deficiencies of the electric and gas cars as individual types. In the Woods Dual Power the good features of each type have been combined into one and their disadvantages eliminated.

It is quite natural that this knowledge should come to the Woods Motor Vehicle Company

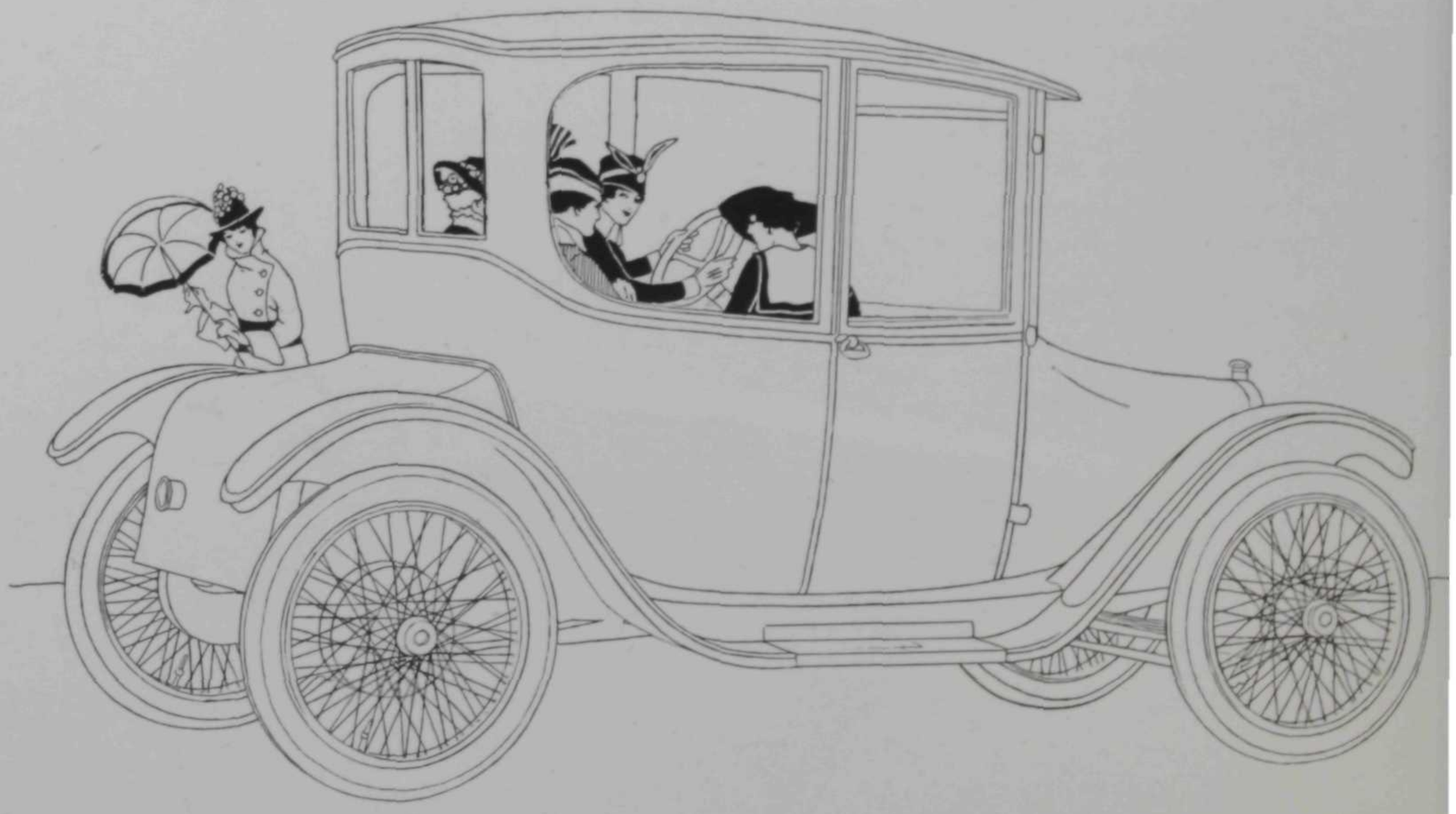


because its experience began with the inception of the motor car industry.

The evolutionary development of the Woods Electric, celebrated as the masterpiece of coach building and mechanical supremacy, the rapid advance of the gas car in which we have valuable experience, the application of electric equipment to gasoline cars, is well known. These conditions have created a popular interest and growing demand for a combination of these two mighty forces in a dual power car.

Always abreast of the times, the Woods Company has again scored a triumph in being the first to develop and perfect a two-power car controlled by both gasoline and electricity.

The performance of this car in starting, accelerating to any speed within the limits of the car, method of retarding speed, simplicity of operation and control have been demonstrated during the last two years.

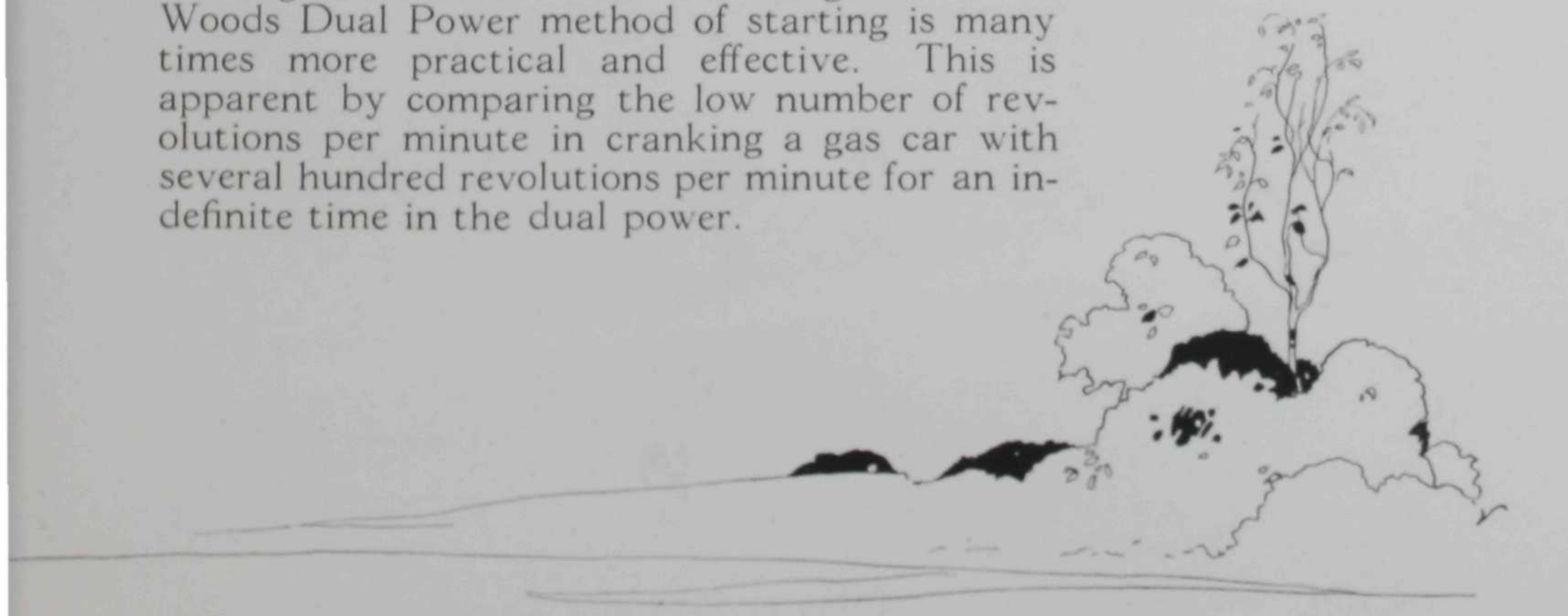


Its intrinsic merit and the mechanical and economic advantages of its equipment are apparent. Our own perfect faith in this car is evidenced by the fact that we have discontinued the building of a straight electric car and that our entire energies and wonderful facilities have been concentrated upon the Woods Dual Power.

The car starts as an electric by a simple movement of a finger-controlled lever on the steering wheel which operates a rheostat, the means for connecting the battery to the motor and increasing the speed as the lever is advanced. The operation of this one lever will drive the car twenty miles per hour on electric power alone.

While retaining all the best features of the electric, the battery is charged or discharged at will or automatically while the car is running, reducing maintenance expense and making it possible to travel any distance, storing electricity or using it for power as required.

With the electric lever at any advanced position, the first movement of the gasoline lever instantly starts the gasoline motor. While wonderful starting devices have been used on gas cars, the Woods Dual Power method of starting is many times more practical and effective. This is apparent by comparing the low number of revolutions per minute in cranking a gas car with several hundred revolutions per minute for an indefinite time in the dual power.

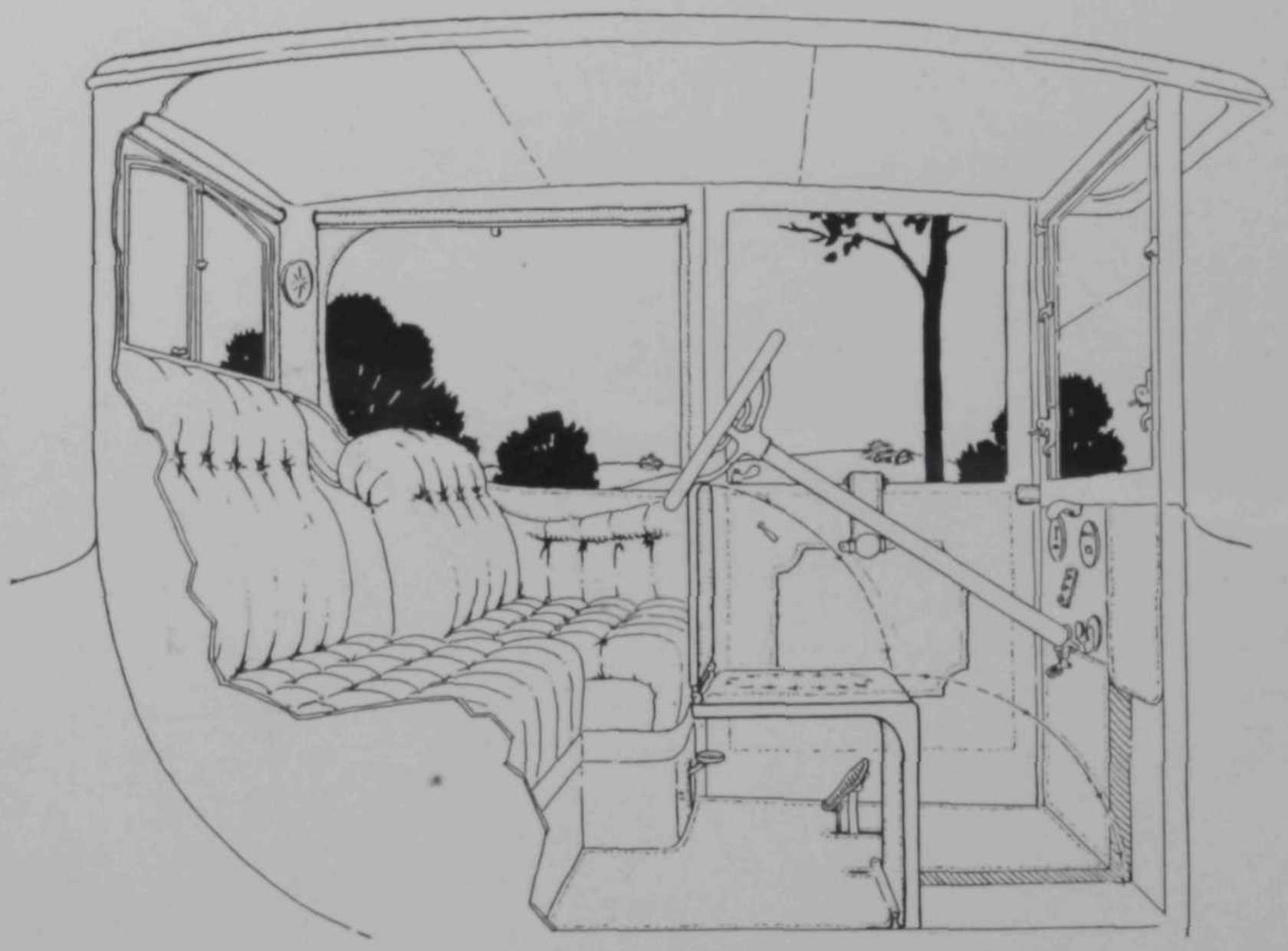


As the gasoline lever is moved forward it causes the car to be operated more on the gas and at a certain point it will run as a straight gasoline car, neither charging nor discharging the battery. A still further movement of the gas lever will cause the electric motor to become a generator and charge the battery.

While the two power elements employed in the operation of this car are electricity and gasoline, one supplementing and augmenting the other, it may be run on gasoline power alone. Thus we have a gas car with no clutches to throw in, no gears to change, with fuel consumption minimized and yet with the electric's simplicity and luxury.

Two small levers on the steering wheel control the entire driving of the car. Either lever may be operated by a slight movement of the finger.

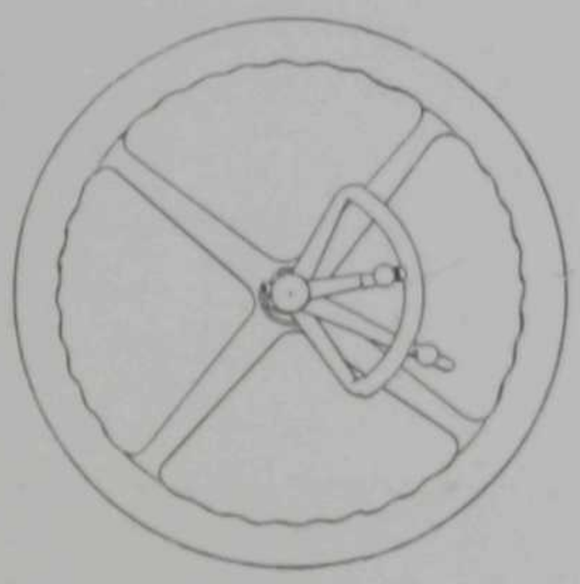
The longer lever controls the electric current and the shorter lever controls the gasoline motor. Thus we have dual power, or two power units combined into one. The extended movement of the two levers to their limit will give a speed of about thirty-five miles an hour.

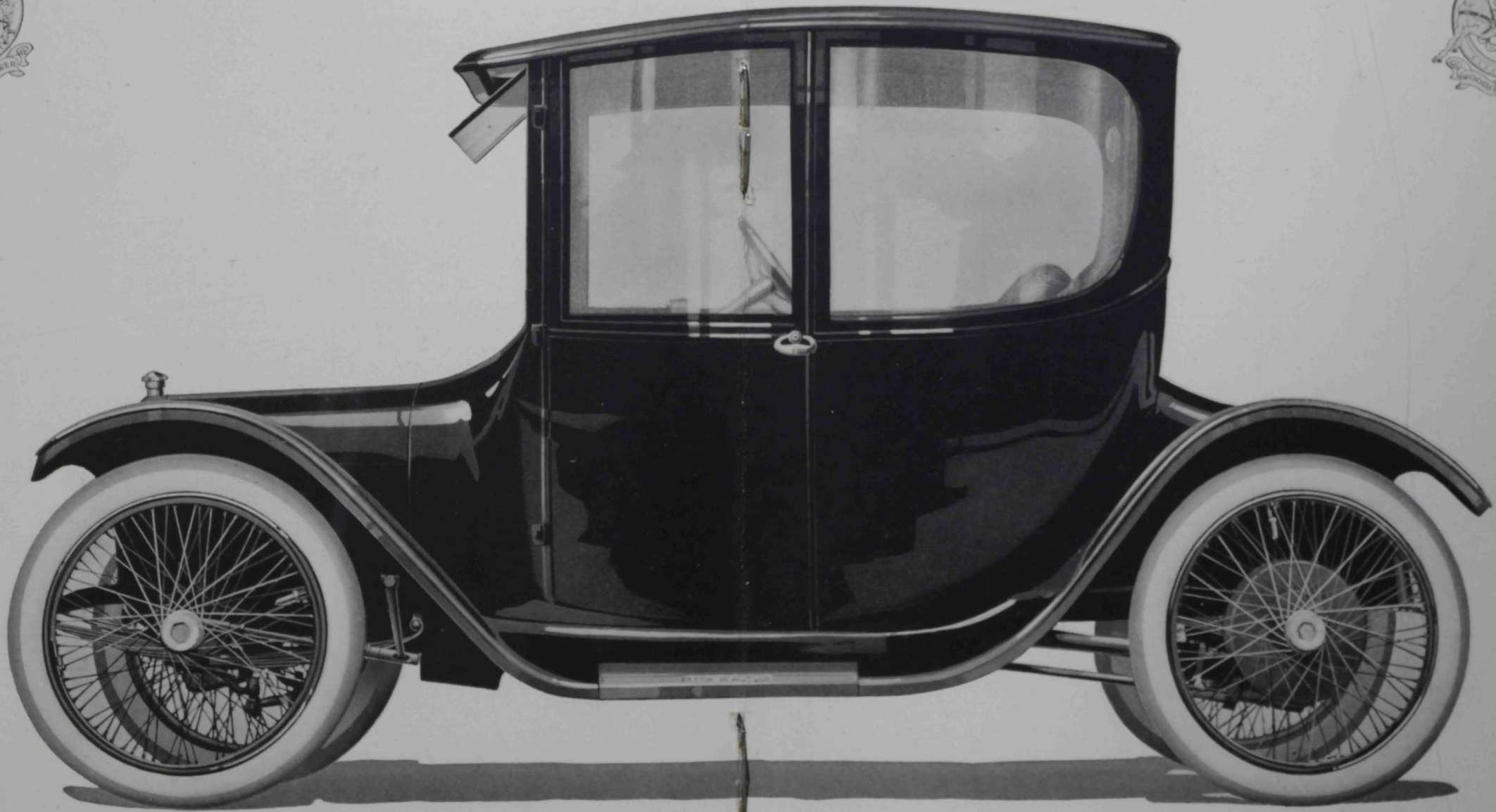


You have perfect control at all times, start instantly, run on any one of an unlimited number of speeds, re-charge the battery while running, brake, stop—all operations either with the movement of a finger on two small levers of the steering wheel or the simple movement of the foot brake pedal. This means the elimination of clutch pedals and gear shifts so that the driver may relax and drive with perfect ease—simplicity itself.

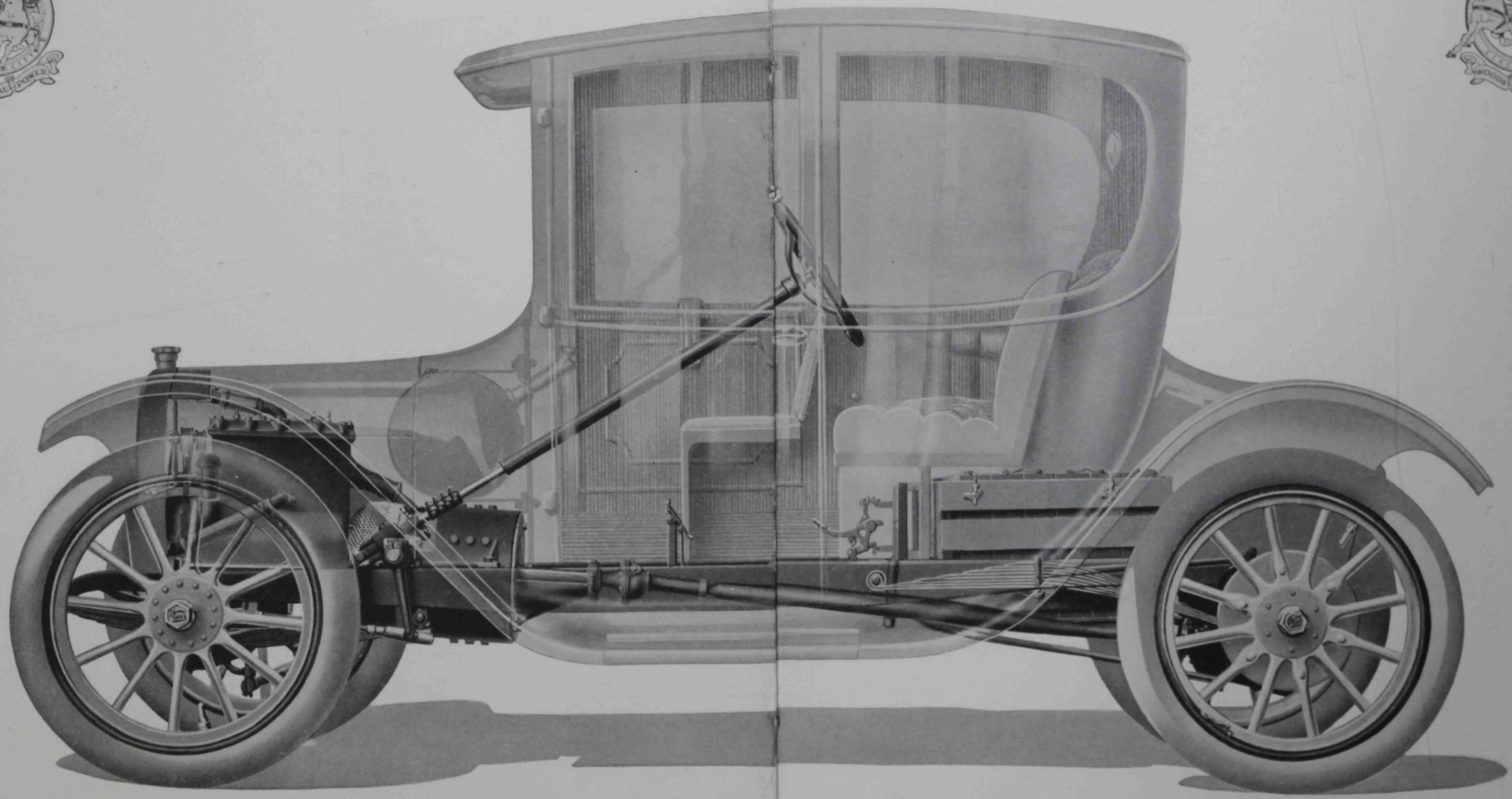
Every detail affecting comfort and convenience has been provided. The body is hung low to make the car ride steadily. The step is low and the door is high and wide to afford ease of entrance. The interior is large and roomy. Ample provision is made for four passengers. The rear seat accommodates three persons. The driver's seat is advanced six inches, allowing elbow room and great freedom in the operation of the steering wheel located on the left hand side. In the right front of the car is a disappearing chair which may be raised to position for a fourth passenger without in any way obstructing the view of the driver.

The upholstery is deep, soft, luxurious, and exceedingly comfortable.





Woods Dual Power, Model 44



Phantom View of Woods Dual Power Showing Salient Features and Simplicity

SPECIFICATIONS FOR WOODS DUAL POWER, MODEL 44

Electric Motor-Generator: Especially wound to develop characteristics required. The liberal proportion of all parts insures quick starting with a minimum of wear.

Gasoline Motor: Four cylinders 2½-inch bore x 3½-inch stroke. Moderate speed guaranteed to develop 14 horsepower. Designed for the service required, having large bearing surfaces and very heavy crank shaft, reciprocating parts being made as light as possible, all of which are carefully balanced to obtain smoothness in operation.

Ignition: Atwater-Kent Type K-2 Automatic Spark Advance System.

Cooling System: Thermo-syphon system with honeycomb type of radiator.

Lubrication: The lubrication of the engine is effected by gear pump, which elevates the oil from the lower chamber to a compartment around the valve tappets from where it flows to the various bearings. Ample lubrication of the connecting rods and pistons is provided.

Gasoline Tank: One piece, located under cowl. Capacity, nine gallons. Gravity feed.

Battery: Woods Special Exide Battery, 24 cells, 11 plates each, of our own approved design and assembly.

Chassis Framing: "U" shaped side members with channel section cross members welded by oxy-acetylene process.

Springs: Front springs half elliptic, Rear spring Cantilever. The high quality of material and skilled workmanship, as well as design, insure the easy riding qualities for which our cars have always been noted.

Wheel Base: 110 inches.

Tread: Standard 56 inches.

Tires: Silvertown Cord 34 x 4.

Wheels: Artillery with No. 52 Stanweld detachable rims.

Axles: Front axle one piece, drop forged I-beam section of special analysis steel and properly heat-treated. All steering knuckles and axle forgings are of steel particularly selected for the work required.

Rear axle — semi-floating type, wheels mounted on driving shafts of special analysis steel which float on Bock roller bearings. Axle tubes are made of swaged steel tubing which flange on the inner end and are bolted to the axle housing

which surrounds a complete unit containing the Baush Hour Glass type of Worm Gear. The brake shaft bearings mounted in this axle are self-lubricating. The axle is trussed to obtain the maximum strength with minimum weight.

Control: Two finger levers on the steering wheel. The outer lever controls the electric equipment and the inner lever, the gasoline equipment.

Brakes: A foot lever provides a powerful dynamic and mechanical brake. See page 21 for full description.

Speed: Maximum speed 35 miles per hour.

Body: Of aluminum panel construction, coupe design. Very wide doors, the glass windows of which may be lowered. The front and rear windows may also be opened. The design of the front window, being of wind shield type so arranged that both upper and lower halves may be adjusted to any angle. See page 11 for seating arrangement.

Trimming: Of exclusive design: Whipcord black and white; leather trimming optional. Painting, blue or green, with wheels in light straw-color.

Equipment: On an illuminated instrument board visible from the driver's seat: Woods Special Ampere Hour Meter and Ammeter Combined. Stewart-Warner Magnetic Speedometer with odometer trip attachment. Three-gang light switches.

On the front dash: Gasoline gauge and robe rail. A full complement of tools in a kit in a compartment back of driver's seat.

A compartment under the rear hood to carry a casing and inner tube not visible from the outside of the car.

A power air pump, mounted on the right hand side of the engine.

An electric motor-driven warning signal. The headlights are equipped with auxiliary bulbs for dim operation.

Price: $2650.00 F. O. B. Chicago.

Extra Equipment: Wire wheels, $25.00; slip covers, $25.00.

Special Cars: We cater to the individual taste of our patrons and will supply cars in special color effects with any kind of obtainable trimmings, in fact, a made-to-order car at $100.00 additional to the list price.

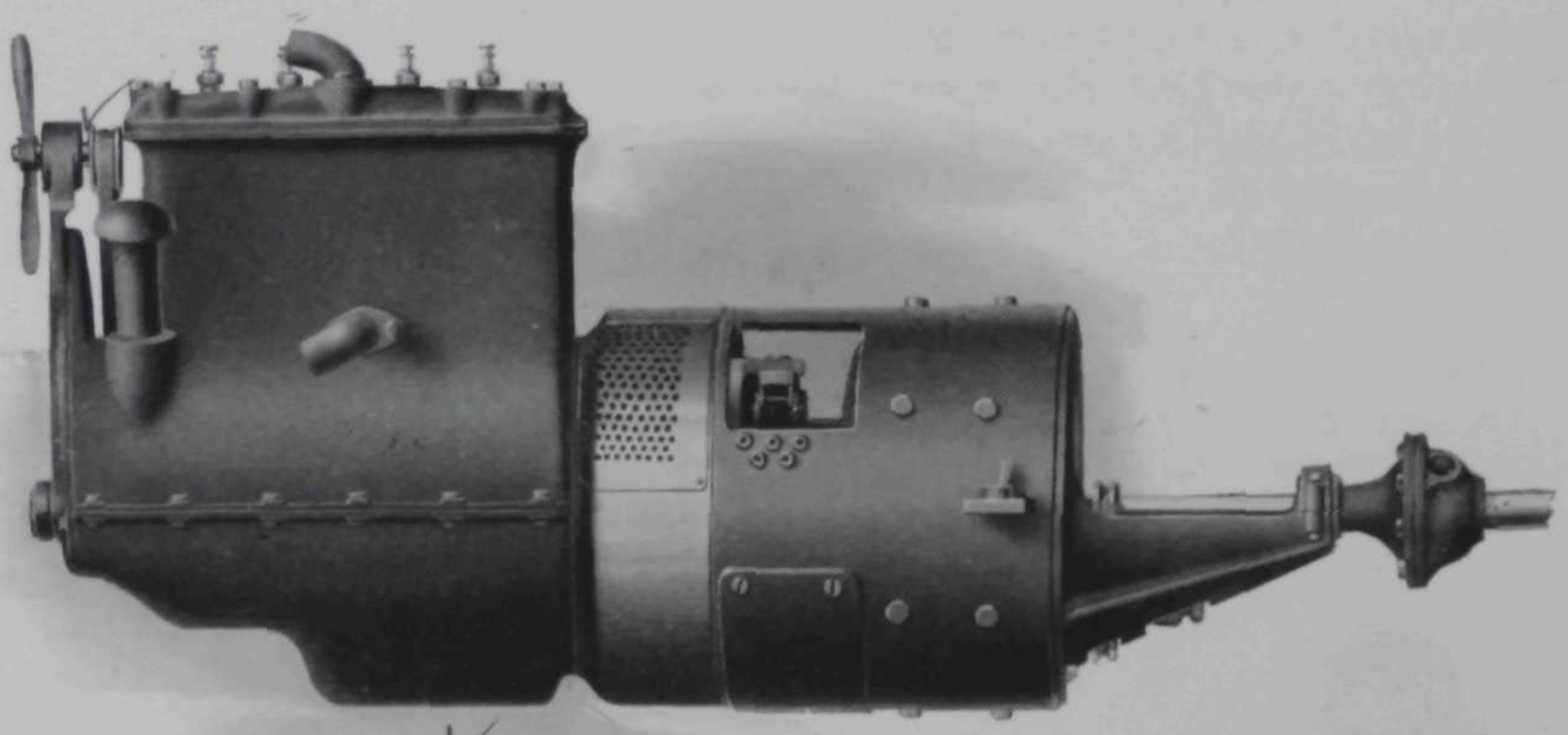
The Woods Motor Vehicle Company reserves the right to make changes or improvements at any time without incurring any obligation to install same on cars previously sold.

$2400

The lines of the car are graceful. Everyone agrees that the design is pleasing to the eye, that the car is comfortable to sit in and consequently easy riding. The bodies are built and fashioned throughout in the Woods factory. The finest coach builders in this country are to be found in our employ. Woods body work is celebrated as the masterpiece of coach building. In beauty, in elegance, in mechanical excellence, in smooth riding, easy control, economy of operation, Woods cars are supreme.

The power plant of the Woods Dual Power consists of a small gasoline motor and an electric motor generator combined into one unit mounted on a three-point suspension. The movement of a finger lever on the steering wheel connects the Gasoline Motor to the Electric Motor Generator which cranks the gasoline motor and develops power which is transmitted through the armature shaft of the electric motor and the propeller shaft direct to the rear axle.

The customary high powered gasoline motor used in so many automobiles is extravagant in the consumption of gasoline but necessary in negotiating hills and roads where a large amount of power is required, although this service repre-



sents less than 5% of the total mileage. Such a gas motor is most efficient when delivering its maximum horsepower resulting in more miles per gallon of gasoline, but under ordinary conditions where a great amount of power is not required it is less efficient and consumes more gasoline per mile.

This is not the case with the Woods Dual Power as its gasoline motor is always operating at its highest efficiency because it is always developing its maximum horsepower, relying upon the electrical equipment to assist in negotiating hills and roads where a greater amount of power is required. The gasoline motor of the Woods Dual Power is large enough for the required performance, small enough to obtain the greatest economy and the method of transmitting the power to the rear wheels insures the greatest efficiency.

It is impossible to stall the Woods gasoline motor because it always develops its maximum horsepower on the speed in which it is running and the additional amount required is furnished by the battery through the electric motor, which makes it absolutely impossible to stall the gasoline motor. Any condition which would cause "stalling" in an ordinary gas car, like overloading the motor, would simply cause the gas motor of the Dual Power to develop its maximum power after which a reduction in speed of the motor would take place. Then the electric motor immediately and automatically comes to the assistance of the gasoline motor and furnishes additional power as required.

Remember that when the gasoline motor is supplying all of the power to operate the car the armature in the electric motor is running at exactly the same speed as the gasoline motor and the electric motor is therefore, without any move-

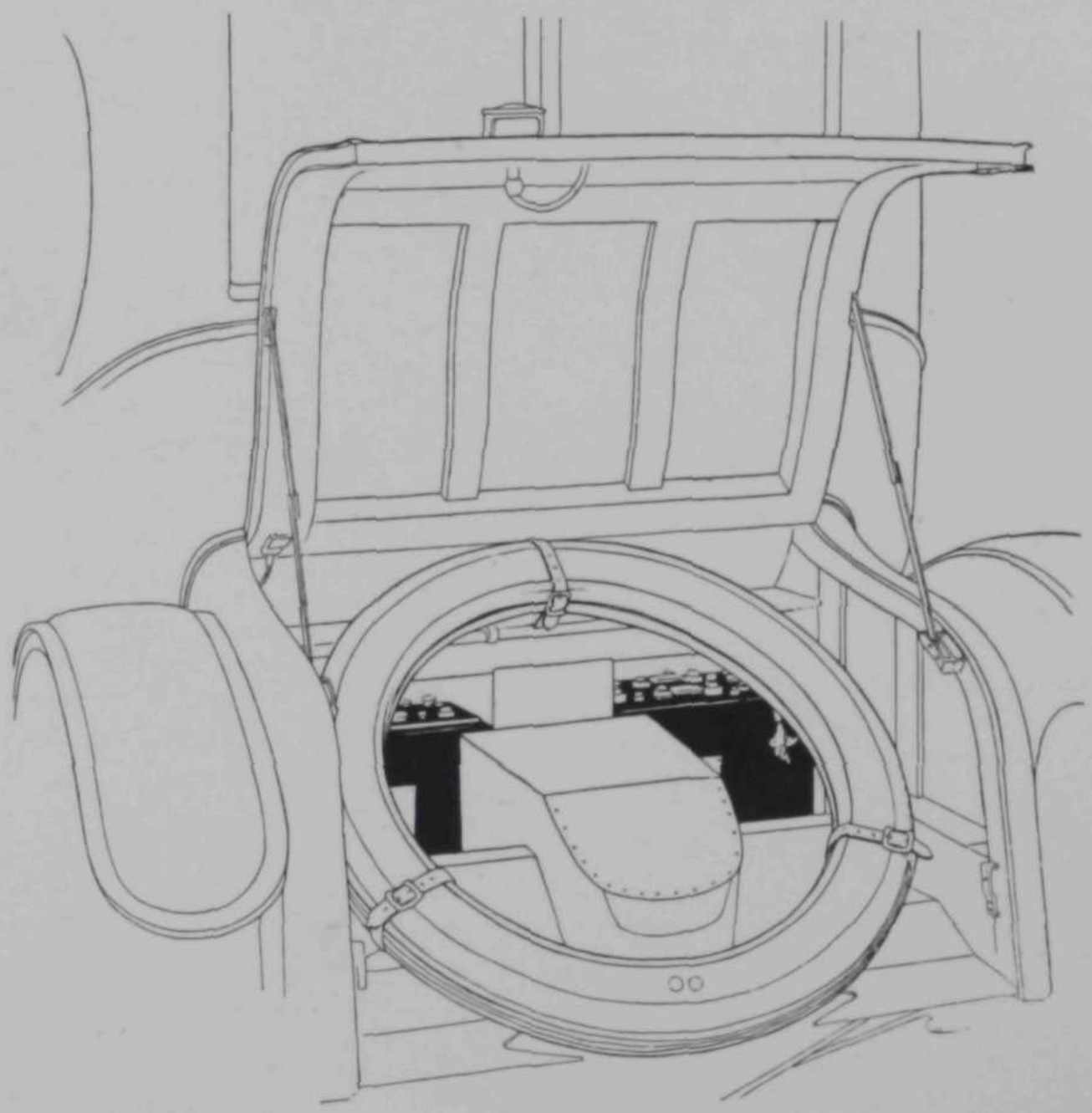
ment of the levers, ready at all times either to run the car independently as an electric car or to assist the gasoline motor to run the car or to serve as a dynamic brake to stop the car.

A very interesting article covering the subject of how to get the maximum efficiency from a gasoline motor has been issued by us. Copy will be mailed to those interested.

This car is equipped with Woods Special Exide battery consisting of 24 cells of eleven plates each. This is a special type designed to meet the unusually high standard of efficiency insisted upon by the Engineering Department of the Woods Motor Vehicle Company.

The battery is designed especially for the service required, guaranteeing greater life and lower maintenance cost.

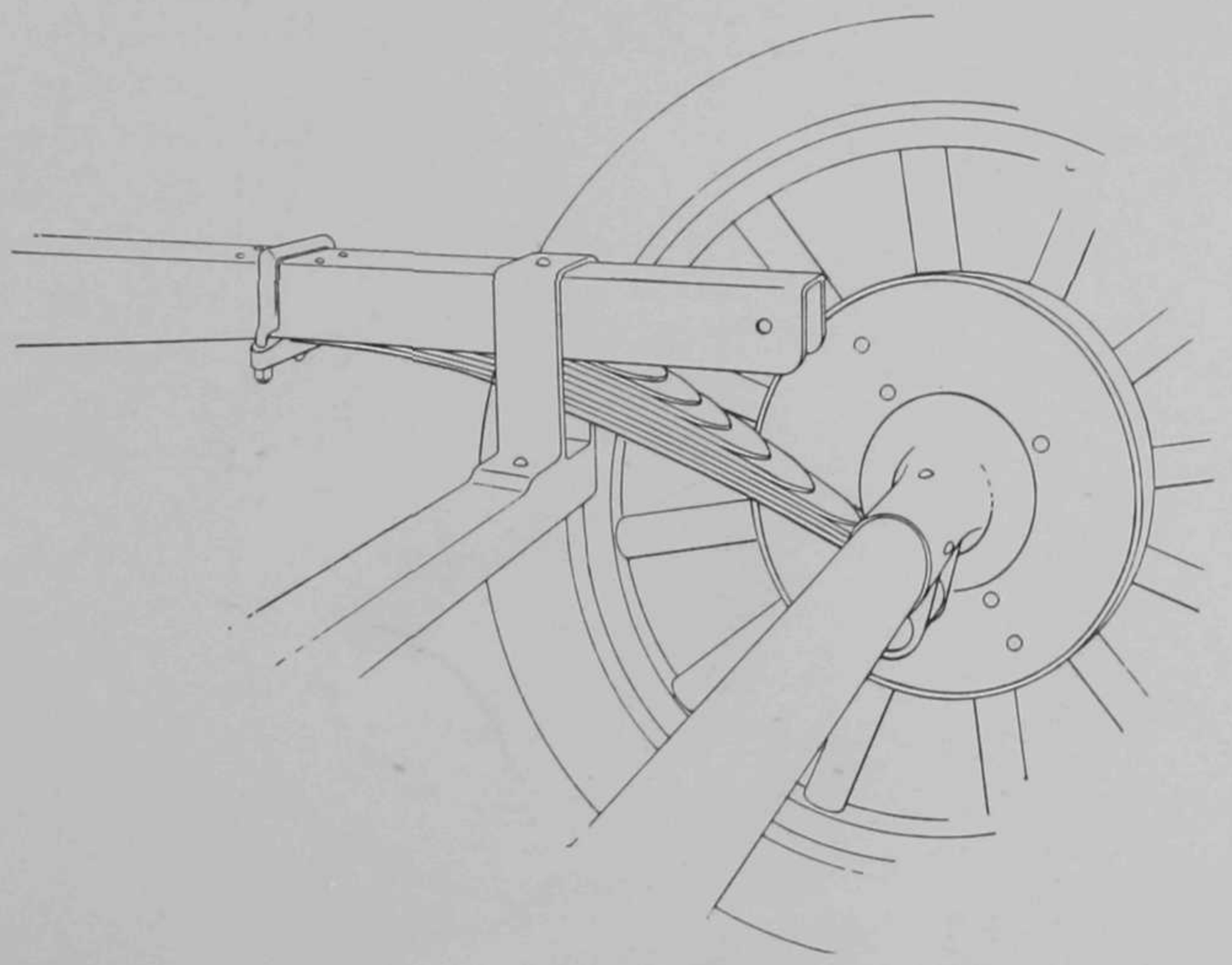
With a slight variation of the relative position of the two levers on the steering wheel the battery may either be charged or discharged at will on



any speed from ten miles an hour up to twenty-eight or thirty miles an hour.

The charging of the battery does not by any means require constant, but only casual attention on the part of the driver and it is always within his control. An indicator on the dash shows the exact condition at all times and also shows whether current is being delivered to or from the battery. Thus it is possible for the state of the battery to be kept within the safety or normal zone, avoiding both gassing and sulphating. The charging and discharging may be done within this zone without regard to rate and with no appreciable harm to the battery. It is the opinion of battery experts that the life of the battery will be several times greater than it ever has been in an electric car.

Dynamic braking may be effected at any speed above six miles per hour by retarding the electric lever. This causes the electric motor to run as



an electric generator driven by the gasoline motor or by the momentum of the car. The power thus generated is used for charging the battery. As the amount of power to drive the generator is increased the greater will be the power required of the gasoline motor or from the momentum of the car and in either case the effect of retarding the car acts as a most effective brake. Retarding the gas lever cuts off the gas and therefore prevents the gasoline motor from maintaining the momentum of the car. The combined result of retarding both levers may be obtained by a simple movement of the foot brake pedal without interfering with either of the finger levers on the steering wheel.

This foot brake pedal as it is advanced farther applies the mechanical brake to the rear wheels in addition to the dynamic brake. The full effect of the dynamic brake is obtained before the mechanical brakes are applied and in emergencies we have the effect of both the dynamic and rear wheel brakes. A detailed description of the braking and charging method as employed in the Woods Dual Power Car is given in a special article, copy of which will be mailed upon application.

The electric equipment is more simple and contains less parts than in the ordinary electric car. There is really no more electric equipment on the Woods Dual Power than on a gas car, but the units are larger and instead of simply turning the engine over a few times for starting it actually operates the car up to a speed of twenty miles an hour, and for a distance of thirty miles or more without regenerating.

Reversing is done entirely electrically by simply placing the left foot on a lever projecting from beneath the heel board. This closes the switch of the magnetic clutch, making it impossible to have current on the clutch when the car is reversed. The electric lever on the steering wheel is then operated in just the same manner as in going forward, or the same result may be obtained by releasing the foot brake pedal, the speed being regulated by the distance the lever or pedal is moved.

Economy is proved from the dollars and cents standpoint. All mechanism is operated under the most favorable conditions, power being transmitted from the two-power unit direct to the rear wheels, thus reducing to a minimum the wearing of working parts. The consumption of gasoline and oil is greatly reduced. The outside charging plant and the cost of current are entirely eliminated, thus effecting a very large saving in maintenance. An enormous amount of time is saved as the car starts instantly, is self-charging and non-stalling. Altogether, in the Woods Dual Power you are offered an irresistible car—one that has no rival in beauty, elegance, and luxurious appointment, a car beyond competition from the mechanical standpoint.

It is at once the car of luxury, the car of service, the car that is always ready, always dependable, the car that is self-regenerative, touching the very bottom of power economy.

Those interested in details of mechanical construction should consult the nearest dealer or write direct to the manufacturer. Special literature is issued covering all phases of the car. Please feel free to ask questions.


Rogers & Company
Chicago - New York