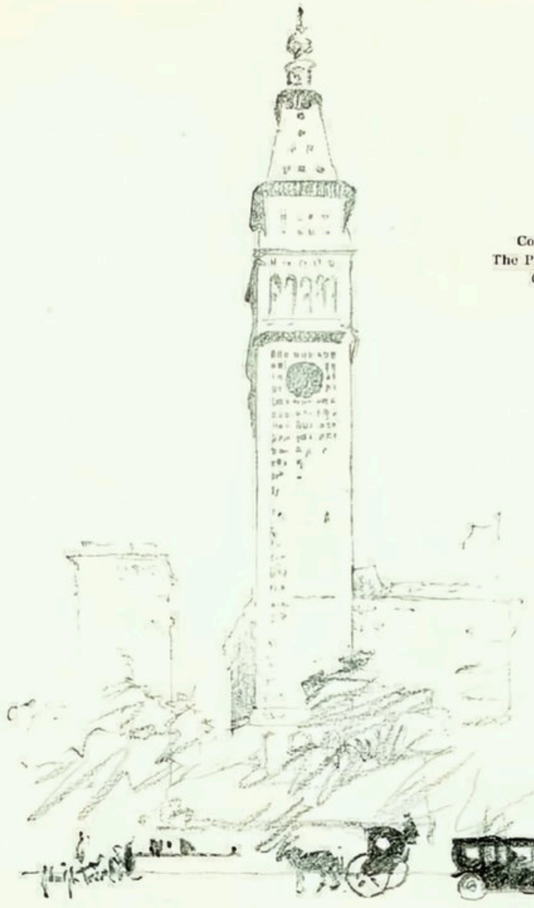
PIERCE-ARROW

PIERCE-ARROW
SIXES

THE
PIERCE-ARROW MOTOR CAR COMPANY
BUFFALO, NEW YORK
U. S. A.

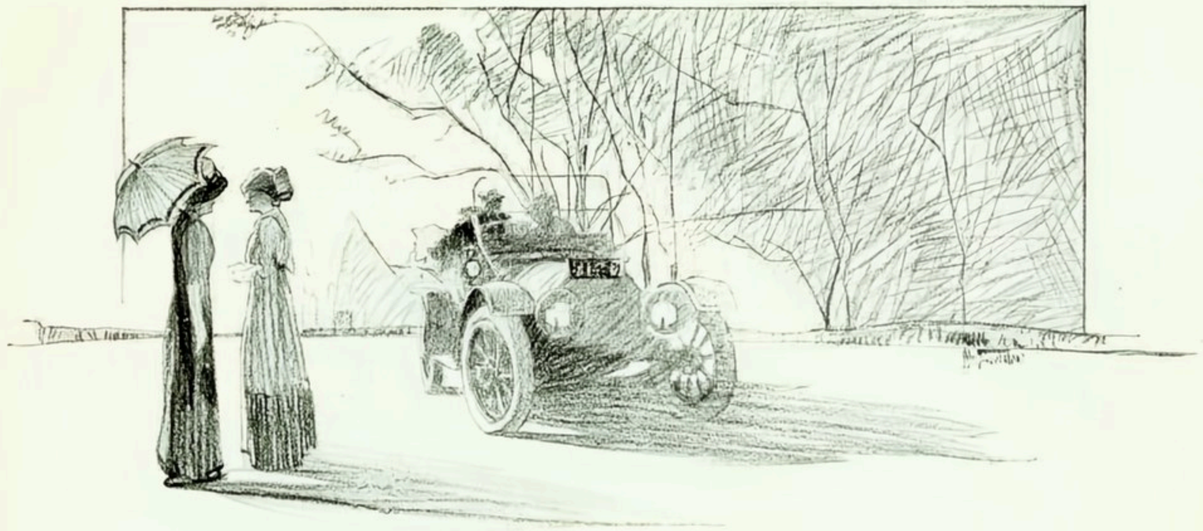


THE PIERCE-ARROW MOTOR CAR COMPANY

SEASON 1911-1912

FOR SALE BY

Boston, Mass. . . . . J. W. Maguire Co., 743-745 Boylston Street
New York, N. Y. . . . . Harrolds Motor Car Co., 233-239 West 54th Street
Philadelphia, Pa. . . . . Foss-Hughes Co., 21st and Market Streets
Chicago, Ill. . . . . H. Paulman & Co., 2420-2422 Michigan Boulevard
San Francisco, Cal. . The Pierce-Arrow Sales Co., 330-340 Van Ness Avenue
Los Angeles, Cal. . . . . William E. Bush, 1227-1229 South Main Street
Portland, Ore. . . . Covey Motor Car Co., Washington Street at 21st Street
Seattle, Wash.. The Motor Car Agency, Inc., S. W. cor. Broadway and Union
Spokane, Wash. . . . The Northwest Auto Supply Co., 1201 First Avenue
Eureka, Cal. . . . . H. A. Hinz
Atlanta, Ga. . . . . John M. Smith, 120-124 Auburn Avenue
Baltimore, Md. . . . . Foss-Hughes Co., 810 North Charles Street
Binghamton, N. Y. . . . . Davidge Motor Car Co., 60 Lewis Street
Birmingham, Ala. . . . . Birmingham Motor Co.
Butte, Mont. . . Silver Bow Automobile Co., Montana and Mercury Streets
Calgary, Alberta, Canada . . . . . McLaughlin Carriage Co.
Cincinnati, O. . The Hanauer Automobile Co., 115-119 East Seventh Street
Cleveland, O. . . . . Weaver-Sealand Motor Co., 1216 Huron Road
Columbia, S. C. . . . . Roddey Auto Co.
Columbus, O. . The Broad-Oak Automobile Co., 621-627 East Broad Street
Corning, N. Y. . . . Corning Automobile Co., Inc., 9-11 East Tioga Avenue
Dallas, Texas . . . . . Eller Motor Car Co., 398 Commerce Street
Danville, Va. . . . . Virginia City Motor Co., 542 Craghead Street
Davenport, Ia. . . . . Mason's Carriage Works, 4th and Perry Streets
Dayton, O. . . . . G. W. Shroyer & Co., 102-106 North Main Street
Decatur, Ill. . . George W. Ehrhart, 209-210 Citizens Title & Trust Building
Denver, Col. . . . . Tom Botterill, 1717-1721 California Street
Des Moines, Ia. . . . . Ryan Motors Co.
Detroit, Mich. . . . . Neumann-Lane Co., 1342-1352 Woodward Avenue
Elmira, N. Y. . . . . Wolcott Motor Car Co., 106-108 West Church Street
Geneva, N. Y. . . . . The Geneva Automobile Co., 145 Castle Street
Grand Rapids, Mich. . . . . Adams & Hart, 47-49 North Division Street
Hartford, Conn. . . . . The Miner Garage Co., High and Allyn Streets
Honolulu, T. H. . Associated Garage, Ltd., Merchant and Bishop Streets
Houston, Texas, . . Houston Motor Car Co., Caroline and Preston Streets
Indianapolis, Ind. . . . . Archey-Atkins Co., 425 North Meridian Street
Jacksonville, Fla. . . . . Winchester Motor Car Co., 309 Main Street
Kansas City, Mo. . . . . Dey-Embry Motor Car Co., 1326 Grand Avenue
Louisville, Ky. . . . . Glenn-Bauer Motor Co., 4th and York Streets
Memphis, Tenn. . . . . Stewart Automobile Co., 205-7-9 Monroe Avenue
Mexico City, D. F. . . Mohler & DeGress, Avenue 16 de Septiembre No. 18
Milwaukee, Wis. . . . . American Automobile Co., 187 Wisconsin Street
Minneapolis, Minn.. Waldref-Odell Motor Car Co.,
1st Avenue, South and 10th Streets
Montreal, Canada. The Motor Import Co. of Canada, Ltd.,
St. Catherine and Atwater Avenue
Nashville, Tenn. . . . . Tennessee Auto Co., 1308-1312 Broadway
Newark, N. J. . . . . Ellis Motor Car Co., 124-126 Washington Street
New Haven, Conn.. The Geo. B. Wuestefeld Co., Temple and Commerce Streets
New Orleans, La. . . The Lyons-Barton Motor Car Co., 748 Baronne Street
Newport, R. I. . . . . Foss-Hughes Co., Casino Terrace
Ogdensburg, N. Y. Hannan & Henry Motor Car Co., 29-31 Catherine Street
Oklahoma City, Okla. . . . Barrett Motor Car Co., 413-415 North Broadway
Omaha, Neb.. H. E. Fredrickson Automobile Co., Inc., 2044-2048 Farnam Street
Pittsburgh, Pa. . . . . McCurdy-May Co., Baum and Euclid Avenues
Pittsfield, Mass. . . . . The Sisson Co., 55-63 West Street
Portland, Me. . . . . F. A. Nickerson Co., 642 Congress Street
Providence, R. I. . . . . Foss-Hughes Co., 18 Snow Street
Richmond, Va. . . . Foster Motor Car Co., Inc., 605-613 West Broad Street
Rochester, N. Y. . . . . Robert Thomson, 258-260 Court Street
Salt Lake City, Utah, The Tom Botterill Automobile Co., 39-42 State Street
San Antonio, Tex. Auto Sales and Supply Co., 109-111 West Crockett Street
San Juan, Porto Rico . . . . . Behn Brothers
Savannah, Ga. . . . . Savannah Motor Car Co., 309 Bull Street
Scranton, Pa. . . . . Standard Motor Car Co., 322-328 Forest Avenue
South America, Lage, McLean & Dreyfuss, 17 Battery Place, New York City
Springfield, Mass.. E. R. Clark Automobile Co., Inc., 461-463 Worthington Street
St. Louis, Mo. . . . . Western Automobile Co., 4701 Washington Avenue
St. Paul, Minn. . . . . Waldref-Odell Motor Car Co., 183 West 6th Street
Syracuse, N. Y. . . . . A. A. Ledermann Co., Rosenbloom Building
Terre Haute, Ind. . . . . Terre Haute Auto Co., 721 South 7th Street
Titusville, Pa. . . . . Keystone Automobile Co., 16 North Franklin Street
Toledo, O. . . . . The Union Supply Co., 231-233 Superior Street
Toronto, Ont., The Automobile & Supply Co., Ltd., 24-26-28 Temperance Street
Troy, N. Y. . . . The Troy Automobile Exchange, Inc., 22-24 Fourth Street
Utica, N. Y. . . . . A. A. Ledermann Co., 231 Genesee Street
Vancouver, B. C. . . A. Walker Automobile Co., 722 Hastings Street, West
Washington, D. C. . The Cook & Stoddard Co., 1313 H. Street Northwest
Wausau, Wis. . . . . Marathon Motor Car Co., 204 Third Street
Wheeling, W. Va. . . . Woodsdale Motor Car Co., On the National Road
White River Jct., Vt.. The Miller Automobile Co., Gates and Currier Streets
Wichita, Kan., The Wichita Automobile Co., Lawrence and William Streets
Williamsport, Pa. . . . . Keeler Motor Car Co.
Wilmington, Del. . . . . Foss-Hughes Co., 1021 Gilpin Avenue
Winnipeg, Man. . . . . McLaughlin Motor Car Co.
Winston-Salem, N. C. . . . . The Motor Co.
Buffalo, N. Y.. The Pierce-Arrow Motor Car Co. (City Sales), 754 Main Street
Paris, France, N. S. Goodsill, Agent (Parts only), 22 Avenue de la Grande-Armee



PIERCE-ARROW STANDARDS

GENERALLY acknowledged supremacy is not the work of a day or a year, but the cumulative result of many years' leadership which compels gradual recognition and emulation on the part of others in the same field. It is not the outcome of claims or arguments but solely the result of years of striving for the attainment of an ideal, counting no effort too great to bring about that superlative degree of excellence which gains recognition upon its merit alone. The development of the Pierce-Arrow Motor Car has represented the attainment of an ideal, the achievement of which has not been hampered by restrictions of cost or time, nor influenced by a passing demand for features most aptly characterized as "talking points". Conservatively designed on a sound engineering basis at the outset, with the maximum factor of safety at every point, every effort has been centered upon maintaining the design and construction in accordance with well-defined standards.

By far the greater part of the work of improvement made in the course of ten years of manufacturing is not apparent to the casual

observer. It has been carried out in the laboratory, the engineering department and in tests on the road and in the shop and the concrete result has been the adoption of but a very small percentage of the proposed changes or devices submitted to test. The process has been one of elimination carried out in "The Factory Behind the Car", rather than on the cars themselves. It has been made at the expense of the manufacturer instead of that of the purchaser. Proposed improvements and changes have been subjected to the test of practical service—frequently for a period extending over two years, and even then have been rejected.

Close adherence to this policy has naturally resulted in the retention of certain features of design and methods of construction which have come to be identified with the Pierce-Arrow Motor Car. Originally regarded as representing what appeared to be an unnecessarily high factor of safety, they have gradually compelled recognition as the Pierce-Arrow standards. While they have come most prominently to the fore as concerning motor design and body construction, equally high standards apply to every part of the machine and to all the material entering into it. Only by the rigid application of such standards to the design and construction as a whole could a motor car so thoroughly well-balanced and so harmoniously proportioned in every detail, be produced.

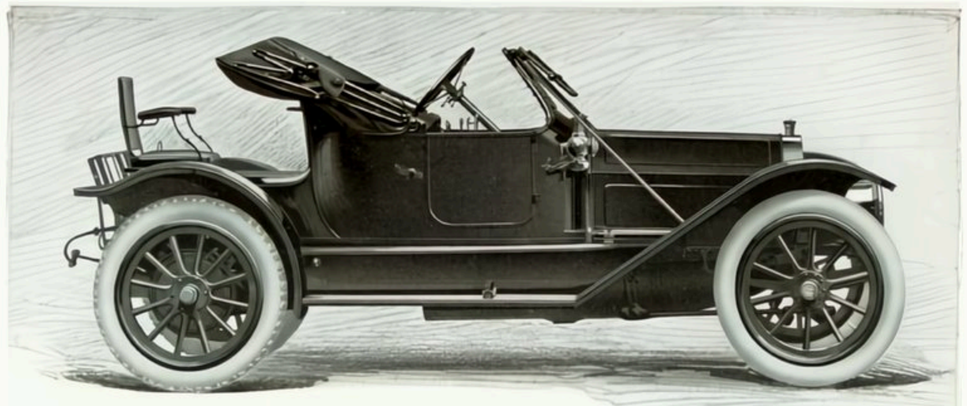
The best evidence of the extent to which the adoption of standards apparently so far in excess of the actual requirements has been justified, is to be found in the record of many Pierce-Arrow Motor Cars turned out in the past ten years and the consistently reliable performance of the great number that are now in daily service. From this, it will be seen that the chief reason for the existence of the Pierce-Arrow standards has been to afford the purchaser the greatest measure of service. To maintain design and construction throughout on a plane that brings closer each year the attainment of the ideal upon which every effort of the entire Pierce-Arrow organization is bent—the building of the perfect motor car.

SIX CYLINDERS

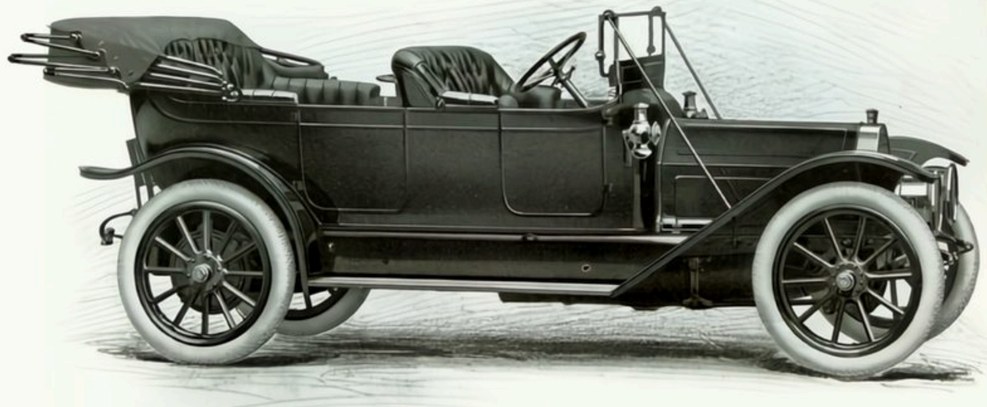
Whether his taste inclines in that direction, or is, in fact, quite the reverse, the purchaser of a motor car finds his interest in mechanics aroused to some extent. Regardless of how little this may be, he will find that there are questions of this nature that he will be called upon to answer for himself when deciding upon the choice of a machine. These naturally do not involve any intricacies of design or construction. They are usually simple and the most important concerns the number of cylinders the motor should have. Seasoned motorists investing in their third or fourth cars judge from the result of their experience and have no hesitancy in deciding for the six. They have been all through the period of transition which marked the adoption of the six-cylinder car several years ago and which was attended by an endless amount of discussion of a more or less technical nature. But the purchaser who is about to make his initial investment in a motor car finds the question a new one for him, and one of the first to be answered.

While apparently one of mechanics, it is really a question of comfort that cannot be answered by any technical consideration of the problem. No amount of knowledge of the advantages or disadvantages of one type as compared with the other will suffice to give any appreciation of the difference between the riding qualities of a six-cylinder car in comparison with one of a lesser number of cylinders. The internal combustion motor as applied to motor car propulsion is a reciprocating engine and the smoothness of its running is entirely dependent upon the evenness of its impulse and mechanical balance. Lack of this balance is productive of unpleasant vibration and it is this that makes the question entirely one of comfort.

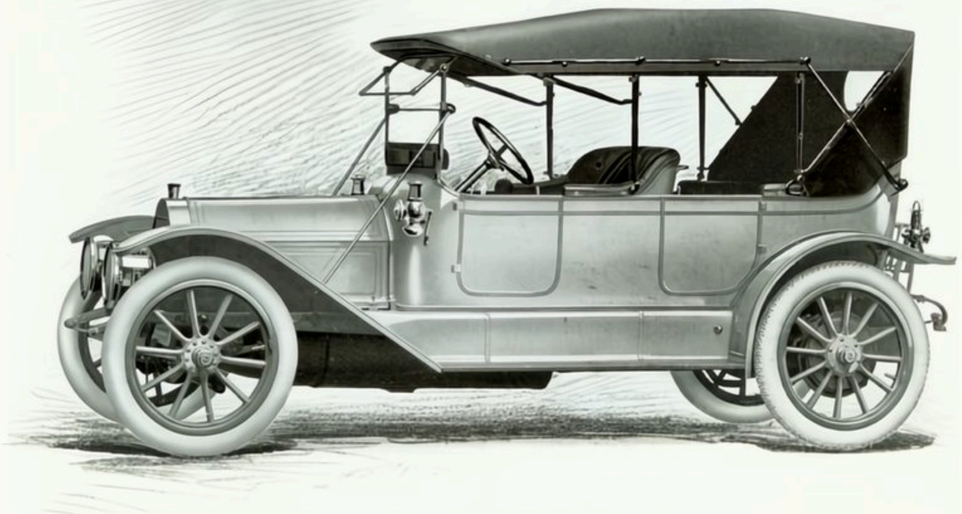
Only by the employment of six cylinders can the balance of the reciprocating parts and of the power impulses of the motor be so perfected as to eliminate this vibration. Its absence explains why you can ride so much further and so much faster in a six-cylinder car without feeling any unpleasant results. You can tour day after



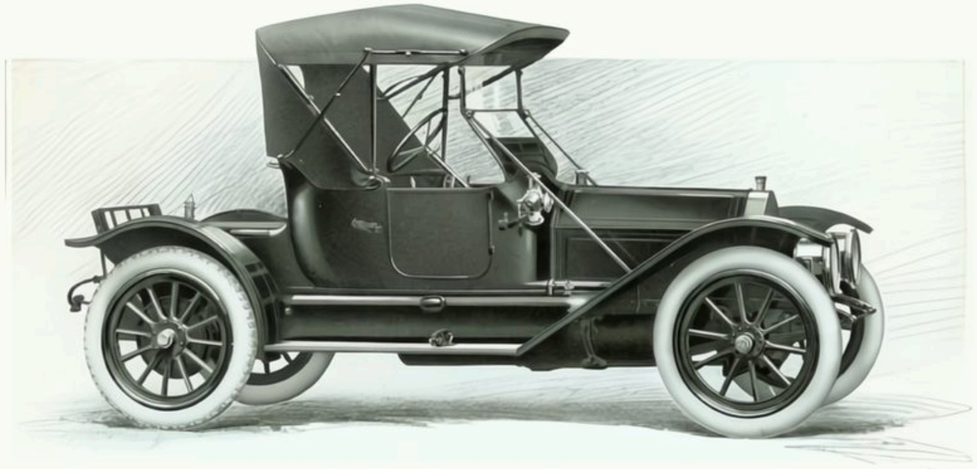
36 Horse-power, Six-cylinder Pierce-Arrow Runabout, seating two persons, with Folding Rumble Seat



36 Horse-power, Six-cylinder Pierce-Arrow Touring Car, seating five persons



36 Horse-power, Six-cylinder Pierce-Arrow Touring Car, seating four persons

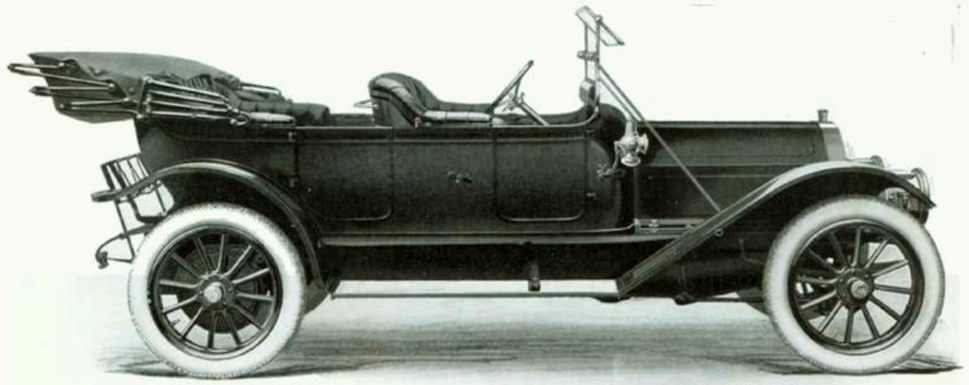


36 Horse-power, Six-cylinder Pierce-Arrow Runabout, seating two persons, with Folding Rumble Seat

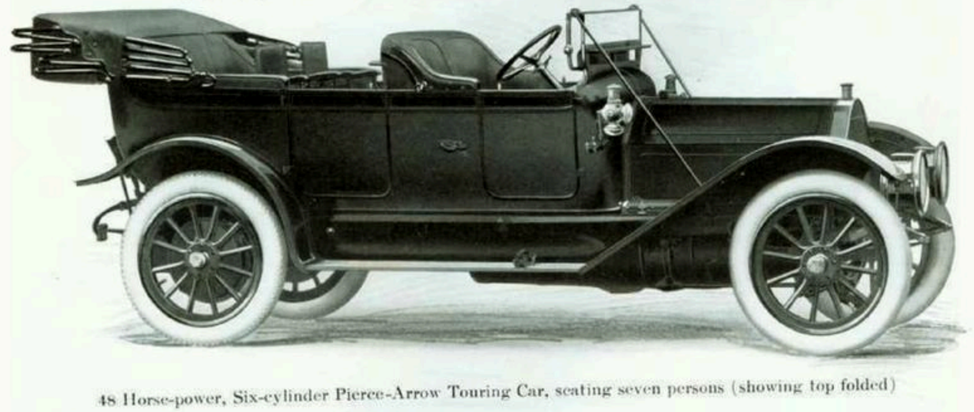
day, over rough roads, without feeling the necessity of stopping over a day from time to time to recuperate. In addition to its excellent balance, the six-cylinder motor delivers its power more uniformly — a succession of rapidly repeated impulses of lesser intensity resulting in smoothly applied effort, which makes acceleration gradual and eliminates all jerkiness in starting or increasing speed. Beside giving greater comfort, this characteristic of the six-cylinder motor has an important bearing upon the operation of the car. It relieves the mechanism and particularly, the tires, of the heavy stresses that are otherwise imposed upon them in starting.

A thorough study and test of the advantages of the six-cylinder car as compared with the four undertaken at an early day, was responsible for the Pierce-Arrow Motor Car Company becoming one of the first manufacturers in this country to place six-cylinder cars on the American market. The success of these first cars was such that a few years later it was decided to devote attention exclusively to the production of six-cylinder cars and this policy has been adhered to ever since. Success has not been merely a matter of the number of cylinders, however, but of the six-cylinder motor car as designed and constructed according to the Pierce-Arrow standards.

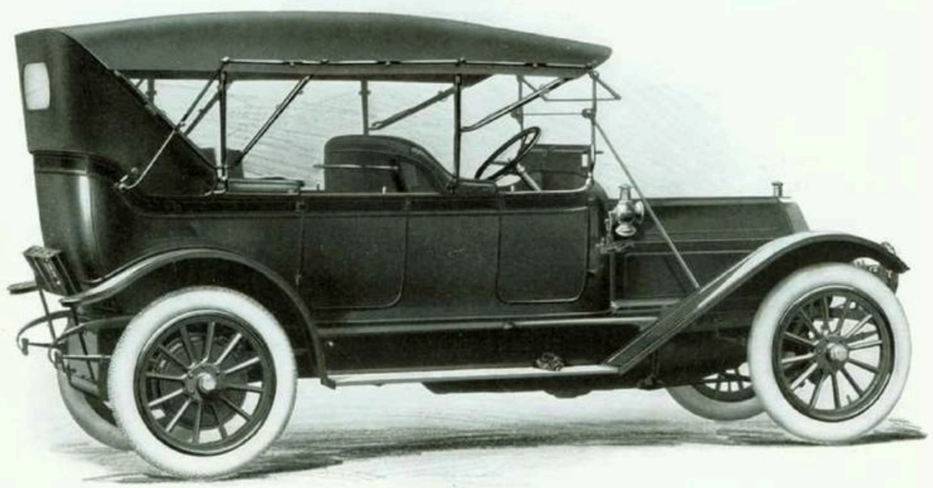
For the season of 1911-1912, the Pierce-Arrow Motor Cars are offered in the following models. Variations in the power and passenger-carrying capacity of the different models have been adopted with a view to meeting as wide a range of demand in these respects as possible. The design and construction in every case, however, are standard, the only differences in the cars themselves being those of dimensions.



48 Horse-power, Six-cylinder Pierce-Arrow Touring Car, seating five persons



48 Horse-power, Six-cylinder Pierce-Arrow Touring Car, seating seven persons (showing top folded)



48 Horse-power, Six-cylinder Pierce-Arrow Touring Car, seating seven persons (top in place)

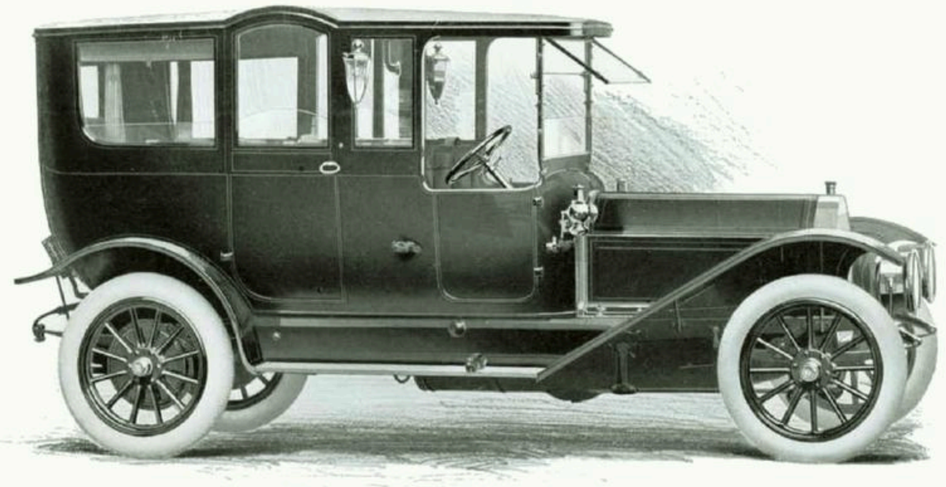
PIERCE-ARROW MODELS

THIRTY-SIX HORSE-POWER

Runabout. Two passengers with disappearing rumble seat
Four-passenger Touring
Five-passenger Touring
Five-passenger Brougham
Five-passenger Landaulet

FORTY-EIGHT AND SIXTY-SIX HORSE-POWER

Runabout. Two passengers with disappearing rumble seat
Four-passenger Touring
Five-passenger Touring
Seven-passenger Touring
Seven-passenger Suburban
Seven-passenger Landau
Seven-passenger Vestibule Suburban
Five-passenger Brougham
Five-passenger Landau
Special Touring Landau, seating seven persons



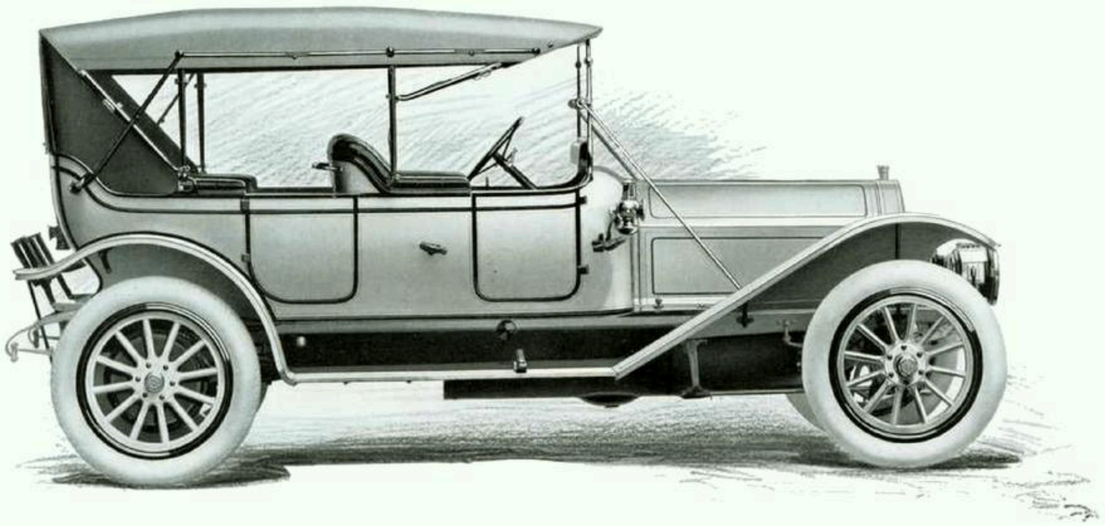
66 Horse-power, Six-cylinder Pierce-Arrow Suburban, seating seven persons

HARMONY OF DESIGN

The motor car body has long been a heritage from the days of the carriage builder. Its lines have been hampered by the tradition and precedent of years' standing, and its development, particularly where closed bodies are concerned, has not kept pace with that of the motor car itself. To a great extent, this is an outgrowth of the result of concentrating attention on the production of the chassis alone. Certain features of construction and ornamentation have accordingly been closely retained, not because they have been found either necessary or appropriate, but simply because they have represented common practice for many years.

To insure that harmony of design between the chassis and the body that makes of the completed machine a well-balanced unit, it is essential that equal attention be devoted to the latter. It is not sufficient that it should merely conform to the chassis lines, nor does it fulfill its role simply by affording comfortable accommodation for its passengers. Tradition has been binding to an extent that has made the average closed motor car body nothing more than an adaptation of carriage-building practice, just as the first motor cars were merely "horseless carriages".

A realization of the shortcomings of this method was responsible for the establishment of a special department in "The Factory Behind the Car" three years ago. Pierce-Arrow bodies have always been designed and built in the Pierce-Arrow plant, but it was felt that something more than the satisfactory execution of the mechanical detail alone was necessary to produce motor car bodies that should be thoroughly in keeping with the chassis for which they were intended. The body-building plant was accordingly supplemented by a department devoted to matters of design, fabrics, and color schemes, special study being devoted to bringing about harmony of design in every detail. This has resulted in the creation of original patterns for the fittings, metal parts and the lamps, which have thus been along distinctive lines specially designed to harmonize with the Pierce-Arrow bodies. It has also made it possible to cater to individual taste in the finish and equipment of this important essential of the Pierce-Arrow Motor Cars, and many purchasers have availed themselves of the services of this department for the creation of distinctive color schemes since its inauguration.

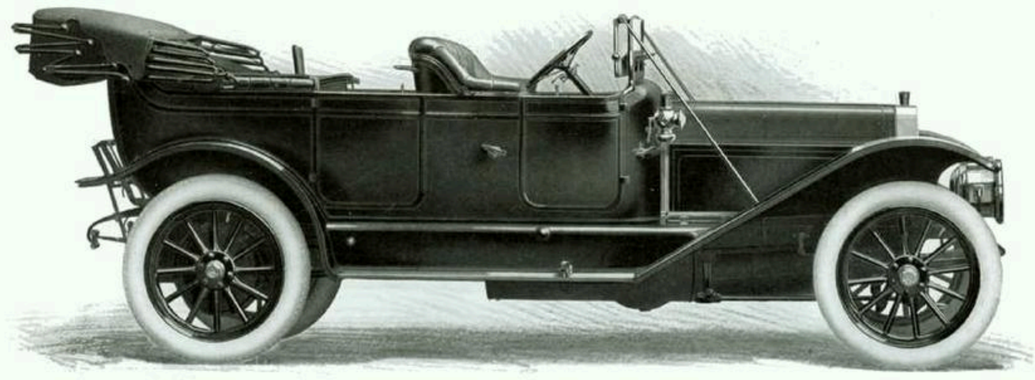


66 Horse-power, Six-cylinder Pierce-Arrow Touring Car, seating five persons

As the result of a painstaking study of the whole question of body design and its relation to the chassis, undertaken some time ago, an entirely new and original set of body designs has been prepared for the Pierce-Arrow Motor Cars for the season of 1911-1912. This involved the abandonment of a large and costly equipment of patterns in addition to the great amount of work entailed in preparing others, but the outlay is more than justified by the result as exemplified by the new Pierce-Arrow bodies. In their design, the tradition and precedent which represent a legacy of many years of carriage-building practice, have been entirely disregarded and the bodies in every case have been planned to conform to the requirements of the motor-driven vehicle—in other words, to become practically an integral part of the chassis.

The object has not been merely to get away from precedent, nor, on the other hand, simply to create body designs that would be distinctive for the sole reason that they are different. There has always been a certain lack of harmony between the requirements of the motor car and the manner in which they have been met by those whose experience has been founded entirely upon the carriage-maker's idea of the fitness of things. It has accordingly been with a view to making Pierce-Arrow bodies quite as distinctive a part of the design as are the various features of the chassis itself, that the carriage-maker's practice has been departed from.

The conditions of service under which carriages and motor cars operate are radically different, that of the latter naturally being much more severe. This has been given due consideration in the new designs, and all excrescences or projections have been eliminated, making the bodies perfectly smooth on the outside and keeping the running boards clear. Fore doors are provided on all models, whether open or enclosed, and the operating levers have been placed inside in every case. Ample space has been allowed between the levers and the door, the front seat being made wider to insure plenty of room for conveniently handling the control.



66 Horse-power, Six-cylinder Pierce-Arrow Touring Car, seating seven persons

While the lines of the new Pierce-Arrow bodies have not been dictated by fashion, the value of beauty in the finished design has not been lost sight of for a moment. They are ethically correct, though none of the new features has been incorporated merely for the sake of appearance.

Beauty and utility in a body designed and constructed particularly with the requirements of the mechanically propelled car in view have been the objects sought. While beauty of outline has not been subordinated in any way, utility has been emphasized, making the body more typical of the great value of the motor car for rapid and comfortable transportation. Pierce-Arrow enclosed bodies are distinguished by arched doors, which add greatly to the beauty of their contour, beside providing increased head room.

The same high factor of safety followed in the construction of every part of the chassis, applies to Pierce-Arrow bodies as well. Attempting to keep the weight down to unreasonable limits by ignoring the fact that it is quite as essential to have a durable body as it is to have a well-built chassis, would be a short-sighted policy. Pierce-Arrow bodies are made as light as they can be, consistent with due conformity at every point with the Pierce-Arrow standards of construction. Nothing that will contribute to comfort or luxury has been omitted in the equipment.

Cast aluminum is employed as the foundation of all Pierce-Arrow bodies and the castings are so patterned as to form each part of the body as a unit. They are among the largest that the founder can practically cast in this metal as a single piece. Not alone the employment of an aluminum alloy in this form but the use of such large and intricate single castings greatly increases the cost. Joints and other sources of weakness are eliminated, the aluminum castings being reinforced with a substantial framing. This makes a body of moderate weight that is as durable as the car itself.

While certain standard designs have been adopted for Pierce-Arrow bodies, the individual taste and requirements of the purchaser are consulted in every instance.

TIRES AND EQUIPMENT

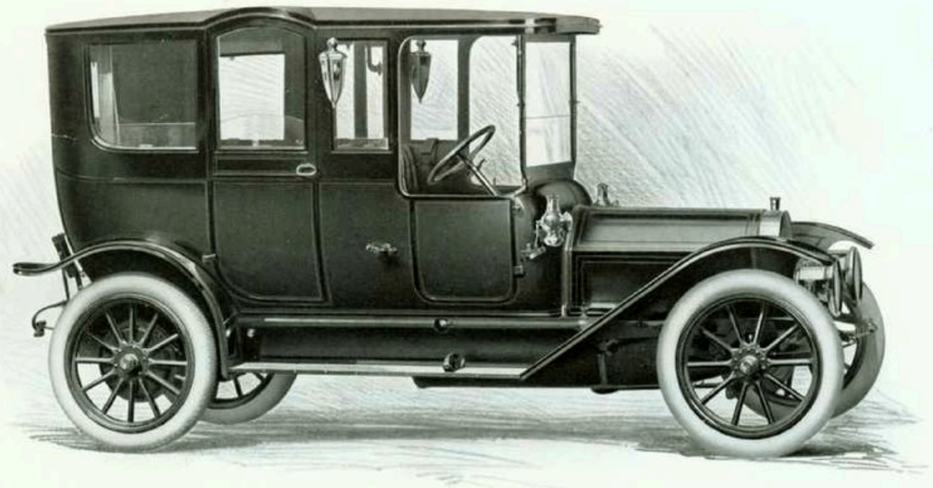
Comfort in a motor car will be lacking if the passengers are subjected to constant vibration or to undue jolting. In the Pierce-Arrow motor cars, the most serious of these causes of discomfort — constant vibration — is eliminated by the solidly built and perfectly-balanced six-cylinder motor. A well-worked-out suspension, employing three-quarter elliptic springs at the rear, absorbs sudden shocks, the recoil of the springs being taken care of by the Truffault-Hartford shock absorbers. But too much stress cannot be laid upon the influence of the tires — not merely for a smooth-riding machine, but likewise the freedom from annoyance that only a liberal tire equipment can provide.

It is quite as important that the tire equipment be considered from the purchaser's point of view in the original design of the car, as it is that every other part of the chassis receive the attention that it deserves. Failure of the mechanism reflects upon the manufacture of the motor car itself, but expense and annoyance from the tires does not carry with it the same discredit. This led to the practice of specifying sizes whose carrying capacity equalled the weight of the chassis, or, at best, the empty car.

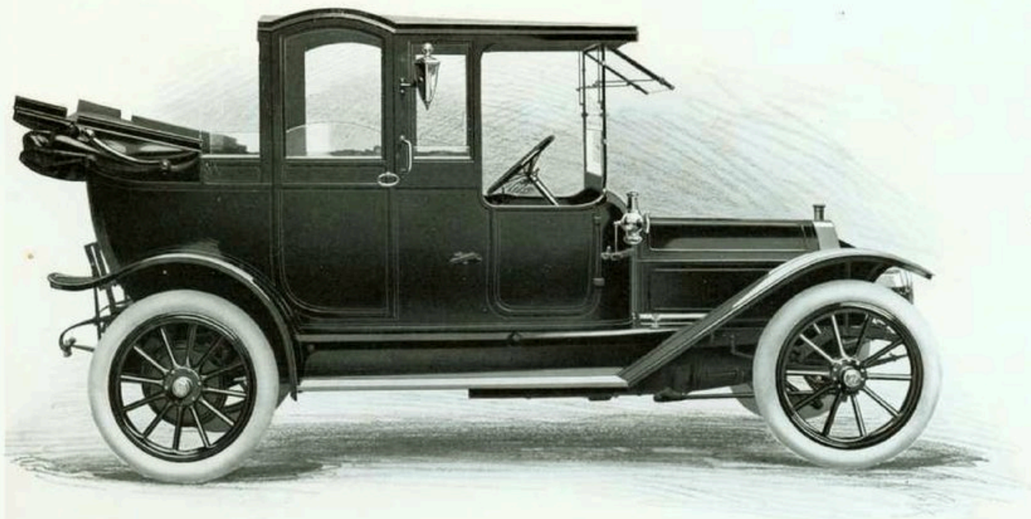
To minimize initial tire costs, chassis weights have been kept down to a point which experience has demonstrated is well below what is practical. Constant failures have been responsible for a steady increase in tire sizes from year to year, and this tendency is still in evidence. This is a bit of history with which every observing motorist whose experience has extended through the period in question will be familiar. It emphasizes the Pierce-Arrow policy by contrast.

We considered it necessary to make a more liberal allowance for the severity of the stresses to which a motor car is subjected to in service, than was ordinarily regarded as practical. This meant additional weight, regardless of the cost or the fine quality of the material itself. The Pierce-Arrow chassis was accordingly made heavier at the outset, because conservative engineering opinion deemed it necessary to produce a car that would last. No Pierce-Arrow car has ever worn out in legitimate service. After several years of pleasure service, a great many of them are to-day providing efficient and economical light delivery service.

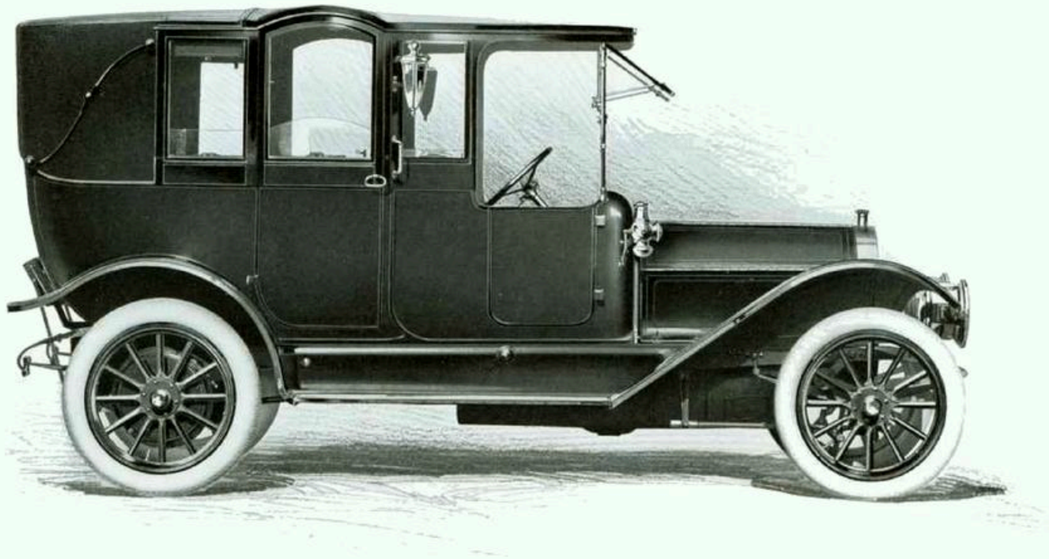
So much for the Pierce-Arrow standard of durability. It does not require any intricate calculations to demonstrate what a very substantial percentage of the total



36 Horse-power, Six-cylinder Pierce-Arrow Brougham, seating five persons



36 Horse-power, Six-cylinder Pierce-Arrow Landaulet, seating five persons



48 Horse-power, Six-cylinder Pierce-Arrow Landau, seating seven persons (closed)

48 Horse-power, Six-cylinder Pierce-Arrow Landau, seating seven persons (open)

weight of the machine in running order is represented by the fuel, water, oil, batteries, tools, etc., plus that of the passengers. In the case of a seven-passenger car, it may easily exceed one-third the weight of the empty car itself.

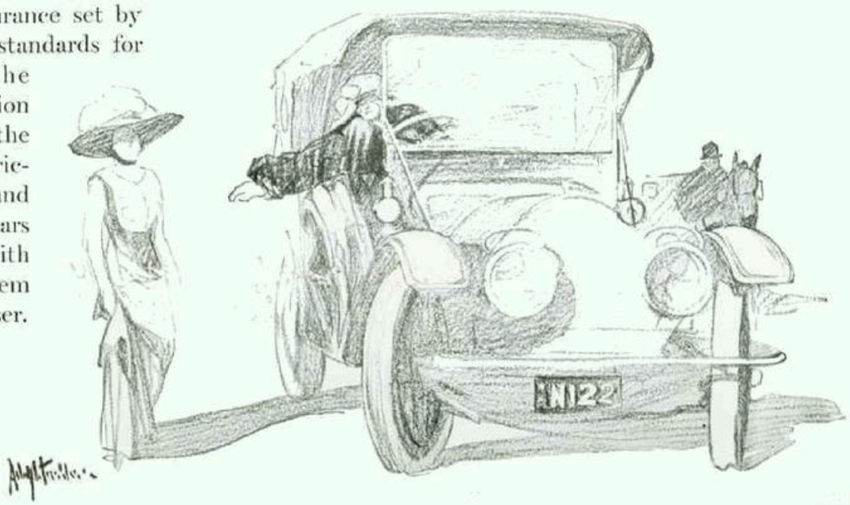
This was given full consideration and ample margin was then allowed in addition, when specifying Pierce-Arrow tire sizes, in order to allow a liberal factor of safety. All models of the 36 horse-power car are fitted with 36 by 4½-inch tires all round. In the 48 horse-power type, the runabout is fitted with 36 by 4½-inch tires all round. All other 48 horse-power cars are fitted with 37 by 5-inch tires front and rear. The 66 horse-power runabout model is fitted with 37 by 5-inch tires all round ; all other cars of this power with 37 by 5-inch tires front and 38 by 5½-inch tires rear.

That these are ample proportions to bear the loads so that the tires may legitimately wear out in service and give the maximum mileage, instead of being blown to pieces at an early period in their career by being overburdened, is well attested by the hundreds of authentic records of Pierce-Arrow tire mileages.

EQUIPMENT

To provide the maximum comfort and convenience in a motor car, there are a number of fittings and accessories which are indispensable. The car is not complete without them. They are not extras in any sense of the word and should not be charged for as such, though this has been the custom. In this category are tops, windshields, shock absorbers, power air pump for inflating tires, and Prest-O-Lite tank. Every effort has been devoted to making the Pierce-Arrow Motor Cars as complete as possible and ready to run, as delivered to the purchaser. All models are accordingly equipped with the items mentioned in addition to the more customary accessories, such as oil and electric side and tail lamps, gas headlights, storage battery for electric lighting, rear number electric lamp, horn, full set of tools, gasoline gauge, Pierce-Arrow carbureter primer for easy starting, odometer, tire carriers, trunk rack, robe rail, folding foot rest on touring and enclosed cars, sprag (except on the 36 horse-power models), trunk rack and Yale locks on the hood, dash cabinets, tool compartments and oil and grease box.

After thorough consideration of the electric-lighting systems at present on the market, it has not been considered expedient to adopt this feature for the present models. Electric lighting will undoubtedly become universal on the motor car during the next few years, but in its present state, the art has not developed to a point that is on a par with the high degree of reliability and endurance set by the Pierce-Arrow standards for other parts of the mechanism. Provision has been made for the installation of electric-lighting systems, and at an extra cost, cars will be equipped with any suitable system selected by purchaser.



DESIGN AND CONSTRUCTION

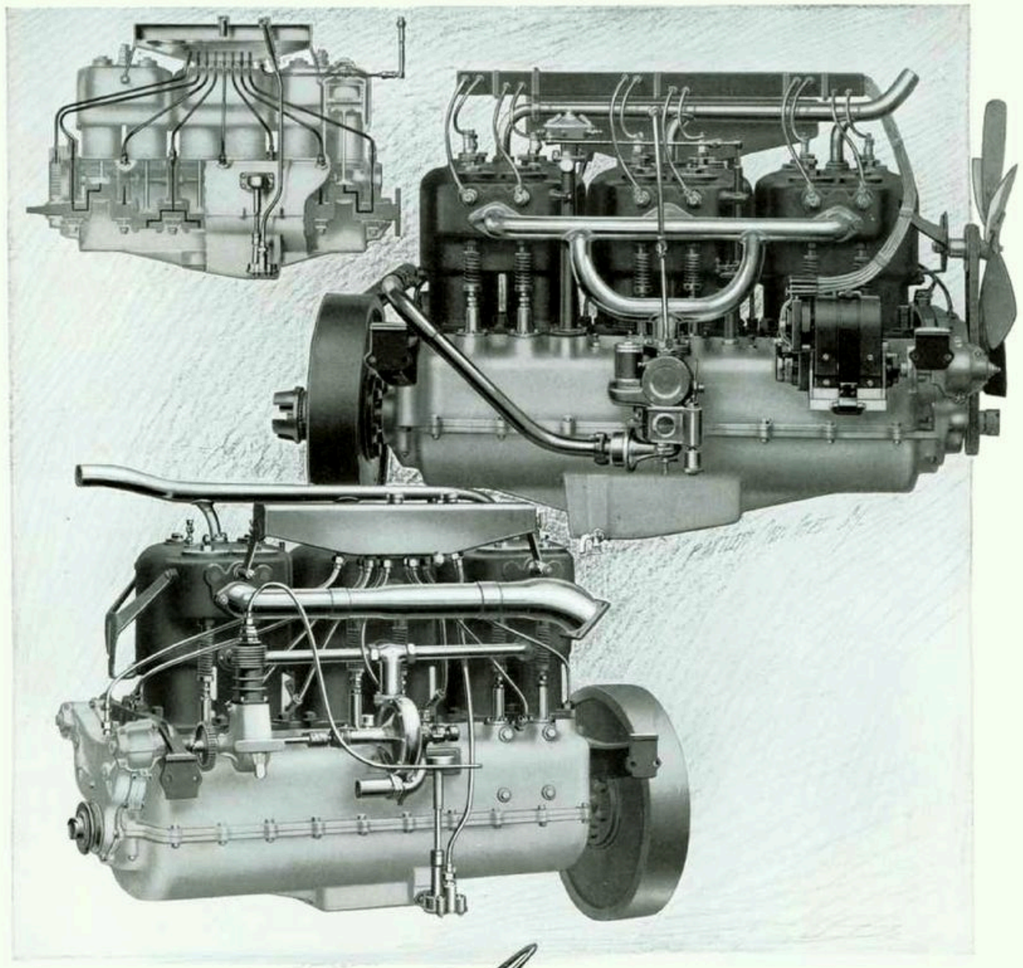
Pierce-Arrow standards have become so firmly established through years of adherence to the basic design of chassis adopted at the outset that the necessity for change from year to year has been minimized. A thorough-going policy of testing proposed improvements to destruction on experimental cars and in the laboratory, has made it unnecessary to try them out at the expense of the purchaser.

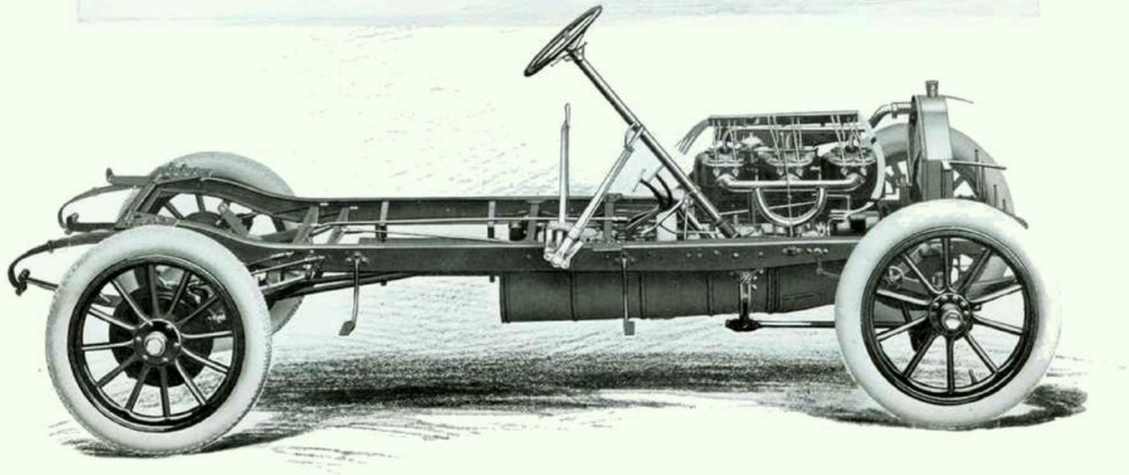
MOTOR All Pierce-Arrow motors are of the six-cylinder type, and while they are built in three sizes—36, 48 and 66 horse-power, the design throughout is the same in every case, the differences being simply those of dimensions. The cylinders are cast in pairs from specially selected, close-grained iron and have ample provision for cooling; the castings are all subjected to a hydraulic test for tightness after machining. Pistons and piston rings are cast from the same grade of iron as the cylinder. The connecting rods are one-piece drop-forgings, working on hollow steel wrist-pins in the piston and on journals of unusually liberal dimensions at the big ends. The reciprocating parts of each group of cylinders are accurately balanced.

Ability in a motor is largely determined by its crankshaft and this in turn depends to a great extent on the solidity of its support. When six-cylinder motors were first introduced, the precedent established by the four was commonly followed and only four bearings were provided. But the impulse of the automobile motor is in the nature of a blow and unless the points of support are close together the crankshaft is subjected to bending stresses which causes vibration and are bound to cause breakage sooner or later.

Pierce-Arrow six-cylinder motors have accordingly always been provided with seven liberal bearings. For some time after its adoption this was generally regarded as being entirely superfluous. But nothing short of this would comply with the Pierce-Arrow standard and the wisdom of going to this apparent extreme is justified by the freedom of the Pierce-Arrow motors from the vital defect of crankshaft breakage.

The crankshaft itself is a one-piece drop-forging of alloy steel machined all over, ground to the closest practical limits on the journals and accurately balanced. It is





Oiling System, Inlet and Exhaust Side of Pierce-Arrow Six-cylinder Motor, showing Carbureter, Magneto and Tire Pump
Standard Pierce-Arrow Six-cylinder Chassis complete

supported by a liberal-sized bearing between each cylinder and extra long bearings at the front and the fly wheel end. The journals and crankpins are of unusual diameter, these parts being made hollow to reduce weight and to detect faulty material.

The bearings for both the crankshaft and the camshafts are attached to the upper half of the crankcase, which is a casting of special aluminum alloy. The same material is employed for the lower half of the crankcase, which merely acts as a pan to collect the flood of oil pouring over the bearings. This oil pan can readily be dropped, exposing all the bearings for inspection. While the aluminum alloy employed for the crankcase is of high tensile strength, it is not relied upon to support the motor. Special drop-forged steel supporting arms are employed instead and the crankcase is attached to these arms by long through bolts. At their outer ends the arms are bolted directly to the side members of the frame. When first introduced this was likewise a radical departure from the practice of employing cast aluminum supporting arms that was regarded as unnecessarily safe but like other Pierce-Arrow standards of construction, it has since compelled recognition of its worth.

LUBRICATION With the high speed and compression employed in the modern automobile motor, lubrication is paramount. If it had never set an unusually high standard in any other respect, the Pierce-Arrow lubricating system would in itself be sufficient to distinguish the Pierce-Arrow motor. Its purpose is not merely to supply an ample quantity of oil to the bearings, but to keep them flooded as long as the motor is running. As far as can possibly be done, the human equation has been eliminated. Given a renewed supply of oil every two hundred and fifty miles, it is entirely automatic in action.

It consists of but four essentials—a tank for the supply, an oil pump, the feeds to the bearings and the oil pan of the crankcase. The tank is fastened to the exhaust side of the motor, where the supply of oil is kept at a uniform temperature, and it is so designed that the feed cannot be disturbed in ascending or descending grades. This holds the supply of oil, which is fed directly by gravity through large bore copper tubes to the seven main bearings. From these it enters the drilled-out passages of the crankshaft which conduct the lubricant to the crankpins. Both the tubes and the passages are of such liberal diameter that the oil is not fed to them in the ordinary sense of the term, but is kept pouring over them.

The supply that reaches the wrist-pin and cylinder walls is so generous that baffle plates are employed to prevent the excess finding its way to the combustion chamber. No dependence is placed on splash from the connecting rod ends for this purpose, the oil pouring over the bearings being led directly to a chamber in the bottom of the crankcase. The oil pump, driven by spiral gearing from the exhaust camshaft, is located in this chamber and serves to return the oil to supply tank as fast as it is fed by gravity from the latter. This pump is of the gear type so that it cannot clog while both the intake and all the outlets from the tank are protected by easily removable fine wire gauze screens, so that the lubricant is strained every time it is circulated. An independent feed is provided for the timing gears.

CARBURETER Experience has demonstrated that to achieve the greatest degree of efficiency and reliability it is essential that every part of a motor be designed especially for it. For this reason, the Pierce-Arrow carbureter

has not only been designed with special reference to the characteristics of the motor, but it is made throughout in "The Factory Behind the Car". It embodies features that are the result of several years' study of the problem of automatically altering the proportion of air to fuel with increasing demands upon the motor.

Instead of the usual diaphragm or dash-pot arrangement which involves delicate devices for its control, the auxiliary air inlet consists of a cylindrical chamber with rectangular ports of equally sized dimensions. Each of these is covered by a spring brass plate or reed of varying size and tension completely covering it when at rest. As the atmospheric depression caused by increasing the speed of the motor is augmented, these reeds are pulled away from their ports, opening the latter consecutively in the order of their strength. The carbureter is water-jacketed and supplied with warm air from the exhaust manifold to economically utilize low grade fuel.

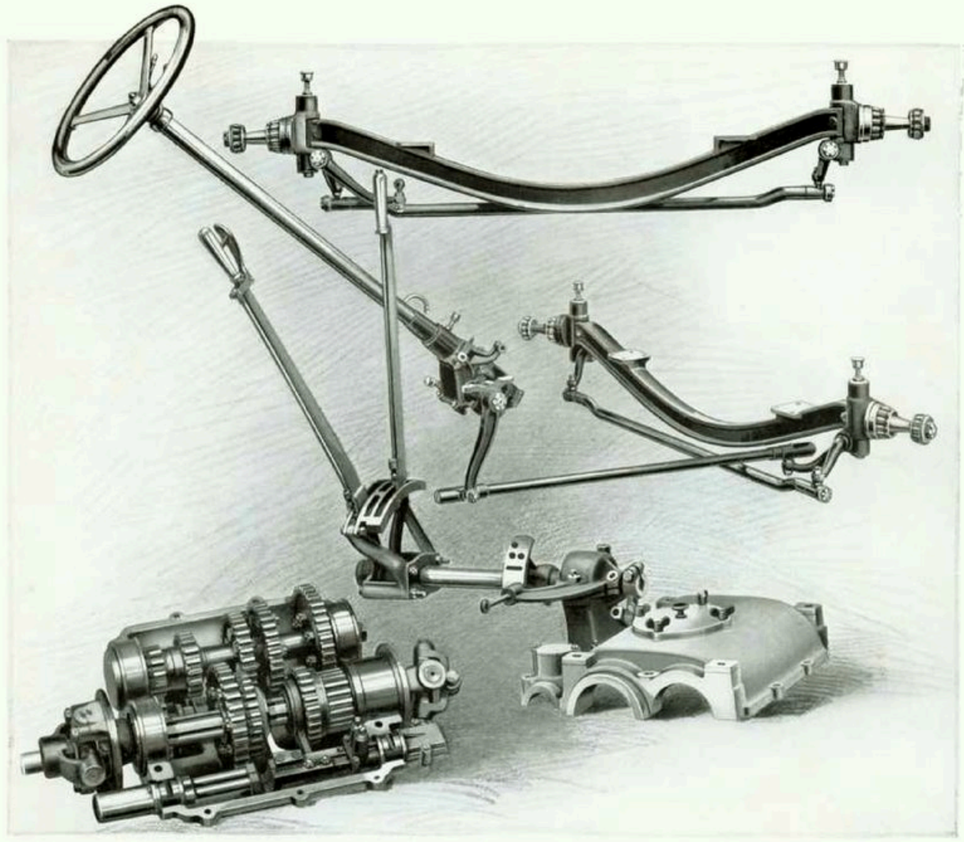
IGNITION Two systems are employed, both being entirely independent throughout. For regular service a Bosch high-tension magneto is employed. This is driven from a special shaft on the inlet side of the motor and constitutes a complete and self-contained ignition system in itself. Its only external parts are the spark plugs and the wiring. The plugs are located directly over the inlet valves while the ignition cables for both systems are carried in an insulating tube which minimizes the length of wiring exposed.

To render starting easier and for emergency purposes an equally complete battery system is provided. This consists of a six-volt, sixty-ampere-hour accumulator, a set of six non-vibrating coils synchronized by a master vibrator and an independent set of spark plugs located at the side of the inlet valves.

COOLING SYSTEM The cooling water is circulated by a centrifugal pump driven from an independent shaft on the exhaust side of the motor, and in addition to allowing ample jacket space at the hottest parts of the motor, the honeycomb radiator is designed to have a capacity in excess of the most severe requirements it will ever be called upon to meet. All connections are short and direct with easy bends, while the brass tubing is of large bore, so that in case of accidental derangement of the pump, the cooling water would be circulated on the thermo-syphon principle.

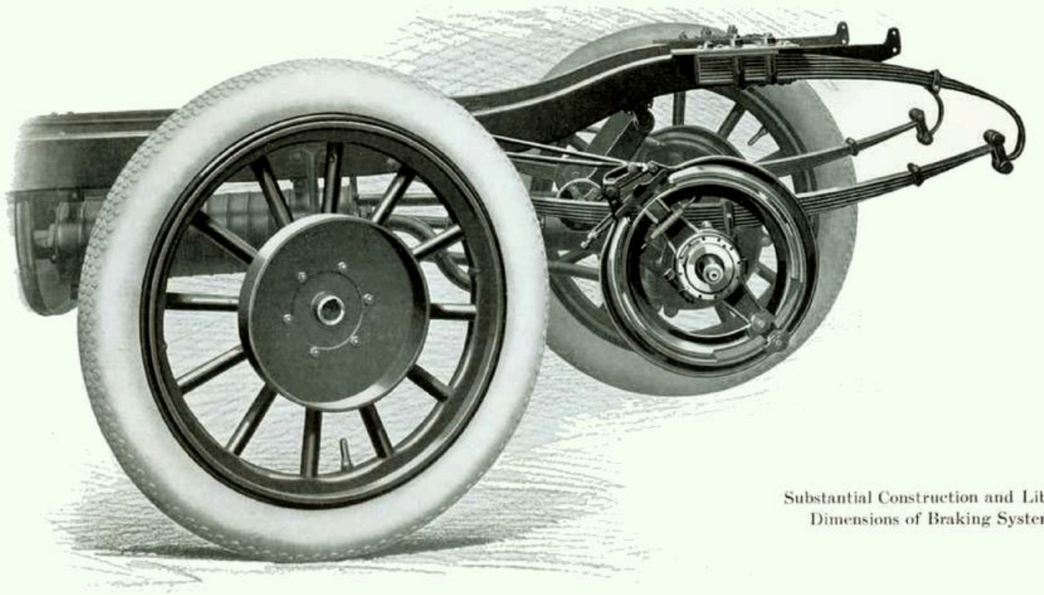
AIR PUMP A power-driven air pump forms part of the equipment of every Pierce-Arrow motor and is a valuable adjunct for inflating tires. As is the case with all other accessories, it is designed especially for the Pierce-Arrow motor and is made throughout in "The Factory Behind the Car". It is bolted to the frame forward and is driven by a pinion on the water pump shaft. This is easily slid into or out of engagement when the motor is stopped.

CLUTCH Due to its simplicity, light weight and reliability, a conical type of clutch was adopted for the design of the first multi-cylinder Pierce-Arrow chassis several years ago. Practice, as exemplified by the standards followed both here and abroad, has been responsible for the introduction of various types of clutches during that period and practically all of them have undergone more or less modification since their first appearance. But the experience gained in that time with a very large number of cars in daily service, has demonstrated that the simple

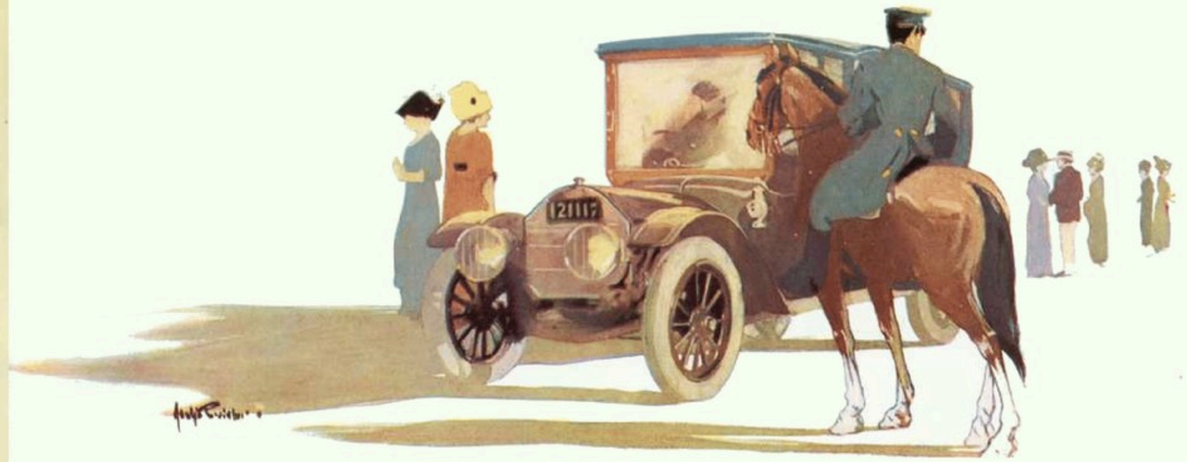


Details of Pierce-Arrow Gear-set and Operating Mechanism

Assembly of Pierce-Arrow Steering Gear and Front Axle



Substantial Construction and Liberal Dimensions of Braking System



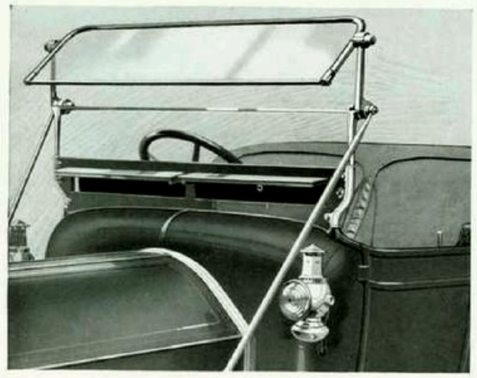
cone type has no superior. It consists of a light member of aluminum faced with a special lining directly engaging the turned inner face of the fly wheel. The angle of engagement is such as to provide ample friction without an unduly heavy spring pressure. A double universal joint and a special thrust ball-bearing are provided between the clutch and the gear-set — and a clutch brake is provided, greatly facilitating the quiet changing of gears.

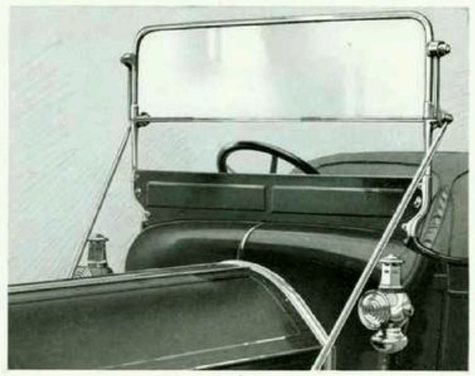
GEAR-SET This is of the sliding type, providing four forward speeds and reverse. The housing is an aluminum alloy casting divided horizontally. Both the shafts and pinions are of alloy steel and the former are mounted on Hess-Bright annular ball-bearings of sizes even larger than those specified by the makers for the service.

The shifting bars are equipped with spring-controlled detents which stop the sliding gears at the proper points for full engagement while the operating mechanism embodies a locking device which prevents shifting gears without disengaging the clutch.

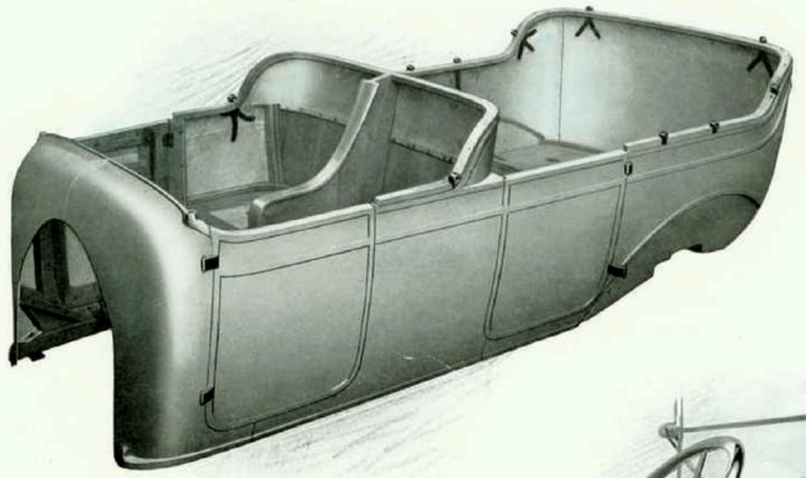
DRIVE The rear end of the main shaft of the gear-set is provided with a heavy universal joint attaching it to the propeller shaft, while the latter carries a combined universal and slip joint where it is connected to the bevel driving pinion. The torsion rod is a triangle of seamless steel tubing, having its apex carried in a spring-cushioned, hinged joint bolted to the after transverse member which supports the gear-set. At its base, the triangle is pivoted on a substantial bolt passing through the bevel gear housing.

The driving shafts of the live rear axle are of heat-treated chrome nickel steel and are fastened directly to the driving wheels. This material is also employed for the pinions of the bevel drive and the differential, both of which are mounted on large Hess-Bright annular ball-bearings. The inboard bearings of the driving wheels are also of this type while the outboard bearings are of the Timken roller type, due to their superior ability to withstand combined radial and thrust loads, two of these bearings being employed on each forward wheel.





Forward Compartment Ventilator in closed and open positions
(Patent applied for)



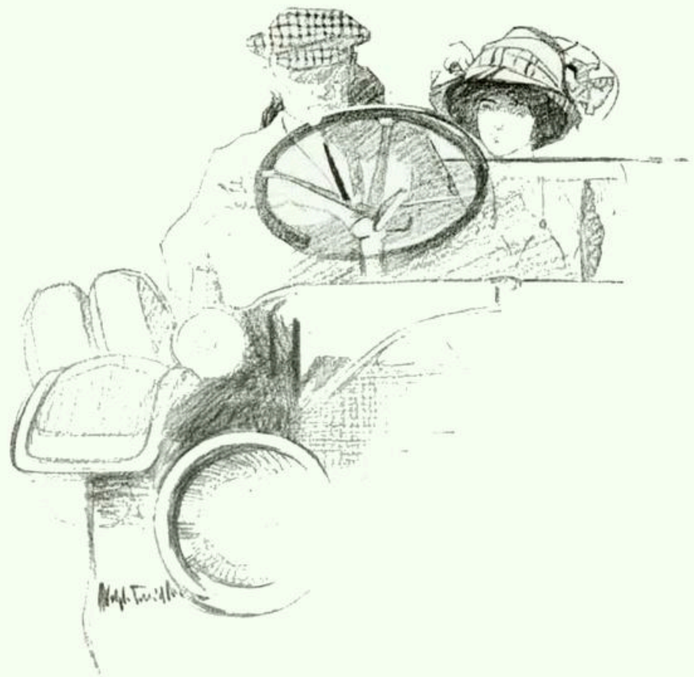
Aluminum Body in the Rough

Control Levers are inside with ample clearance

BRAKES In no other single essential of the entire chassis are Pierce-Arrow standards more strongly emphasized than in the braking equipment. Frequent occasions arise when the brakes are the most important part of the car, and the care given to their design and construction has been in proportion to this need. They are of ample dimensions to meet the most extreme requirements. Both the service and emergency brakes are applied to the driving wheels. They consist of heavy bands of special bronze, carried on a drop-forged steel hanger and designed to act upon steel drums. The pedal brake expands these bands, or shoes, against the inner face of the drums, while the emergency brake, operated by the side lever, causes a similar set of shoes to contract against the outer face of the drums. The pedal brake is interconnected with the clutch, automatically disengaging the latter before the brakes can act.

STEERING GEAR The steering spindle is a steel shaft, encased in a seamless steel, brass-plated tube. At its lower end, a multiple thread of extreme accuracy is turned on it. This thread engages a heavy, drop-forged steel block nut, threaded to correspond. Formed integrally with this nut are the arms of a trunnion, engaging hardened die blocks designed to slide in the jaws of a forked lever. Turning the steering spindle causes this nut to move up or down and this motion is multiplied and transmitted to the steering wheels through a series of levers. Spring-cushioned joints are employed to absorb road shocks and vibration and the most painstaking precautions are taken to guard against the accidental dislocation of these joints in service. The steering knuckles and spindles are one-piece drop-forgings of nickel steel of simple and substantial design. A ball thrust-bearing under the steering pillar permits of ready and accurate adjustment for wear.

SUSPENSION Flat semi-elliptic springs are employed in front, because no other type is so well adapted for that position. To provide the maximum comfort, long springs of the three-quarter elliptic type are employed at the rear. In connection with the Truffault-Hartford shock absorbers, which are a regular part of the equipment, this suspension provides the maximum comfort consistent with freedom from breakage.



REGULAR EQUIPMENT FOR PIERCE-ARROW 1912 CARS

REGULAR EQUIPMENT ON ALL MODELS WILL INCLUDE:

Two head gas lamps, with lighter operating from the seat, and Prest-O-Lite tank.
Two dash and one rear combination oil and electric lamps, the electric lamps lighted from the seat.
One rear number electric lamp.
Horn and full set of tools.
Pierce-Arrow Victoria Top (runabouts only).
Pierce-Arrow Cape Top (touring cars only).
Pierce-Arrow folding glass front, with rain vision.
Pierce-Arrow air power pump.
Gasoline tank gauge on dash.
Veeder odometer.
Four shock absorbers.
Extra tire carriers.
Trunk rack on all models.
Coat and blanket rails.
Folding foot rest on touring and enclosed cars.
Sprag. (Except 36 horse-power.)
Pierce gasoline primer for easy starting.
Yale locks, with universal key on hood, dash cabinets, tool compartments and oil and grease box.

The 48 and 66 horse-power touring car models have two extra seats in tonneau of folding type

SPECIFICATIONS IN BRIEF OF PIERCE-ARROW MOTOR CARS

ALL MODELS WILL HAVE:

No. of Cylinders	Six, cast in pairs.
Ignition	Two complete and separate systems: First, jump spark, 6 individual units, with one master vibrator; second, Bosch high-tension magneto.
Battery Equipment	One set storage.
Carburetter	Special automatic.
Control	Hand throttle and foot accelerator.
Oiling	Automatic to all crankshaft and pin bearings, cylinders and pistons.
Transmission	Selective, sliding gears, direct on high speed; side lever control, bevel gear drive.
Speeds	Four forward and reverse.
Bearings	Ball and roller bearings all over except motor.
Springs	Front, semi-elliptic; rear, three-quarter elliptic.
Regular Tires	Goodrich quick detachable. Goodrich-Bailey non-skid on rear.
Body Material	Cast aluminum.
Brakes	Equalized foot brakes on inside of drums on hubs; both rear wheels. Equalized hand brakes, on outside of drums on hubs, both rear wheels.

SPECIFICATIONS — Continued

	36 Horse-power	48 Horse-power	66 Horse-power
Cylinder Dimensions	4 x 5½ inches.	4½ x 5½ inches.	5 x 7 inches.
Rev. per Minute	300 to 1700	150 to 1600	120 to 1400
Gasoline Capacity	Runabout, about 20 gallons; 4-passenger touring, 18 gallons; other models, 22½ gallons.	Runabout, 21 gallons; 4 and 5-passenger touring, 20½ gallons; other models, 28 gallons.	Runabout, 21 gallons; 4 and 5-passenger touring, 20½ gallons; other models, 28 gallons.
Frame	Pressed cold rolled special carbon manganese steel, heat treated, channel section, drop frame, 4½ inches to 2⅜ inches deep.	Pressed chrome nickel steel, heat treated, channel section, drop frame, 4¾ inches to 2⅞ inches deep.	Pressed chrome nickel steel, heat treated, channel section, drop frame, 5 inches to 2⅞ inches deep.
Wheel Base	Runabout, 119 inches; other models, 127½ inches.	Runabout, 128 inches; other models, 134½ inches.	Runabout, 133½ inches; other models, 140 inches.
Wheel Tread	55 inches.	56 inches.	56 inches.
Wheels	Wood, artillery; 36 inches.	Wood, artillery; runabout, 36 inches all round; other models, 37 inches all round.	Wood, artillery; runabout, 37 inches all round; other models, 37 inches front, 38 inches rear.
Tire Dimensions	4½ inches all round.	Runabout, 4½ inches all round; other models, 5 inches all round.	Runabout, 5 inches all round; other models, 5 inches front, 5½ inches rear.

PRICES F. O. B. BUFFALO

COMPLETE WITH TOP AND GLASS FRONT

	36 Horse-power	48 Horse-power	66 Horse-power
Chassis in Lead	$3250	$4100	$5100
Runabout, seating two people, with folding rumble seat	4000	4850	5850
Four-passenger Touring	4000	4850	5850
Five-passenger Touring	4000	4850	5850
Seven-passenger Touring	4000	5000	6000

Brougham . . . 36 Horse-power, $4900 — †Suburban . . . 48 Horse-power, $6100 — †Suburban . . . 66 Horse-power, $7100
Landaulet . . . 36 Horse-power, 4900 — †Landau . . . 48 Horse-power, 6100 — †Landau . . . 66 Horse-power, 7100

†Five-passenger suburban or landau bodies (with two folding emergency seats) can be furnished with the 48 horse-power or 66 horse-power chassis for the same price as the seven-passenger.

TOP SPECIFICATIONS AND PRICES

*Cape top, lined with whip cord, with shifting rail, detachable side curtains and envelope for top when laid back; for 36 horse-power cars . . . $175
*Same for 48 and 66 horse-power cars 200
*Leather Victoria top, with shifting rail, detachable side curtains, or solid sides if ordered, and envelope for top when laid back $200
Semi-enclosed top, with sliding glass front and drop side curtains for all models 400
Same when ordered with car 150
*Divided folding glass front, all models 50

Seat covers, 2-passenger cars, $30; 3-passenger cars, $45; 4-passenger cars, $75; 5-passenger cars, $75; 7-passenger cars, $85

*Regular Equipment for 1912, when ordered with car.

Pierce-Arrow 40 Horse-power, Four-cylinder, Five-ton Motor Truck with Worm Gear Drive

STANDARD WARRANTY

ADOPTED MAY 4th, 1910

NATIONAL ASSOCIATION OF AUTOMOBILE MANUFACTURERS

(INCORPORATED)

We warrant the motor vehicles manufactured by us for ninety days after the date of shipment, this warranty being limited to the furnishing at our factory of such parts of the motor vehicle as shall, under normal use and service, appear to us to have been defective in material or workmanship.

This warranty is limited to the shipment to the purchaser, without charge, except for transportation, of the part or parts intended to replace the part or parts claimed to have been defective, and which, upon their return to us at our factory for inspection, we shall have determined were defective, and provided the transportation charges for the parts so returned have been prepaid.

We make no warranty whatever in respect of tires or rims.

The condition of this warranty is such that if the motor vehicle to which it applies is altered or repaired outside of our factory, our liability under this warranty shall cease.

The purchaser understands and agrees that no warranty of the motor vehicle is made, or authorized to be made, by the company, other than that hereinabove set forth.

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