



VAUXHALL

MOTOR CARRIAGES

The 23-60 h.p. & 30-98 h.p. models

	23-60	30-98
Description .	Page 4	Page 14
Specification .	Page 12	Page 16
Chassis Price } & Dimensions }	Page 17	Page 17
Complete car illustrations and prices in cover pocket "In the Vauxhall Works" Page 18		

VAUXHALL MOTORS LIMITED, LUTON, BEDFORDSHIRE

Telephone : Luton 466 (4 lines)

Codes : Motog & Bentley

Telegrams : Carvaux Luton

LONDON : 174-182 GREAT PORTLAND STREET, W.1

Telephone : Museum 8216 (3 lines)

Telegrams : Whirling Phone London

CANADA : 188 KING STREET W., TORONTO

Foreword

THE three models forming the Vauxhall Company's current manufacturing programme are the same (it being understood that detail improvements have been made) as those which have so decisively gained the approval of users of best-class cars during the past year.

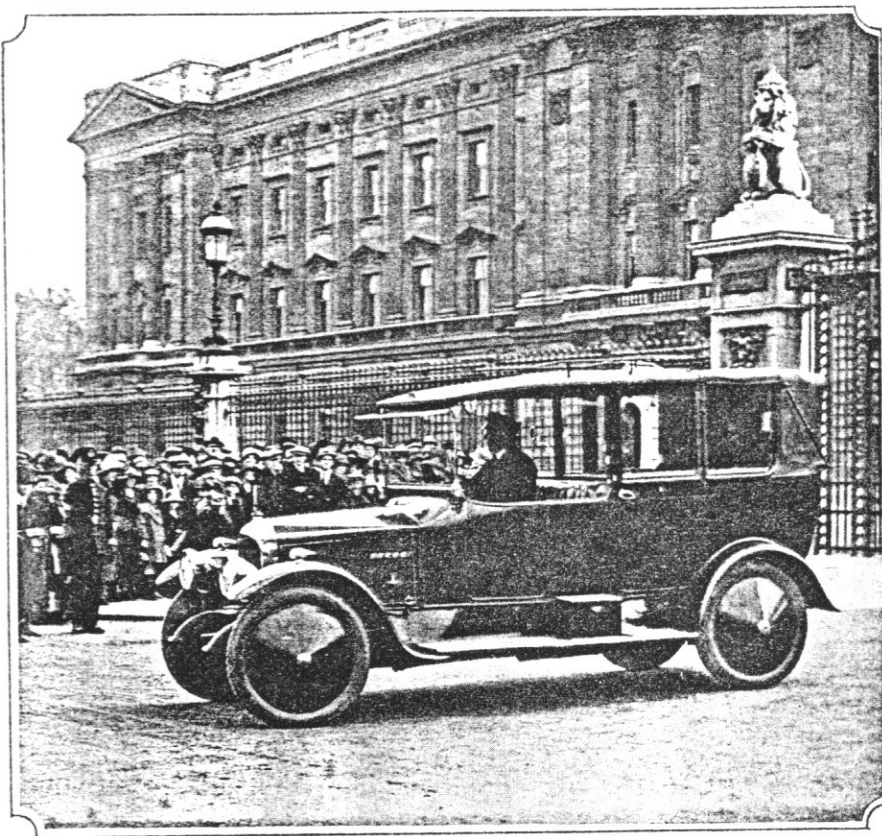
The 23-60 h.p. Vauxhall, with a performance that satisfies the most fastidious judge of motor-car merit; offers substantial economies in purchase price and upkeep cost; this, a year ago, may have been regarded as a claim yet to be made good; to-day hundreds of new owners can speak for its accuracy. The effect of the Lanchester harmonic balancer on refinement of running is now appreciated very widely.

The 30-98 h.p. Vauxhall holds its uncontested place as the most remarkable of sporting cars. It is the one car of standard construction which for ten years has been an 100 miles-an-hour car. The current pattern *laps Brooklands* at this speed.

The 14-40 h.p. Vauxhall (described in a separate catalogue) has still a stronger appeal than before as a genuinely high-grade car of unusual capabilities for its type, notable alike for refinement and economy.

The accumulated manufacturing experience of many years being a guarantee given to the buyer, it is of interest to point out that in 1924 the Vauxhall Company enters on the twenty-first year of its career. Very few firms have been uninterruptedly building standard pattern cars for so long a period.

BODY ILLUSTRATIONS.—Photogravure plates in the cover pocket illustrate the Vauxhall closed, convertible and open bodies. Description and price on the back of each plate.



THE PRIME MINISTER'S VAUXHALL CAR

THE 23-60 H.P. VAUXHALL

WITH OVERHEAD VALVES AND
LANCHESTER HARMONIC BALANCER

AMONG the three types of chassis manufactured by Vauxhall Motors Limited, the 23-60 h.p. O.D. type may be termed the weight-carrier, just as the 14-40 h.p. is of a lighter type, and the 30-98 h.p. of another distinct class—the extremely fast touring car.

The distinctive qualities of its engine render the 23-60 h.p. Vauxhall of the greatest interest to the big-car user: it possesses the three cardinal merits of exceptional power development, exceptional refinement of running and exceptional carburation efficiency.

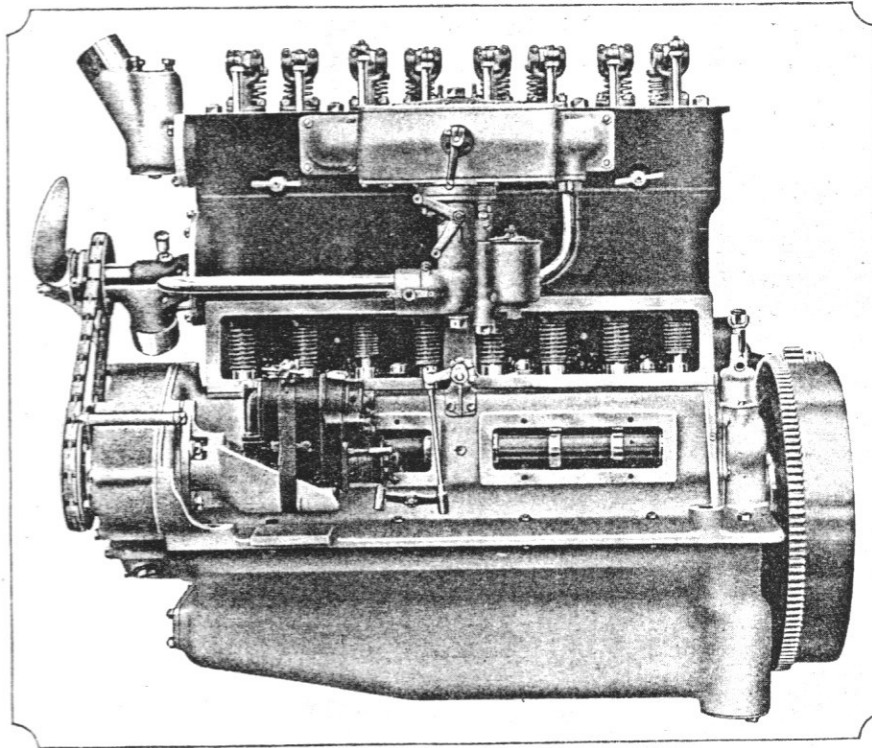
The engine dimensions are four cylinders of 95 mm. bore and 140 mm. stroke.

ENGINE POWER

The power obtained is shown in the sub-joined table.

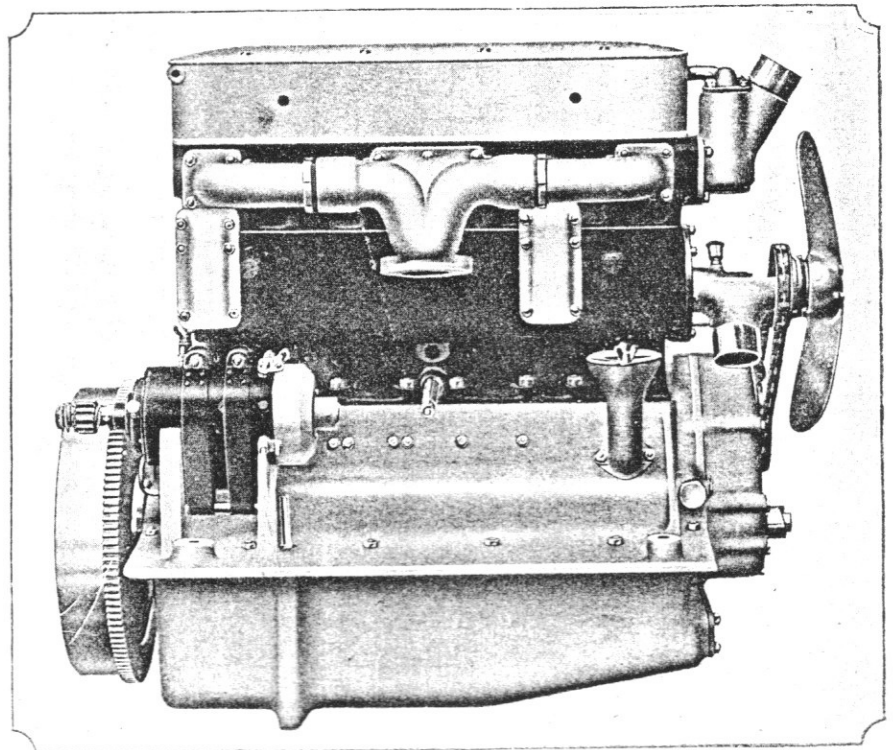
500 r.p.m.	1000 r.p.m.	1500 r.p.m.	2000 r.p.m.
14 h.p.	32 h.p.	47.5 h.p.	60 h.p.

A special object of the designer was to provide abundant power at low engine speeds, so that the car should have a quick get-away and very rapid acceleration, qualities which are highly valued by all drivers: the foregoing figures show how the 23-60 h.p. Vauxhall excels in this point.



23-60 H.P. ENGINE
NEAR SIDE VIEW

The capacious hot water jacket surrounding the induction pipe, the thermostat casing at the top left-hand of the cylinder head, and the magneto platform are noticeable features. The top cover and the inspection plates are removed.



23-60 H.P. ENGINE
OFFSIDE VIEW

The clean handsome appearance of the engine with the top cover in position is manifest in this view. The external water connections between the upper and lower cylinder castings and the two-bladed cast aluminium fan are clearly seen.



THE 23-60 H.P. VAUXHALL

One of the earliest of the new-type 23-60 h.p. Vauxhall cars, a standard fully-equipped touring car, when tested at Brooklands accelerated on top gear from 25 to 35 m.p.h. in 7 secs., from 30 to 40 m.p.h. in $7\frac{1}{2}$ secs., and from 35 to 45 m.p.h. in 8 secs.

The maximum power output, it may be remarked, is in excess of 60 h.p. The road speed maximum is approximately 65 m.p.h.

The overhead valves are operated by duralumin push rods which have cup-shaped ends of hardened steel.

Absolute quietness of the valve operating mechanism is obtained by scientific cam design. The whole valve gear is thoroughly lubricated by drip feed from a pipe carried in the aluminium top cover.

The cylinder head is detachable. The water connection between the lower casting and the head is through large external aluminium ports; hence the joint between the two castings is a simple compression joint.

VIBRATIONLESS ENGINE RUNNING

In an ordinary four-cylindere engine what are known as unbalanced secondary forces, giving rise to vibration, are unavoidable. On the other hand, there are many reasons which can be adduced in favour of the four-cylindere engine as compared with the 'six,' and hence investigators have long sought to discover how this vibration could be completely overcome.

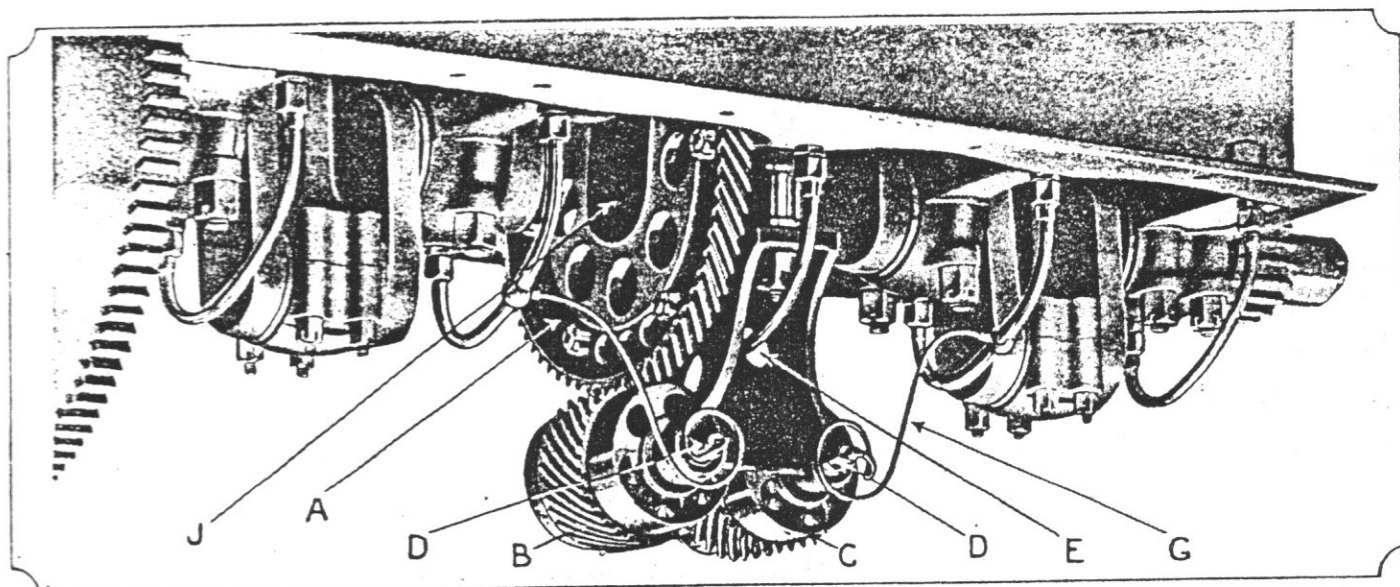
In the Lanchester harmonic balancer Dr. F. W. Lanchester, F.R.S., M.Inst.C.E., the eminent designer and consulting

engineer, solves this problem of the four-cylindere engine, retaining its inherent advantages of simplicity, lower cost, greater petrol economy, and smaller engine space, while placing it on a footing of equality with any six-cylindere engine for smoothness of running.

THE LANCHESTER HARMONIC BALANCER

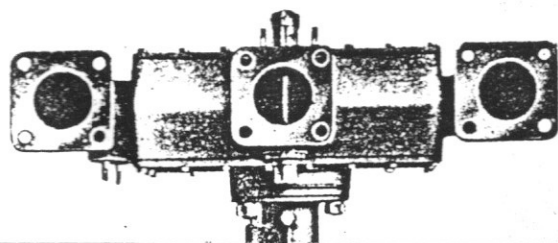
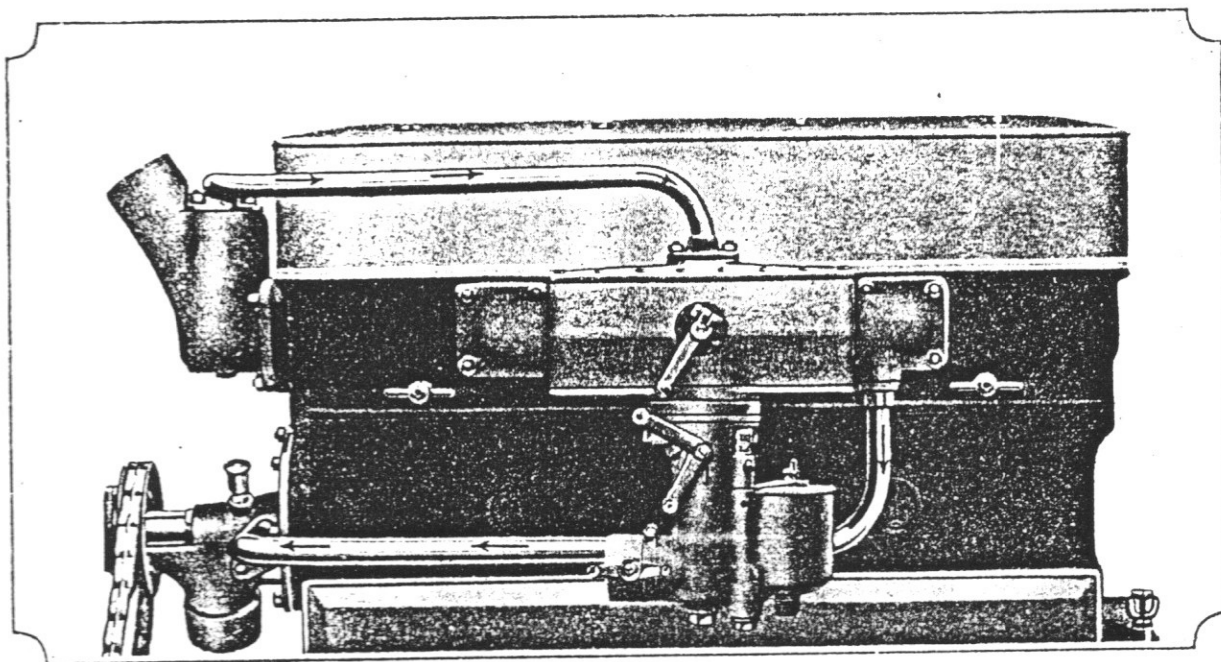
The 23-60 h.p. Vauxhall engine is the only engine fitted with the Lanchester harmonic balancer, and consequently the only perfectly balanced four-cylindere engine in the world. The device was tested in normal use for a very long period in Vauxhall cars, before it was adopted, and for more than a year it has been a permanent feature of the new chassis with perfectly satisfactory results. The following description, together with the illustration (p. 7), should enable its principle and action to be understood.

The Lanchester harmonic balancer is an auxiliary piece of mechanism of extremely simple character notwithstanding its ingenuity. It consists of a helical gear wheel A fixed to a web of the crankshaft J, engaging the drum B, which in turn engages the other drum C, each revolving on a spindle D. The drums are mounted on a bracket E, fixed to the crankcase, and are fed from the oil pressure system by means of pipes G, and surrounded by an oil trough. The drums are weighted in one half, the exact amount of the added metal being determined for each particular engine by a chart, after ascertaining the aggregate weight of its pistons, rings, gudgeon pins and connecting rod small ends.

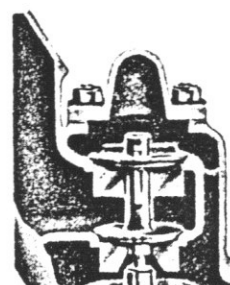


LANCHESTER HARMONIC BALANCER

This photograph shows the balancer in position in the engine, the helical gear wheel being fixed to a web of the crankshaft, and the weighted drums being mounted on a bracket fixed to the crankcase. By this ingenious device, the invention of Dr. F. W. Lanchester, F.R.S., M.Inst.C.E., the engine is exactly balanced.



Above : The arrows show the passage of the water from the thermostat through the induction jacket and thence to the pump. Left : The induction jacket is shown detached from the engine and reversed, so that the valve controlling the hot spot may be seen. Right : The thermostat, consisting of a one-piece all-metal bellows and a





THE 23-60 H.P. VAUXHALL

The secondary forces occur with twice the frequency of the primary forces; hence the weighted drums are caused to revolve at twice the crankshaft speed, so that the force which they set up shall be opposed exactly to the secondary forces, and thereby balance or cancel them.

Contrary to what might be expected, no power is absorbed by the rotating gears; they suffer no appreciable wear, and no noise whatever is heard from them. Indeed, it is impossible to tell that the engine is fitted with the balancer except by the entire absence of vibration.

The effect of this remarkable device is to cause the engine to run with absolute smoothness, eliminating all engine vibration and the body-drumming arising from it.

FEATURES OF THE CARBURATION SYSTEM

A system that enables the engine in the shortest time after starting-up to work at the most efficient temperature, either in cold or hot weather, is provided in the 23-60 h.p. Vauxhall. The saving of petrol which otherwise would be used up in getting the engine warm, or wasted through wrong temperature conditions during the period of use, and the other advantages gained by temperature regulation, are important considerations in reckoning running expenses. It may be pointed out here that the 23-60 h.p. Vauxhall can be depended on to show a consumption of 20 m.p.g., if not more, for average work.

This peculiar efficiency of the 23-60 h.p. Vauxhall in carburation and temperature regulation is secured by a 'hot spot' in

the induction pipe (which, moreover, is thoroughly hot-water jacketed), thermostatic control of the water circulation, and the ample reservoir of water contained in the large radiator.

INSTANT VAPORISATION

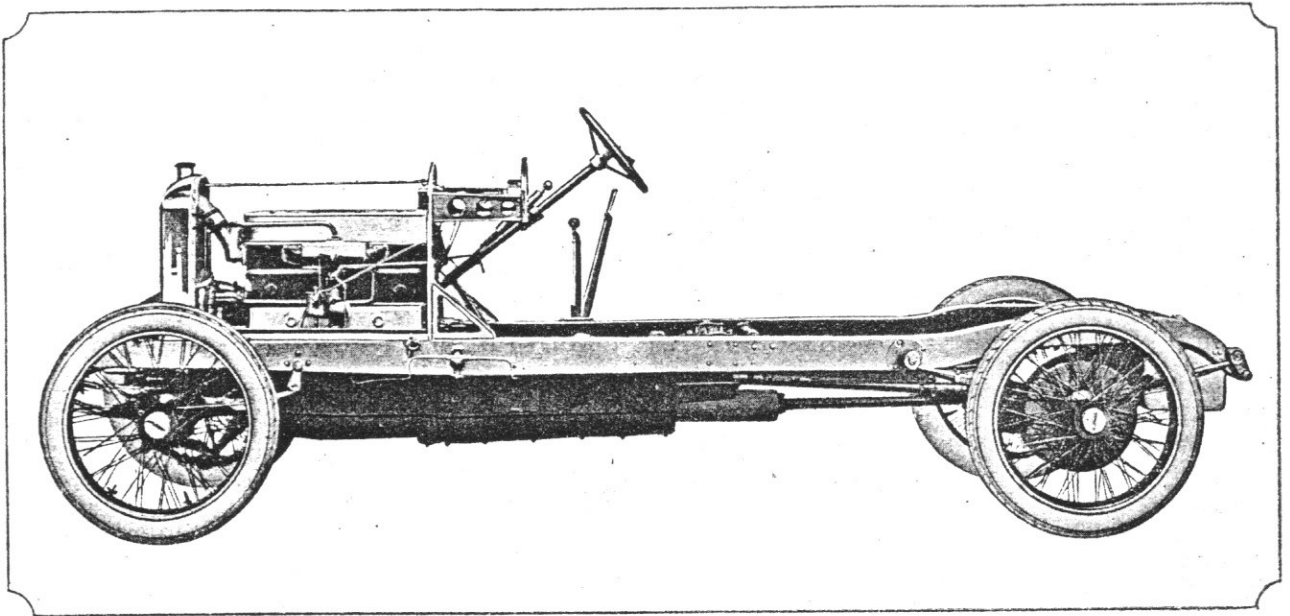
The hot spot (in conjunction with the cutting-off of the radiator by the thermostat) enables the car to be driven in the coldest weather immediately the engine is started. It is made by leading exhaust gases directly to that point on which the petrol vapour strikes as it issues into the induction pipe. At the same time the water is prevented by the thermostat from flowing into the radiator, and the warm water thus by-passed is conducted by an external pipe to the induction jacket, passing through it and thence to the pump.

In hot weather this aid to instant vaporisation will not be required; accordingly provision is made for shutting off the exhaust gases by a very simple adjustment, calling merely for the slackening of a nut, the closing of a valve, and the re-tightening of the nut.

It may be pointed out that the Vauxhall hot spot device differs from and functions more completely than the ordinary crude hot zone: there are specially designed exhaust passages, which set up in the gas an oscillatory surging, thereby ensuring the most effective conditions of thermal reaction.

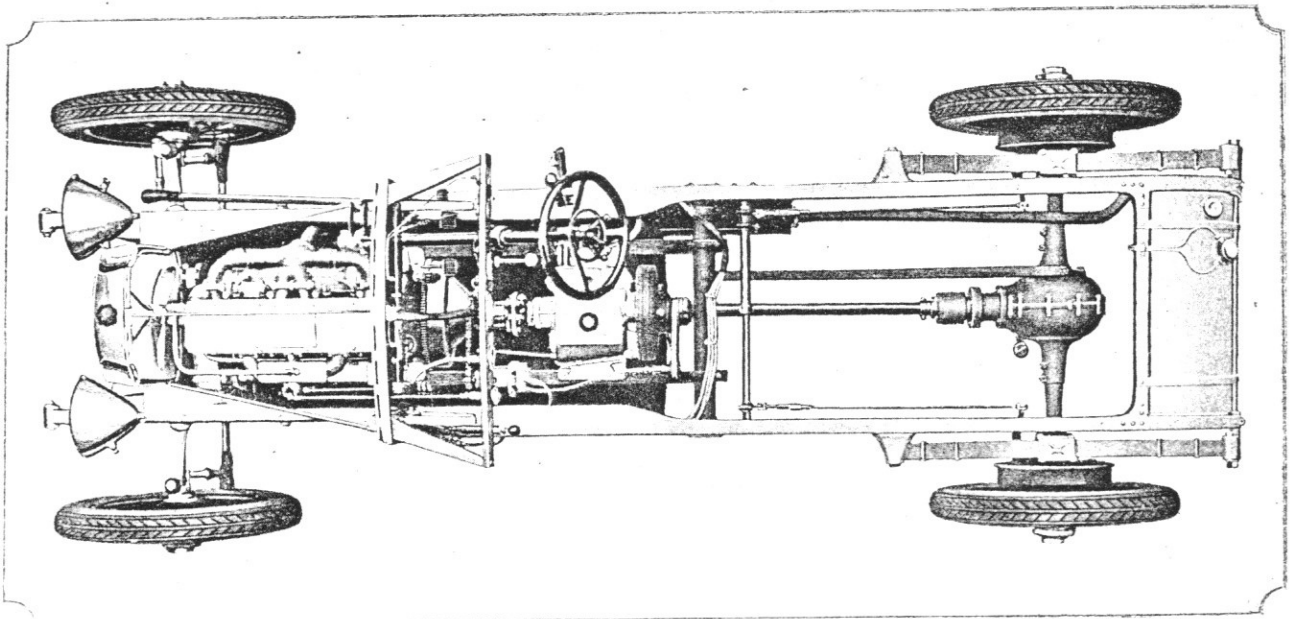
TEMPERATURE REGULATOR

The thermostat, fitted in the pipe connecting the cylinder head with the radiator, depends on the action of a volatile gas



ELEVATION AND PLAN VIEWS OF THE 23-60 H.P. CHASSIS

General robustness of construction and simplicity of design characterise the Vauxhall chassis. The annoyance caused by the rattling which in many cars develops in various parts after about twelve months of service is avoided by the careful steps taken to prevent this in the Vauxhall design, as will be seen on critical examination of the spring leaves and shackles, universal joints, front axle pivots and steering connections. The fullest consideration has been given to minimise the trouble of oiling and adjustment.





THE 23-60 H.P. VAUXHALL

within elastic metal bellows.

By contraction or expansion it governs a valve, which thus controls the passage of the water from the jackets to the radiator. As this valve is shut when the engine is cold, the radiator is cut off, and the water round the cylinders more quickly becomes warm after starting-up. Immediately it rises to a pre-determined temperature, the thermostat opens the valve and allows just the correct quantity of water to pass through the radiator. In this way (the water supply being, as pointed out below, sufficient for any climate) the most efficient running temperature is maintained constantly, the valve being open or shut according to the heat of the water in the jackets.

COOLING EFFICIENCY

Advantage has been taken of the action of the thermostat to keep the radiator of the same capacity as it was in the side valve engine, although the overhead valve engine gives off 40% less heat to the cooling water. A very liberal margin of safety is thus allowed against over-heating, even under the severest conditions found abroad.

In all parts of the world where a high-powered car can be used, the 23-60 h.p. Vauxhall will run with equal satisfactoriness whether there is extreme heat or extreme cold to be contended with: the radiator capacity is ample, and the thermostat control prevents both over-cooling and over-heating.

It may be not unwarrantably claimed that those features of the engine which have been described in the foregoing pages stamp it as a design carefully considered

to ensure the big-car user certain definite advantages: very large power in relation to size, higher running economy, and increased refinement without greater cost.

CONSTRUCTIONAL DETAILS

In the specification (p. 12) a concise description is given of the entire chassis. To gain an idea of the accessible positions given to essential parts where attention is required, such as the carburettor, magneto, oil filler, footbrake adjusting nut and so on, a glance at the illustrations will be sufficient. (An instruction book containing full directions, and specially illustrated, is issued with each chassis).

Throughout the chassis, indeed, the most careful study is made to render oiling and adjustment as little irksome as can be. As examples of simple though ingenious devices that save much trouble, the adjustment of the magneto chain and the fan belt may be instanced.

ADJUSTMENT MADE EASY

The ball races of the magneto shaft are mounted eccentrically, the magneto platform being a part of the rearmost eccentric. The two eccentrics are connected by a bar. To adjust the chain it is only necessary to slacken the locking nuts and move the bar, when the chain pinion together with its bearings and the magneto itself can be moved as a whole, the magneto remaining upright since its platform is solid with the eccentric.

The adjustment of the fan belt is effected by screwing-in the flange of the pulley immediately behind the fan, which by enlarging the diameter of the pulley tightens the belt.

THE 23-60 H.P. VAUXHALL

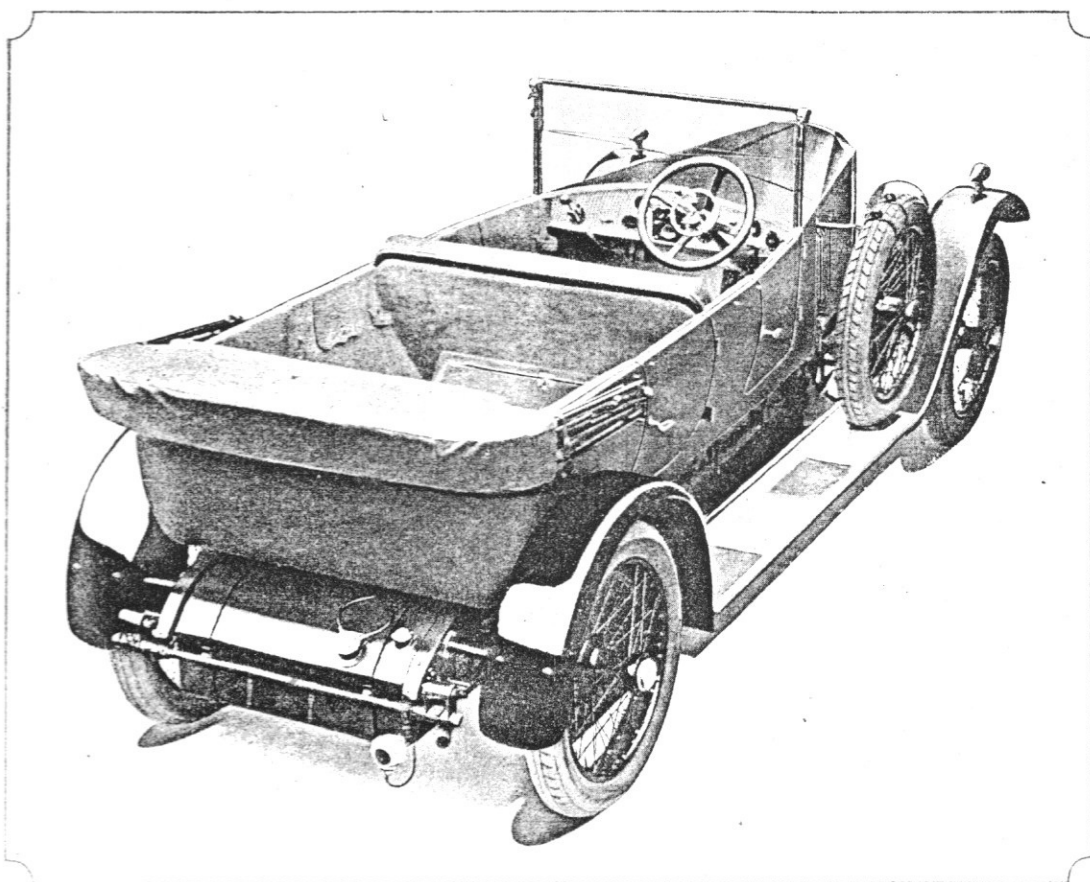
Solidity of construction, which is the basis of luxurious riding comfort as well as durability, is an essential feature of the 23-60 h.p. Vauxhall chassis. In spite of this the car, with abundant power at command, has a high degree of flexibility and an excellent top-gear performance.

The Vauxhall has long been accorded a place among best-class cars, that is to say, those few makes which, though differing in design, have alike acquired a reputation for positive excellence judged by the highest standards.

The 23-60 h.p. Vauxhall is not merely

the finest four-cylindere car produced in any country: it ranks as one of the great cars of the world on the sheer quality of its performance, ignoring schools of design.

Since in every practicable aspect of road use it is comparable with much more expensive cars, it stands out as virtually a new development in big-car construction, offering the user of such cars a chassis that is ideal for luxurious motoring, with the advantages of moderate initial cost, a small annual tax, and remarkably low running expense, having regard to its performance and body accommodation.



THE KINGTON

A rear view of the "finest-looking car on the road" giving some idea of the interior style and finish.

23-60 H.P. VAUXHALL—SPECIFICATION

ENGINE

Four cylinders, 95 mm. bore by 140 mm. stroke, R.A.C. rating, 22.4 h.p. developing more than 60 h.p. on the bench. Overhead valves operated by push rods. Lanchester harmonic balancer, securing positive smoothness of running. Cylinder capacity 4 litres. Firing order 1-2-4-3. Crankshaft has five bearings of following dimensions: front and rear 2 inches diameter by 3 inches; second, third and fourth, 2 inches diameter by 2½ inches. Pins, 2 inches diameter by 2½ inches.

IGNITION

High tension magneto, variable spark.

CARBURETTOR

Zenith, with air strangler for easy starting from cold. An extra air inlet worked by a lever fitted above the steering wheel allows the strength of the mixture to be varied at the will of the driver, who can thus make his choice between maximum power and maximum economy.

LUBRICATION

The forced lubrication is on the Vauxhall pump system, and requires no attention whatever.

COOLING

The Vauxhall fan and pump combination (successfully employed since 1912) in conjunction with temperature control by thermostat. Two-bladed cast aluminium fan. Improved type of pump with gland designed to prevent annoying water leaks. Improved locking device on the fan belt pulley. The same belt drives the pump and the fan; adjustment of the belt is very rarely necessary but can easily be made (see page 10). Capacity of cooling system, 6 gallons. Honeycomb radiator.

FRONT AXLE

The front axle has inclined steering pivots, which are completely encased and lubricated with oil. The steering connections are so disposed that no shocks are transmitted through the steering wheel.

STEERING

Worm and wheel type. The Vauxhall steering gear is noted for being exceed-

ingly light in operation and for its automatic stability. Steering wheel 17 inches diameter.

CLUTCH

Vauxhall multi-disc with dry plates running in graphite. The power is taken up with perfect smoothness. The Vauxhall clutch is particularly light in operation. Fabric joint between clutch and gearbox.

GEARBOX

Four speeds and reverse. The top speed is direct.

FOOT BRAKE

The foot brake is placed at the rear of the gearbox, and is easily adjustable. Asbestos fabric-lined.

BACK AXLE

The back axle is of orthodox design, with straight tooth differential gear and spiral bevels. The road wheels are carried on sleeves, so that the axle is of the full floating type.

HAND BRAKE

On rear hubs; 16 inches diameter. Internal (expanding), asbestos fabric-lined.

SPRINGING

The springs are semi-elliptic, made of silico-manganese steel. Front 36 inches by 2 inches; back 48 inches by 2½ inches.

PETROL SUPPLY

Vacuum feed from tank at rear. Tank holds 12 gallons.

WHEELS

Detachable wire, 880 mm. by 120 mm.

FINISH

Nickel.

EQUIPMENT

Complete Vauxhall cars supplied by the Company have a standard equipment of electrical starting and lighting (6 lamps), aluminium instrument board fitted with speedometer, clock, lamp, switchboard, dimmer switch for headlights, and gauges, five detachable wire wheels and five Dunlop cord tyres, bulb horn and electric horn, petrol lever indicator in tank, and full tool kit. When a

chassis only is delivered, the equipment included in the chassis price is as above stated.

VARIATIONS OF STEERING RAKE AND SPRINGS

The O.D. type chassis is built for three types of body:

- (1) Open body with torpedo steering rake and open car type springs. *Order—Chassis O.D. open.*
- (2) Closed body to be driven by chauffeur, with upright steering, and closed car type springs. *Order—Chassis O.D. chauffeur closed.*
- (3) Closed body to be driven by owner, with torpedo steering rake, and closed car type springs. *Order—Chassis O.D. owner closed.*

The following particulars of standard open body dimensions will be found useful:—

Width of front door opening	19 ins.
Width of rear door opening	20 ins.
Leg room, front seats to pedals	23 ins.
Leg room, rear seats to foot-boards	25 ins.

23-60 h.p. (Export Type) Chassis

The 23-60 h.p. Vauxhall chassis possesses the great structural strength and general reliability which are necessary for constant use on bad roads, and travelling long distances in countries where assistance is seldom within easy reach.

All chassis for Overseas use have the lower gearing (see page 17).

COOLING

The adequacy of the Vauxhall cooling system is pointed out on page 10.

ACCESSIBILITY

All parts requiring attention are easily got at and are so designed that they give the least possible trouble.

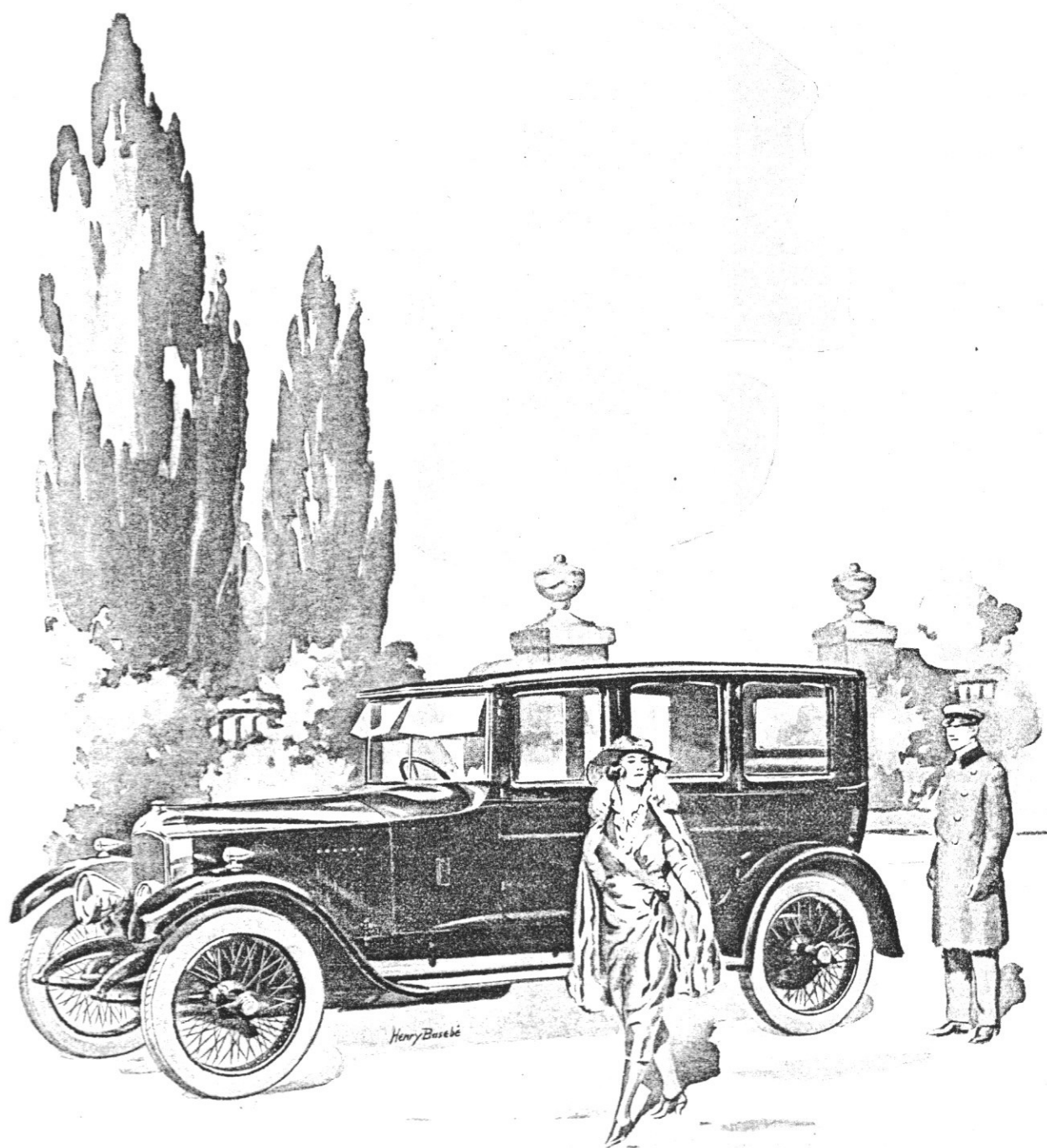
CLEARANCE

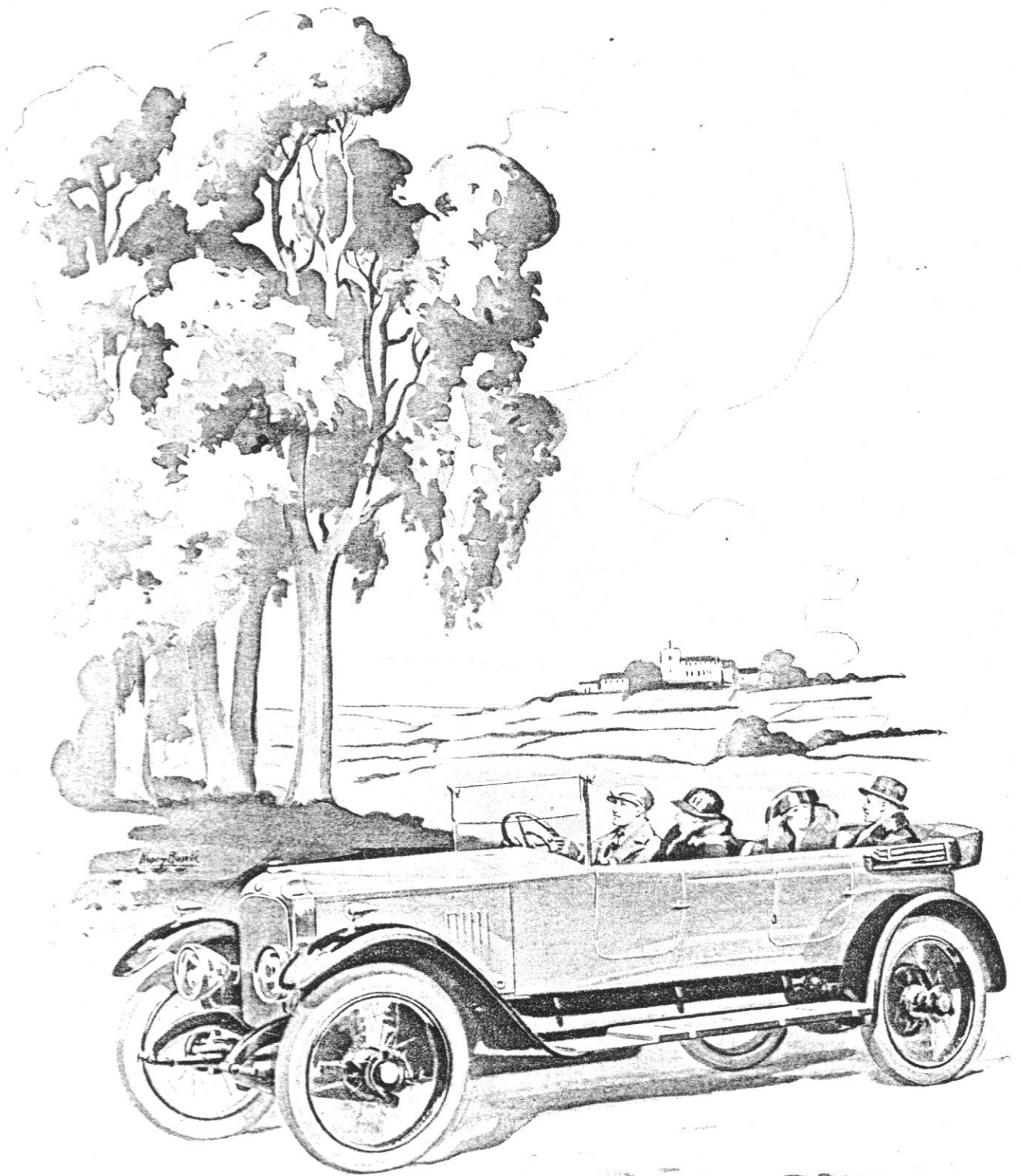
About 9 inches under the rear axle. It may be mentioned that Vauxhall cars with this clearance have accomplished many difficult journeys over rough ground, e.g.:

Melbourne—Adelaide (580 miles); Melbourne—Sydney (575 miles); Brisbane—Sydney (817 miles); the cross-desert route from Baghdad to Damascus.

 **FOUR-WHEEL BRAKES.** *Front-wheel brakes are fitted if desired, at an extra charge*

GUARANTEED FOR ONE YEAR FOR HOME OR OVERSEAS USE





THE 30-98 H.P. VAUXHALL

(O.E. TYPE)

FAST TOURING CAR

THE 30-98 h.p. Vauxhall was brought out ten years ago. Even then it was guaranteed to attain a speed of 100 m.p.h., a guarantee believed to be unprecedented for a standardised chassis. Appreciation of the fact that so long ago the 30-98 h.p. Vauxhall was a car of this exceptional speed gives a clue to its capabilities to-day, when its power development has reached a point beyond anything attained before. The current pattern engine is of four cylinders, 98 mm. bore by 140 mm. stroke, with overhead valves, the cylinder capacity being 4.25 litres. It develops 112 h.p., as compared with 90 h.p. developed at 3,000 r.p.m. by the engine immediately prior to it, the same carburettor being used in both. The peak of the power curve, instead of falling at 3,000 r.p.m., does not begin to drop until the revolutions exceed 3,600 per minute.

As a consequence of an advance in the design of the cam profile, and of the adoption of overhead valves, smaller valves can be used, and they operate with precision at this great speed without undue spring pressure.

Overheating is avoided by the care which has been taken to have the exhaust valve seats and stems, and also the sparking plugs, entirely surrounded by the cooling water. Expensive special plugs are therefore not needed; an ordinary cheap porcelain plug stands up to the work indefinitely. One object in reducing the stroke of the new engine (the stroke was formerly 150 mm.) was to lessen inertia and centrifugal loadings on the bearings, and further re-

ductions in these loadings have been made by fitting duralumin connecting rods. These rods have moreover a valuable heat-dissipating property; heat generated in the big end of the bearing is so rapidly conducted away that it has been found impossible under the severest tests to melt out the big-end bearings in 30-98 engines fitted with these rods.

The pistons are of die-cast aluminium, a notable triumph of the die-maker's art. They are so designed that the heat of the explosion is transmitted from the piston head by two paths; one leads down the skirt of the piston at the top, and the other leads down the cylindrical support carrying the gudgeon pin to the base of the skirt, where the piston is in contact with the coolest part of the cylinder wall. This special type of piston is able to work with a minimum clearance, and to deal with the vast amount of heat generated in an engine of this size when running at revolutions in the neighbourhood of 4,000. The new valveless rocking plunger pump supplies oil under pressure to every plain bearing in the engine. The over-head rockers are lubricated by the same pump, the supply of oil being controlled by a reducing valve in the rocker cover.

Great attention has been paid to the questions of oil and fuel economy. A petrol consumption of 25 m.p.g. can be obtained at a speed of 30 m.p.h.

The front-wheel brakes are of Vauxhall design, having been evolved from extensive tests made of various systems. The pedal brake operates four shoes in the front-wheel drums and also two shoes in a drum

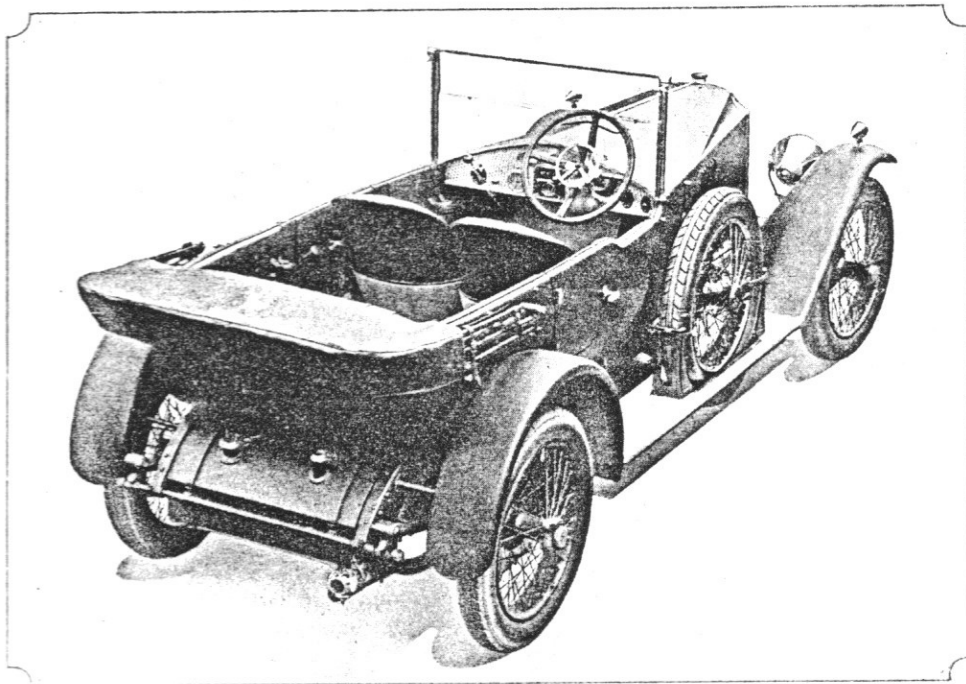
THE 30-98 H.P. VAUXHALL

behind the gear-box. It is provided with a compensating mechanism. The combined action of the two brakes is exceedingly smooth and powerful. An important feature of the Vauxhall design is facility of adjustment, combined with perfect balancing mechanism between the two front drums. The brake-shoe wear can be adjusted externally by means of a finger nut, for each wheel separately, without in any way modifying pedal clearance or affecting any linkage in the control.

In its road performance the 30-98 h.p. Vauxhall displays a satisfying smoothness of running not only at high but also at low speeds, its enormous power being joined with the tractability that is expected in a normal high-grade touring car. It is in short a very fast but a comfortable touring car, safe and easy to drive, in that it holds the road extremely well, is provided with

braking power corresponding to its phenomenal acceleration and speed, and has the light yet firm Vauxhall steering. Its hill-climbing capabilities may be judged from the many successes of standard pattern 30-98 h.p. Vauxhall cars at the principal hill-climbing contests year after year.

Any purchaser of a 30-98 h.p. Vauxhall-Velox car can feel assured that its maximum speed as a touring car (with the full equipment of mudguards, windscreen, hood, lamps, etc., and carrying four persons) will be not less than 80-85 m.p.h. on the track. In a recent trial at Brooklands on behalf of a prospective purchaser, who wished to have proof before taking delivery that his car would do 100 m.p.h. with a racing body, this speed was easily reached. In fact, 105 m.p.h. down the railway straight, in the teeth of a strong wind, was recorded.



THE VELOX

The familiar rear view of "the car that sets the pace."

SOME '30-98' SUCCESSES IN 1923

This list does not include the many successes gained by the T.T. Vauxhall racer. It deals only with distinctions won by standard-pattern '30-98' cars.

Melbourne-Sydney Record (Jan., 1923)
565 miles in 14 hours 43 minutes.

Inter-Varsity Hill-Climb
Class 8, First.

Essex Motor Club's Hill-Climb
Class 48, First. Class 49, First.

Brooklands Easter Monday Meeting
Two Seconds, One Third.

Auckland Motor Club (New Zealand)
Sprint Race, First.
50 miles race, First, winning New Zealand Cup.

Herts County A.C. Hill-Climb
Two Firsts on time, One First and One Second on formula. Fastest time, winning Challenge Cup.

Middlesex County A.C. Hill-Climb
First on time, Second on formula.
Kensington Cup for fastest time of the day.

Yorkshire A.C. Speed Trials
Two Firsts, Three Seconds, One Third.

Porthcawl Speed Trials
Class O, First.

Lancashire A.C. Reliability Run
Class over 1,800 c.c. Petrol consumption test, First.

Royal A.C. of Australia
Speed test, First and Second.

Brooklands A.R.C. (August)
Two Firsts, One Second.

Hampshire A.C. Hill-Climb
First and Second on formula.

Royal A.C. of Australia Hill-Climb
(Kurrajong Reliability Contest.)
Fastest time of the day.

Royal Netherlands A.C.
(Bussum and Scheveningen Meetings)
Two Firsts.

Shelsley Walsh Hill-Climb
Class 6, Second. Closed Class, Third on formula.

Scottish Western Motor Club's Speed Trial
Three Firsts.

North Eastern Centre A.A. Hill-Climb
First.

SPECIFICATION

ENGINE Four cylinders, 98 mm. bore by 140 mm. stroke, developing on the bench 112 b.h.p. Overhead valves. R.A.C. rating, 23.8 h.p. Cylinder capacity 4.25 litres.

IGNITION High tension magneto, variable spark.

CARBURETTOR Zenith aero type 48 R.A.

LUBRICATION Vauxhall pump system.

COOLING Vauxhall fan and pump combination. Temperature control by thermostat. Honeycomb radiator.

CLUTCH Vauxhall multi-disc.

GEARBOX Four speeds and reverse. Direct on top.

BACK AXLE Semi floating type. Spiral bevel drive and bevel differential,

BRAKES Four-wheel brakes. Foot-brake operates four shoes in the front wheel drums and two shoes in drum behind gear box. Hand-brake on rear axle hubs.

SUSPENSION Semi-elliptic springs, with shock absorbers throughout.

WHEELS Detachable wire, 820 mm. by 120 mm. Dunlop cord tyres.

PETROL SUPPLY Vacuum feed from tank at rear. Tank holds 12 gallons. Petrol level indicator.

BODY A specially light body—the Vauxhall-Velox—is built by the Company. See remarks below on weight.

FINISH Nickel.

WEIGHT The weight of the 30-98 h.p. chassis with VM. equipment and tanks full, is 23 cwt. The complete Vauxhall-Velox four-seater car weighs 28 cwt. Customers intending to have a body built by their own coach-builder are notified that the maximum body weight for this chassis is 6 cwt.

GUARANTEED FOR ONE YEAR FOR HOME OR OVERSEAS USE

DIMENSIONS, GEARINGS AND PRICES

(For variations of 23-60 h.p. O.D. type steering rake and springs—see p. 12)

							O. D. type				O. E. type			
Horse-power							23-60				30-98			
R.A.C. rating							22.4				23.8			
No. of cylinders							4				4			
Bore and stroke							95 mm. x 140 mm. 3 $\frac{3}{4}$ ins. x 5 $\frac{1}{2}$ in.				98 mm. x 140 mm. 3 $\frac{7}{8}$ in. x 5 $\frac{1}{2}$ ins.			
Valves							Overhead				Overhead			
Transmission							Four speeds, live axle				Four speeds, live axle			
Gearing for Open Cars		Gear ratio on direct drive					† 3.6 : 1				3.33 : 1			
		† 23-60 h.p. For open cars for Home use.					1st	2nd	3rd	4th	1st	2nd	3rd	4th
		Speeds (in miles per hour) at 1000 r.p.m. ...					7.5	12	19	28.5	8	12.5	18.7	29
Gearing for closed and Overseas Cars		Gear ratio on direct drive					† 4.12 : 1				No alternative gearing			
		† 23-60 h.p. For closed cars and all overseas cars.					1st	2nd	3rd	4th				
		Speeds at 1000 r.p.m.					6.6	10.5	16.5	24				
Wheelbase							10 ft. 10 ins.				9 ft. 10 ins.			
Distance from dash to centre of back wheel							7 ft. 9 $\frac{1}{4}$ ins.				6 ft. 6 $\frac{1}{2}$ ins.			
Length from dash (body space)							8 ft. 8 ins.				7 ft. 3 $\frac{1}{2}$ ins.			
Length over all							14 ft. 6 ins.				13 ft. 7 ins.			
Length of car over all (hood down)							15 ft.				14 ft. 1 in.			
Track							4 ft. 8 in.				4 ft. 6 ins.			
Width of frame							35 ins.				34 ins.			
Width over all							5 ft. 8 in.				5 ft. 6 ins.			
Size of standard tyres							880 x 120 †				820 x 120			
Weight of chassis							27 cwts. §				23 cwts. §			
Price of chassis							With full equipment £695 * Delivery at works				With full equipment £1020 Delivery at works			
Tax							£23				£24			

* With four-wheel brakes, £55 extra.

† Larger wheels and tyres (895 × 135) are recommended for closed cars, in order to secure greater comfort and tyre economy. The extra charge when these wheels are fitted is £12 : 5 : 0 on the basis of present price lists.

§ Including starting and lighting installation with lamps, instrument board with fittings, spare wheel and tyre, horns, tool kit, and water in radiator.
SECOND SPARE WHEEL.—A second spare wheel can be fitted (at an extra charge), but ample previous notice is necessary, so that the mounting can be provided.

The 14-40 h.p Vauxhall (4 cylinders, 75 mm. × 130 mm.) is dealt with in a separate catalogue.

IN THE VAUXHALL WORKS

POINTS OF INTEREST IN THE CONSTRUCTION OF A HIGH-GRADE CAR

IN the Vauxhall works the ideal aimed at is to make every possible economy that machinery offers, so long as the high standard of quality and finish set by the Company's policy does not suffer. It follows from this that the methods employed do not profess to be always the most rapid, nor the least costly in human effort. A more rapid or less expensive method cannot be entertained if its result would be to lower the traditional Vauxhall standard.

In particular, freedom is preserved for giving early effect to advances in design, which are always put into the car with the least delay, thus keeping it abreast with the progress of automobile engineering, to the advantage of the user.

A high-grade chassis is considered as an individual piece of work, on which the maximum skilled attention must be bestowed. Its construction is far from being merely a matter of machining operations. Before the road-testing stage is reached many aids to perfection are called into service: a combination of machining, inspecting and assembling, rather than any of these processes singly. In such a works as the Vauxhall Company's, the visitor is always impressed by the thought and care given to perfecting the product.

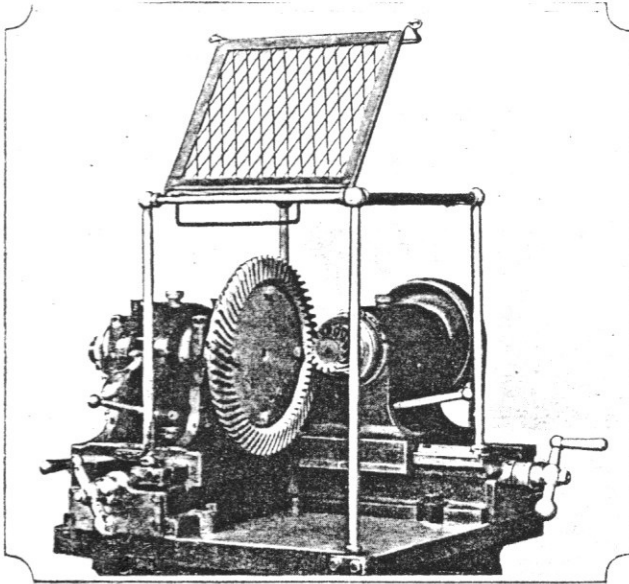
Some of the measures thus taken to ensure the highest refinement of functioning may be instanced.

For every engine a set of connecting

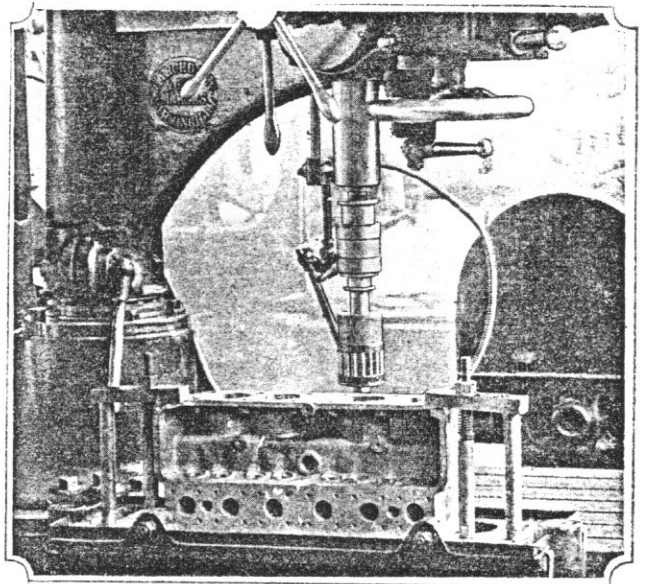
rods, of exactly the same weight each, is made up; this is done by selection and by milling away small portions of metal. Similarly, the perfect running balance of each finished crankshaft is assured. Every assembly of crankshaft, connecting rods and pistons is carefully aligned before it becomes part of the complete engine. Owing to the multiplicity of pieces and dimensions in such an assembly, it is possible for the aggregate effect of minute errors to be considerable from the standpoint of the maker of a high-grade chassis. Complete accuracy is ensured by the alignment check.

In addition to the earlier tests undergone by bevels and gear wheels the complete back-axes and gear-boxes are tested both for silence and manipulation, before being built into the chassis. There is a silence test for the harmonic balancing gear. Lastly, there is the thorough running test which the complete engine undergoes, each engine after this test being taken to pieces and examined.

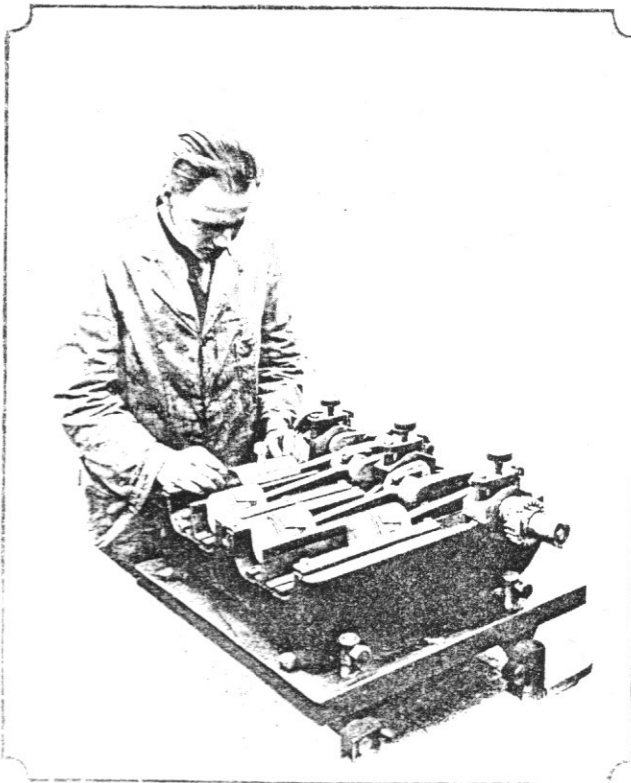
The finished chassis is of course tested on the road, but there is also available an auxiliary indoor test, which provides for any last-moment contingency that may arise. This is the complete chassis-testing equipment, on which a chassis or car can be placed and tested in all its functions (except steering) under conditions that permit of convenient observation. This valuable recent addition to the works equipment makes it possible to test a highly-



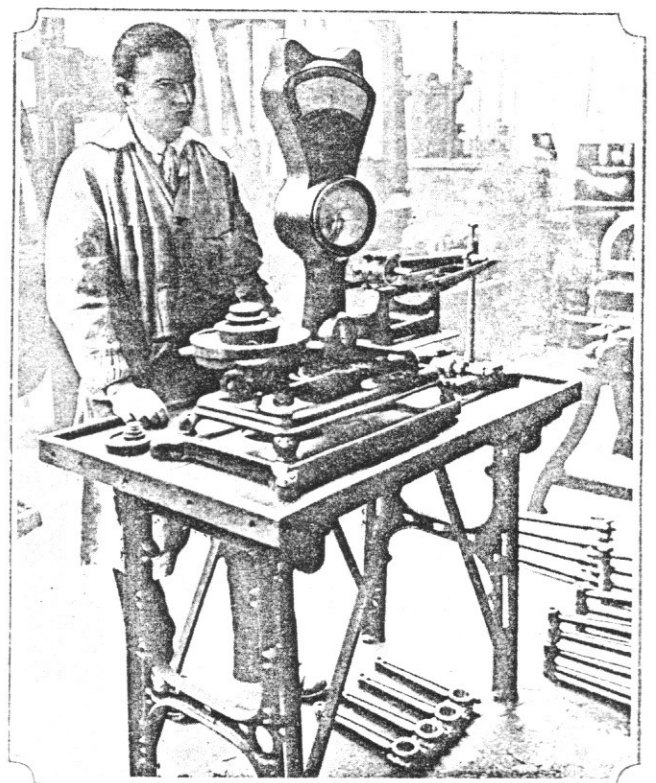
BEVEL TESTING A preliminary silence test before assembly. This machine rotates the bevels in either direction, and a load may be applied to the spindle of the large wheel.



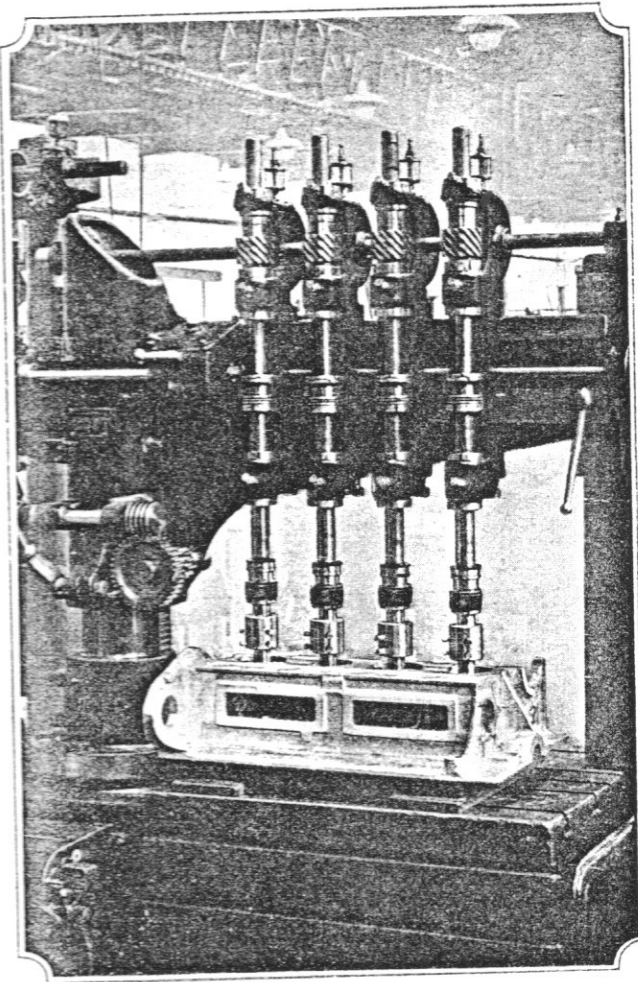
CYLINDER BORING The cylinder bores, after boring and grinding, are burnished into a condition of glass-like smoothness. The jig employed for this purpose is shown.



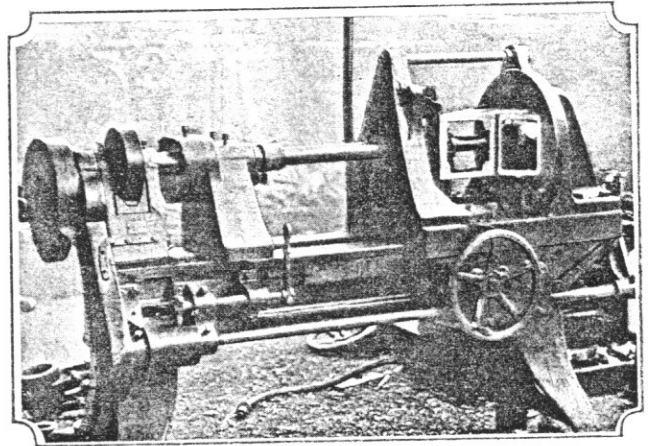
ALIGNMENT CHECK The accurate alignment of each assembly of crankshaft, connecting rods and pistons is ensured by careful test.



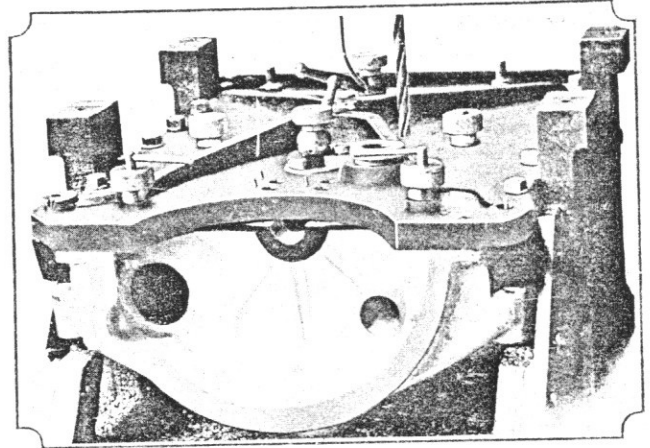
BALANCING CONNECTING RODS A set of four connecting rods of exactly the same weight each is made up for every engine.



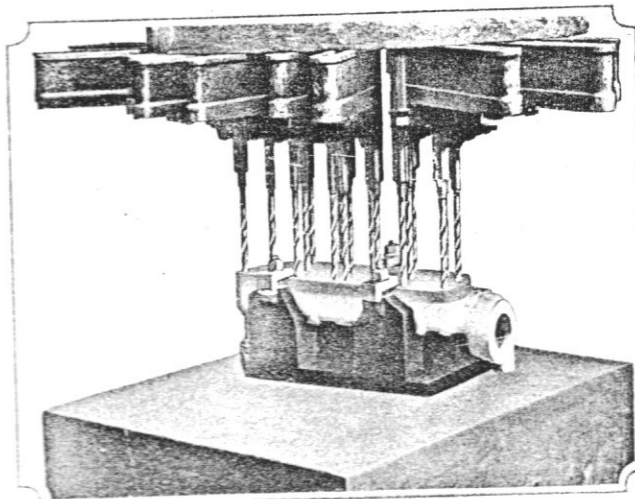
FOUR-SPINDLE DRILLING MACHINE An example of a machine designed and made in the Vauxhall works. The heads being movable it can be used for a variety of heavy drilling work.



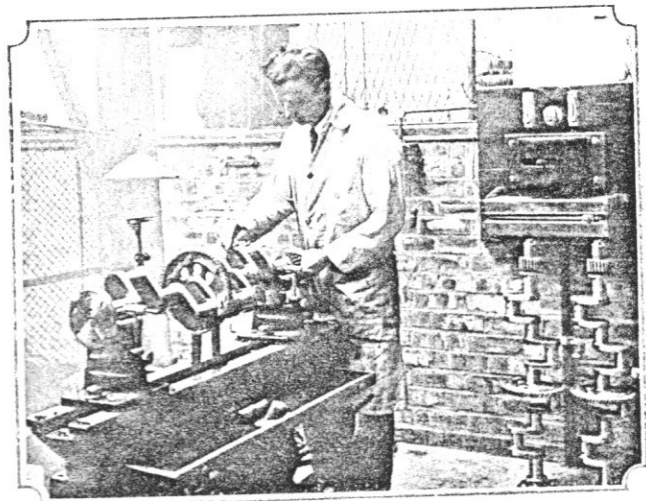
GEAR-BOX BORING MACHINE An example of a single-purpose machine of high precision and rapidity. The gear-box is of the 14-40 h.p. model.



CRANKCASE DRILLING The function of a jig, as a means of securing perfect accuracy in repeated mechanical operations, is well exemplified in this picture.



MULTI-SPINDLE DRILLING MACHINE This machine drills all the holes of the cylinder head at one penetration.



CRANKSHAFT BALANCE The rotary balance of each finished crankshaft is ensured by a delicate testing machine.