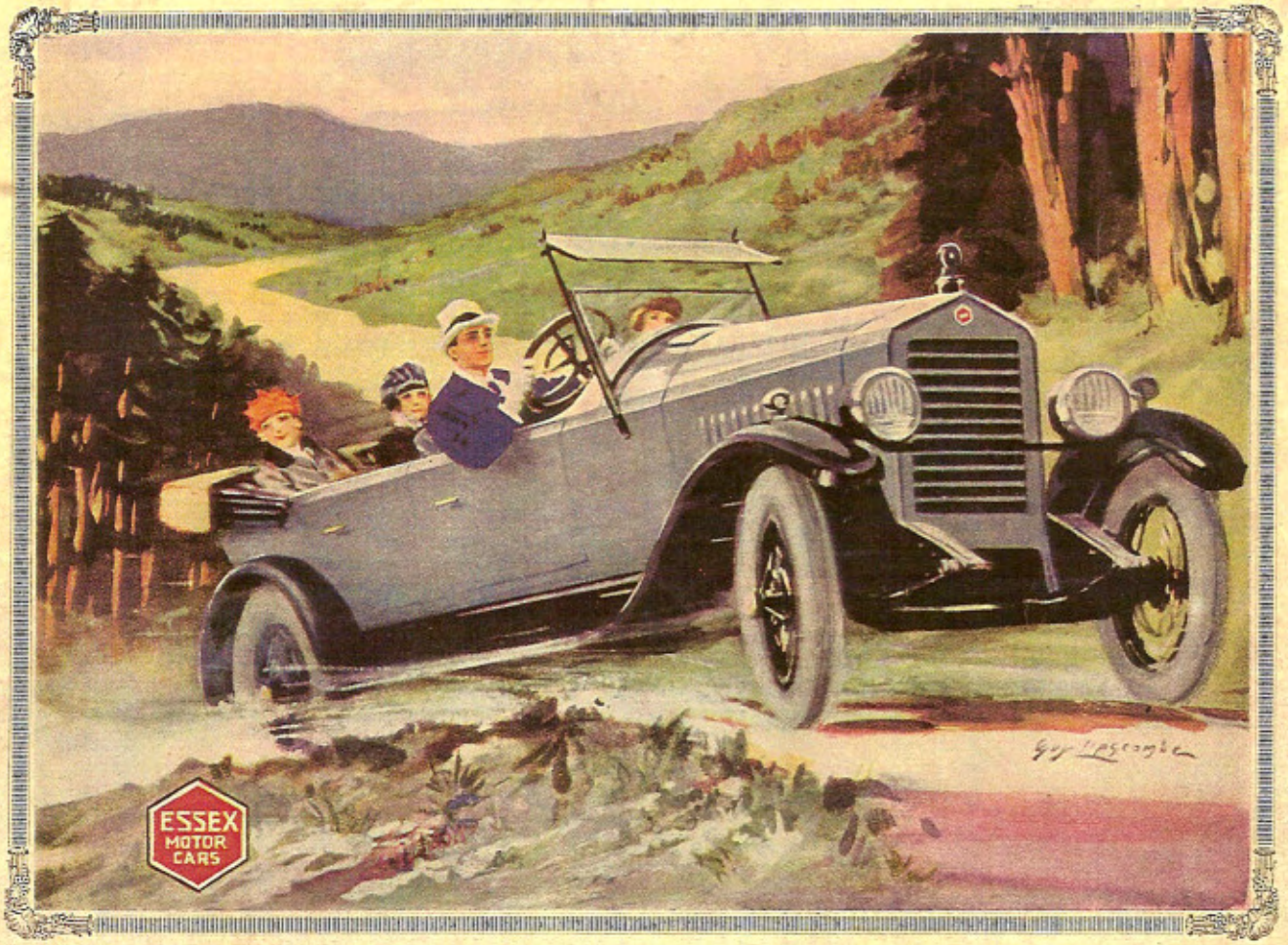
The ESSEX CHASSIS

IN WORD
& PICTURE



Dalgety & Company Ltd.

136-138 PHILLIP STREET :: :: :: SYDNEY.

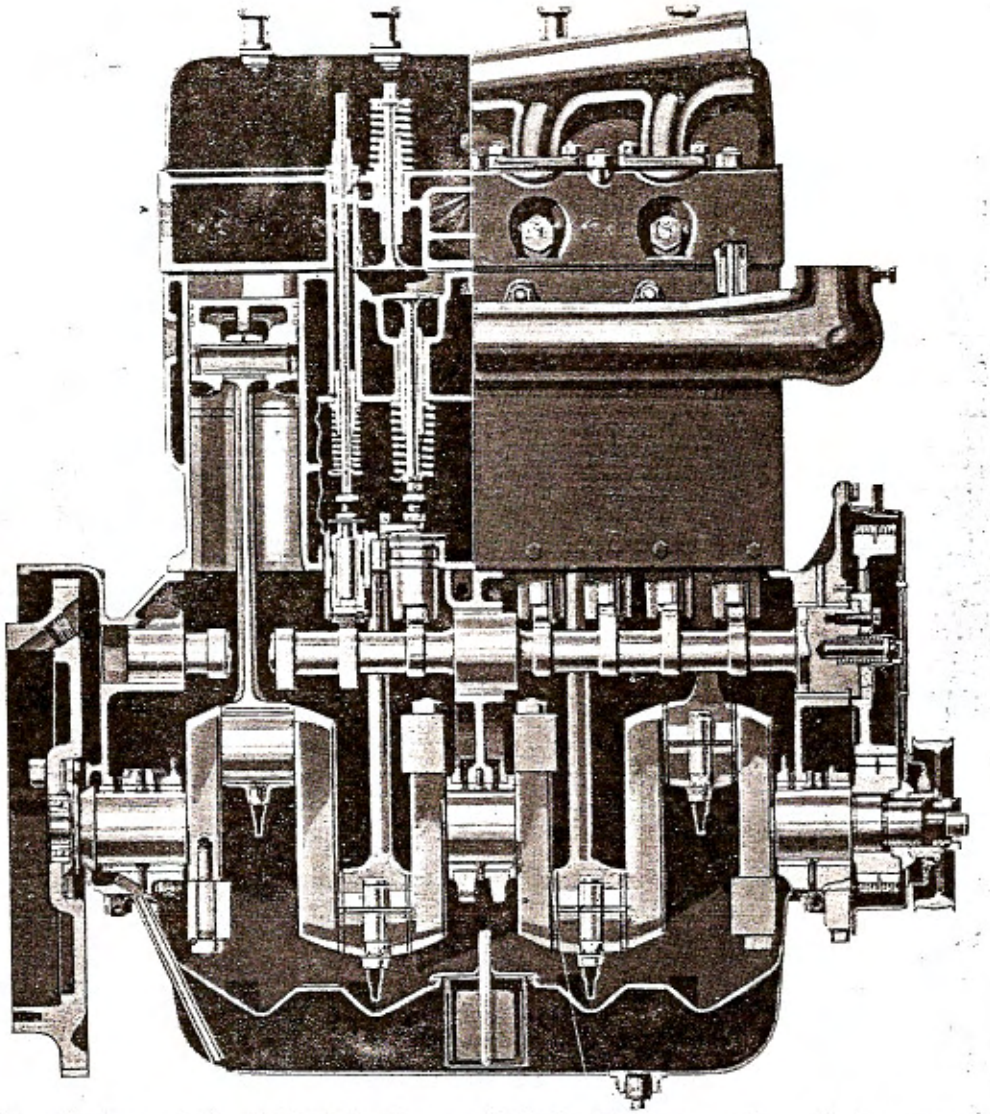
.:. INDEX .:.

Power Plant 1
Engine (End Section) Frame 2
Pistons—Carburettor 3
Combustion Chamber and Timing Gear 4
Valve Guides 5
Overhead Valves—Transmission 6
Cooling System 7
Petrol System—Lubrication System 8
Crank Case—Bearings 8
Clutch—Brakes 9
Front Axle—Rear Axle 10
Universal Joint—Steering Gear 11
Starting, Lighting, Ignition—Crank Shaft 12
Springs 13
Shackles 14
Shackle Bearing Action 15
Accessories, Equipment, etc. 16
S. F. Edge on the Essex 17
E.N.D.'s Opinion of the Essex 18

Complete Specification of the Essex Car.

Power Plant.

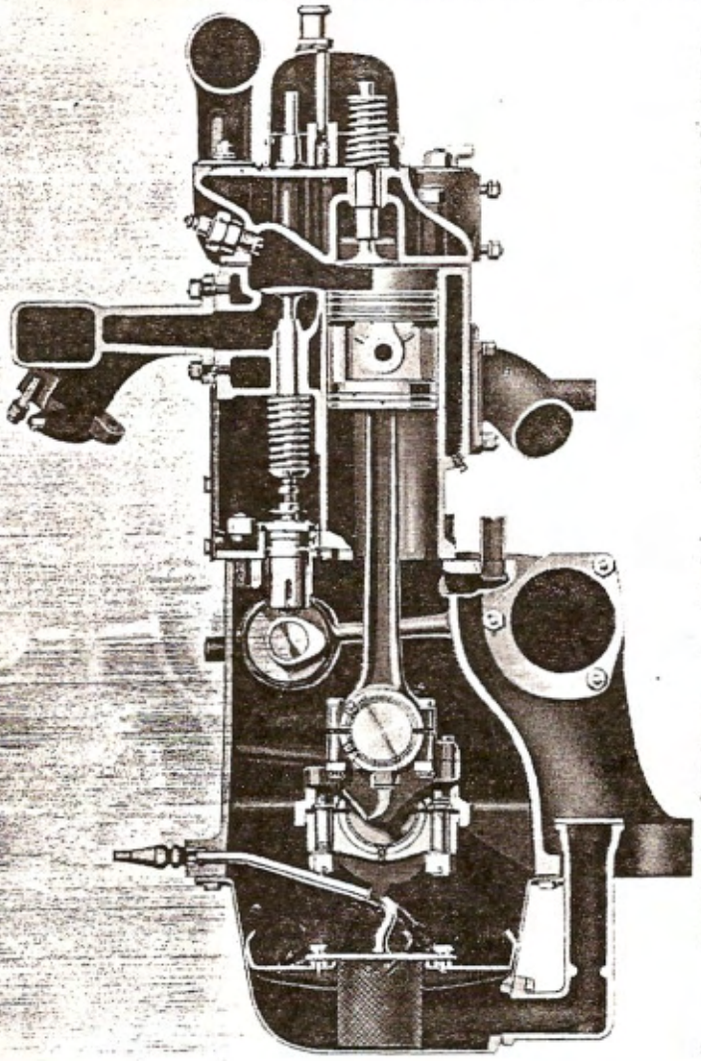
The engine clutch and transmission form a single compact unit. Practically all the working parts are enclosed and are therefore protected from dust and dirt. The rear support takes the form of a cross-member that passes underneath the flywheel housing. This enables the gear-box to be easily detached without disturbing the engine or clutch.



The outstanding feature of the ESSEX is the small high-efficiency engine: It is a marvel of power and acceleration.

ENGINE.

Four cylinders, cast in one block, 3⅜ in. bore x 5 in. stroke (85.725 mm. x 1127 mm.). 179 cubic inches displacement. Tax rating 18.2 h.p., develops over 50 brake horse-power.



Inlet valves in cylinder head, exhaust valves in cylinder block on side. Valves 2 1/16 in. diameter. Cylinder head easily detachable and water cooled, while the carburettor is bolted direct to cylinder head, which contains the intake manifold. The entire combustion chamber is machined, reducing adhesion of carbon. Flow of gas from carburettor is downwards to cylinders, assuring complete and uniform distribution of gases into each cylinder, making easy starting in cold weather, and taking care of low-grade fuels.

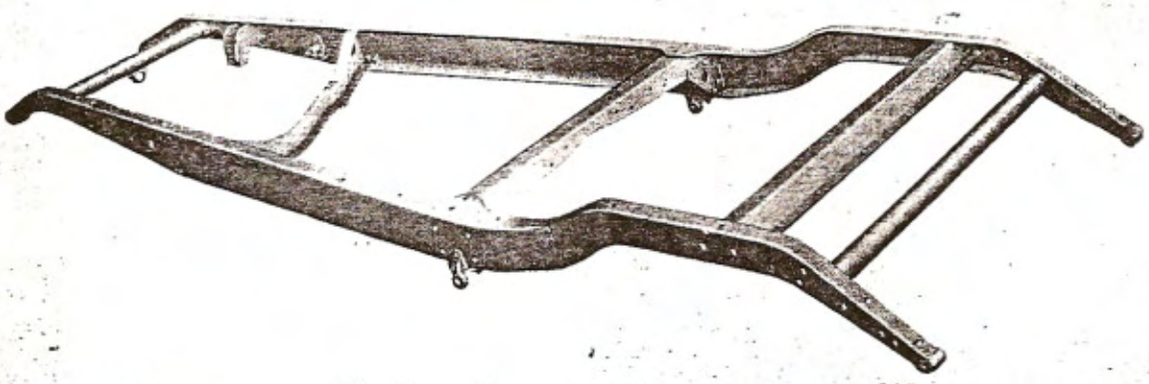
The push rods for the overhead inlet valves pass through the cylinder castings, and each is supported in three specially bushed guides, which can be renewed. The valve rocker arms are supported on large ROLLER bearings (see page 6). The lubrication of these parts is simple and automatic, and whilst the whole mechanism is protected from dust, it is accessible and easily adjusted.

The ESSEX engine is but 29 inches overall in length, and yet it actually gives 55-horse power when required.

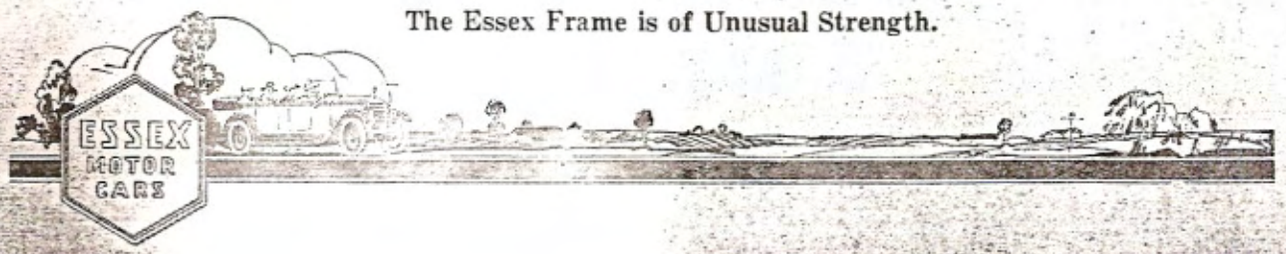
FRAME.

Essex frame construction is of exceptional strength. The frame itself is 6 inches deep, against the usual 4½-inch section in other cars of this size. To prevent any weaving on rough roads the frame is held firmly in square alignment by five cross-members, which are fastened to the side members in a particularly rigid manner. This rigidity saves the body work from strains and stresses occasioned by irregular road surfaces.

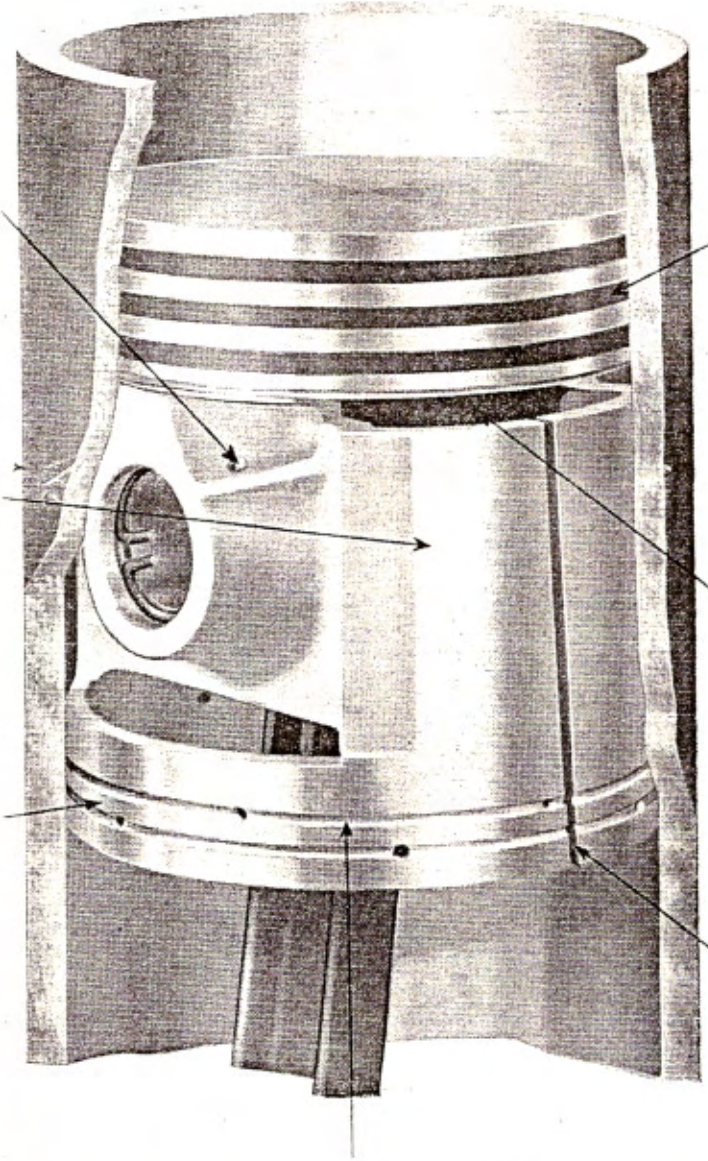
These Essex points will bear comparison with the highest-priced car made, and should be appreciated accordingly.



The Essex Frame is of Unusual Strength.



PISTONS. Aluminium of special patented construction. The new ESSEX piston is one of the features of the car; it eliminates leakage and friction to the greatest possible degree. Expansion is taken care of, so that an accurate fit can be made, and this piston absolutely combines the advantages of cast-iron and aluminium pistons.



Two oil holes in gutter collect oil and deliver it to piston pin.

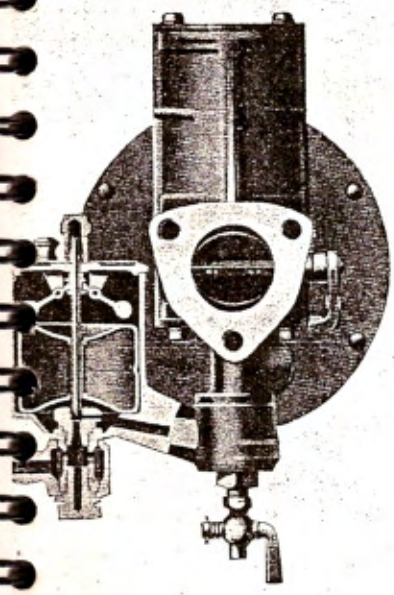
Three rings used at top of piston kept square with walls of cylinder, because piston cannot rock sideways, the clearance being only great enough for an oil film.

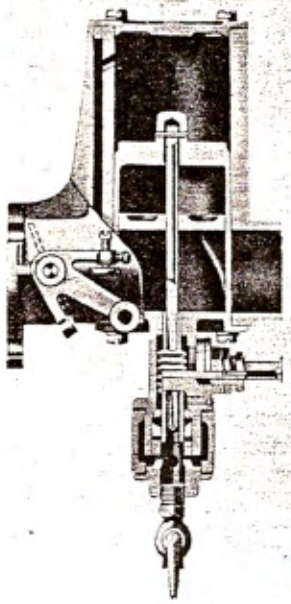
Bearing surfaces take thrust only where necessary, and in close contact at all times, hot or cold.

Upper portion of piston isolated from skirt, allowing unhindered spring action or movement of lower portion.

Circular base of skirt to keep alignment and prevent side action; not a bearing surface, but just a guide.

Slot which allows for expansion when piston is heated.



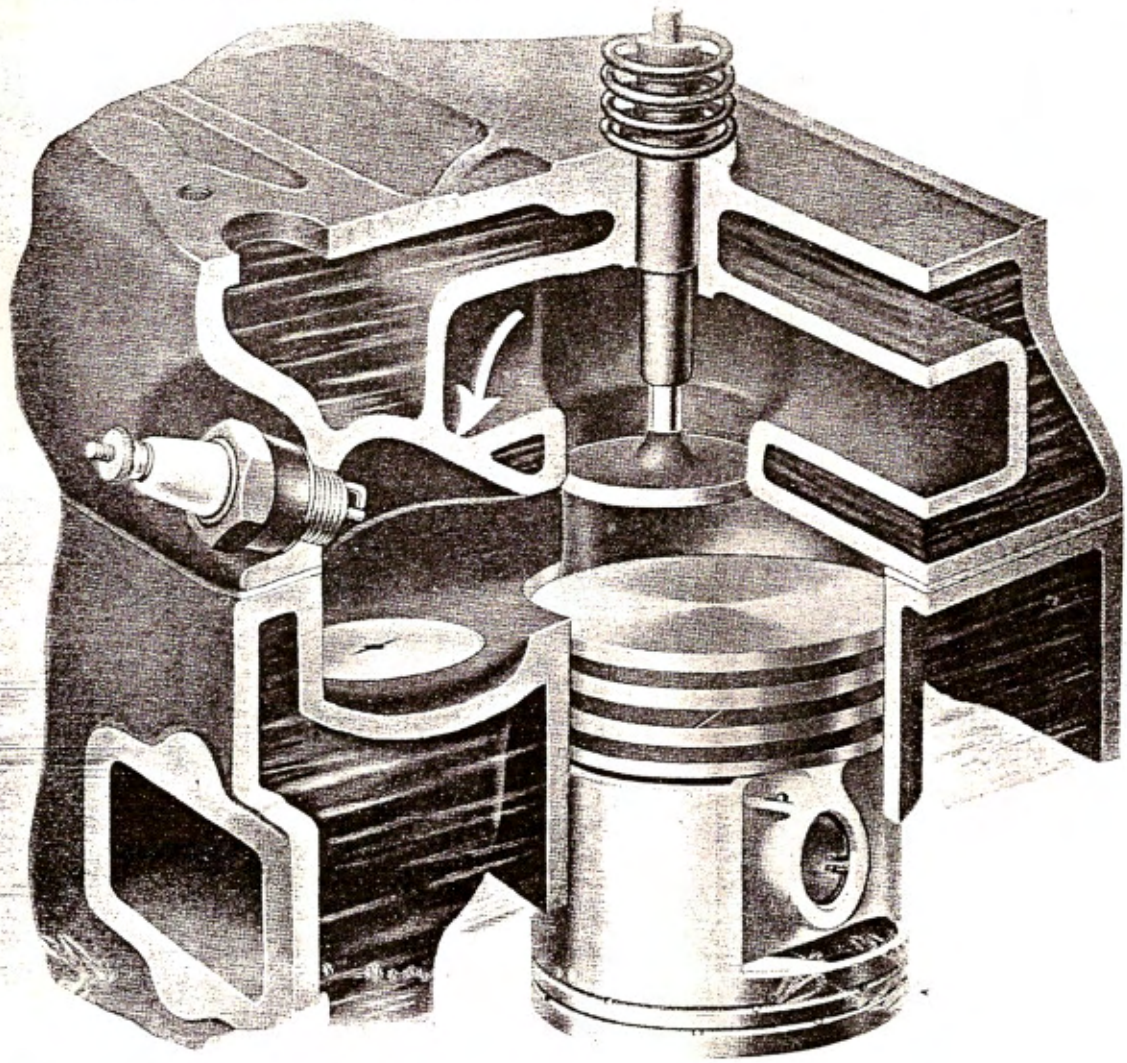


CARBURETTOR. Special Hudson design, patented. Improved type, self-adjusting, yet actually variable from dashboard by driver when desired. Strangler for starting, and air is preheated. This carburettor gives the proper amount of air and petrol at all speeds, and is exceptionally simple and accessible. Jet can be removed and replaced in three minutes. The carburettor is mounted high up on the cylinder-head, so that the mixture is fed by gravity into the cylinders, assuring easy starting.

Essex Carburettor—Unusually Simple and Efficient.

COMBUSTION CHAMBER.

This illustration serves to show the construction of the Essex Cylinder-head and Combustion Chamber, showing how ample space is left for circulation of water ensuring uniform temperature.



This illustration serves to show the position of the spark-plug above the exhaust valve, and pocketed in such a way as to put it beyond reach of any excess oil that may find its way past the piston rings. It is also elevated above the direct inrush of petrol vapour, so that in starting when the whole motor is cold and the vapour is of necessity wet, the spark plug will not come directly in contact with it. The spark plug is out of reach of this wet gas, and can be relied upon not to foul or blacken, even with abnormally rich mixture, when starting.

The illustration in question also serves to show the application of the Essex piston and its relation to the valves and combustion chamber.

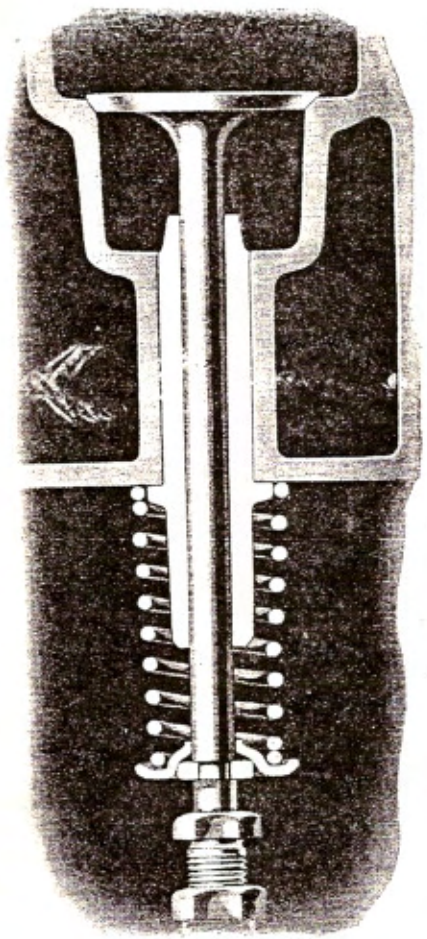
These features in the design of the Essex cylinder and intake passage, coupled with the radiator shutters, hot air intake, and other devices which combine to make the engine so efficient and economical, serve to illustrate many of the reasons why Essex performances are the result of exclusive features not to be found in other motors, in its class, or costing considerably more.

TIMING GEAR.

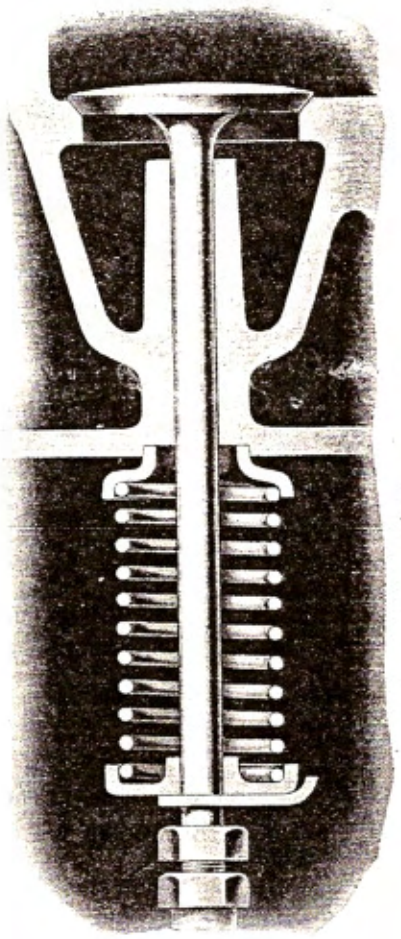
An internal-tooth silent timing chain is used, giving silent positive action, with an accessible adjustment to take up play. This method is also used in the Hudson.

VALVE GUIDES.

The Essex Valve Guides are removable.



A



B

Illustration A shows the Essex Removable Valve Guide; on the right (illustration B) is shown the more common type in which the valve guide is part of the cylinder casting.

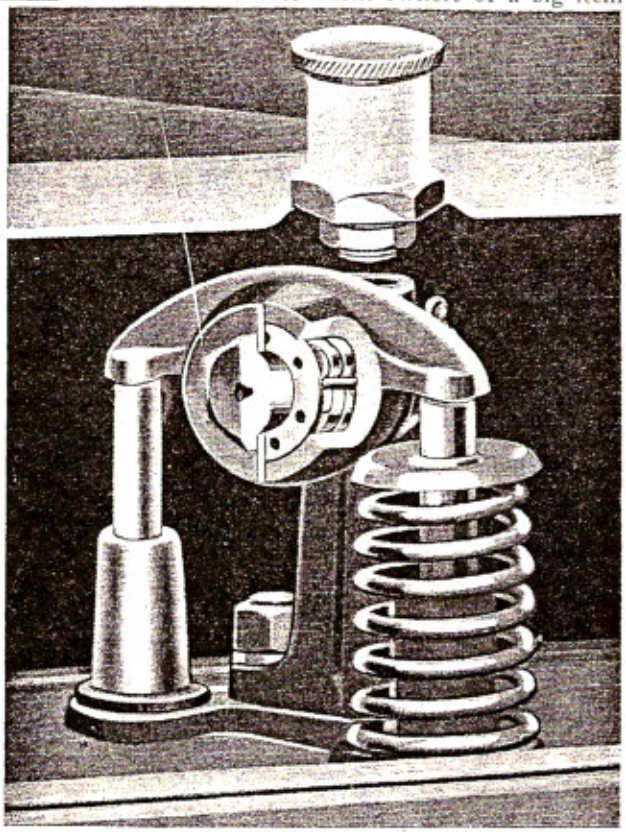
In time, the inner surface of any valve guide wears—the result of valve action; to re-bush the solid type is costly and unsatisfactory. With the Essex removable type, however, a new surface accurately machined can be supplied by simply installing a new guide; thus repairs can be made efficiently at a comparatively low cost. The extra length of Essex valve guides is also important, as it assures proper alignment of the valve, which in turn offsets wear, causing it to last longer.

This Essex removable valve guide feature is another hidden Essex quality.

OVERHEAD VALVES

The Essex valve mechanism is the only one using an anti-friction bearing. This feature relieves Essex owners of a big item of replacement expense, and ensures longest possible life to valve mechanism.

Bearing—a plain bushing such as is ordinarily used.)

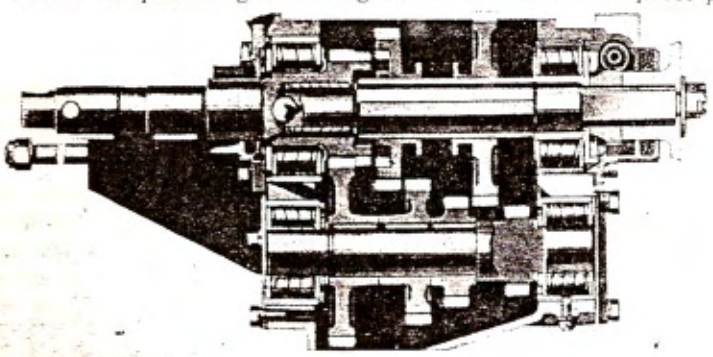


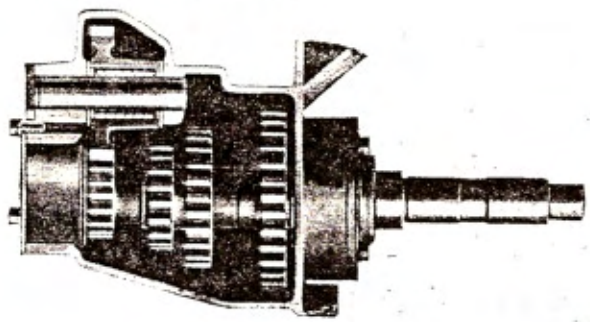
(Actual size of Roller Bearing used in the Essex)

This illustration depicts the Essex overhead valve mechanism, which is far superior to other cars of equal, or somewhat higher, price.

TRANSMISSION.

Is of the selective sliding gear type giving three speeds forward, and reverse. Direct drive on third speed. The gear wheels are exceptionally wide. The gear box, which is made of aluminium, is most compact and accessible, being bolted to the flywheel housing, and can readily be detached by unscrewing four nuts, whilst the engine suspension is not disturbed, as it rests on the cross member beneath the flywheel housing. The gear lever is beautifully finished in nickel-plated spring steel, and is longer than usual, being particularly handy to the driver, yet out of the way of a third person in the front seat. It is situated in the centre of the car, which has the mechanical advantage of doing its work absolutely direct, and the virtue of affording a perfectly clear doorway on the driver's side. It has a rocking gate with dust-excluding hood. A positive gear-locking device affords a thief-proof protection for Essex owners.

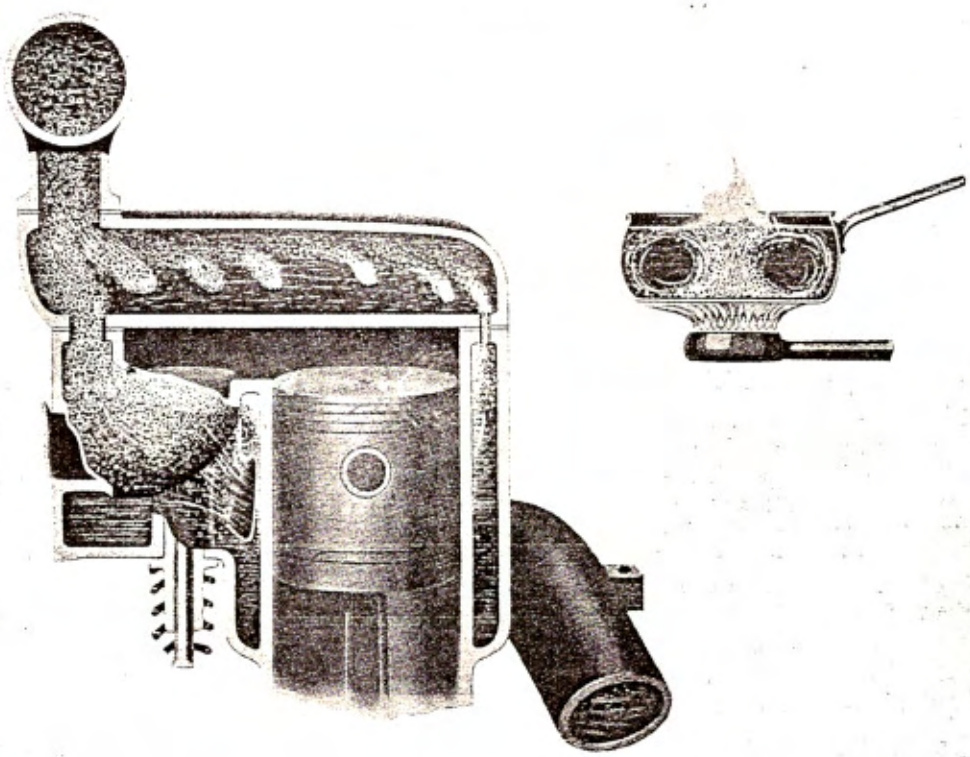




COOLING SYSTEM.

Of great importance to Australian users.
The Essex cooling system is patented.

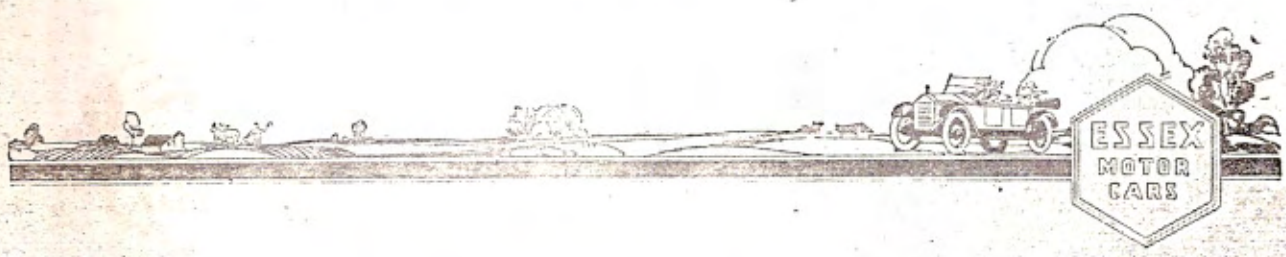
Few cars enjoy such a trouble-free and efficient cooling system as that of The Essex.



The basic principle is thermo-syphon, which means the automatic movement of the water by its temperature. Most people are aware of the fact that hot water rises because it is lighter than cold water. The boiling of water in a pan is the best demonstration of this principle. The more observant have noticed that it rises or circulates more rapidly where the heat is greatest (see illustration of pan and gas burner).

In an engine the greatest heat generated is found at the point where it is not dissipated—that is, the exhaust side of the combustion chamber and the exhaust valve pocket—consequently the water on this side will heat more rapidly. To meet this the Essex cooling system has been designed so that where the heat is greatest the water will circulate faster than where the heat is not so great. This has been accomplished by varying the size of the holes through which the water has to circulate so that on the intake or cool side the holes are smaller, restricting the circulation, while on the exhaust side the holes are larger, thus stabilising the temperature to approximately the same all over the engine.

The outlet pipe is directly above each point of maximum flow, so that the circulation will be in one direction only, with no turmoil or back circulation within the cylinder jacket itself. In this way the water can be made to circulate just as fast as could be accomplished with a pump. The efficiency of this system lies in the fact that the engine cooling water does not circulate until it heats, consequently there is practically no wasted time in heating up to the most efficient temperature. Secondly, when warmed up the entire cylinder head is kept at the maximum temperature with no overheated spots tocause trouble.

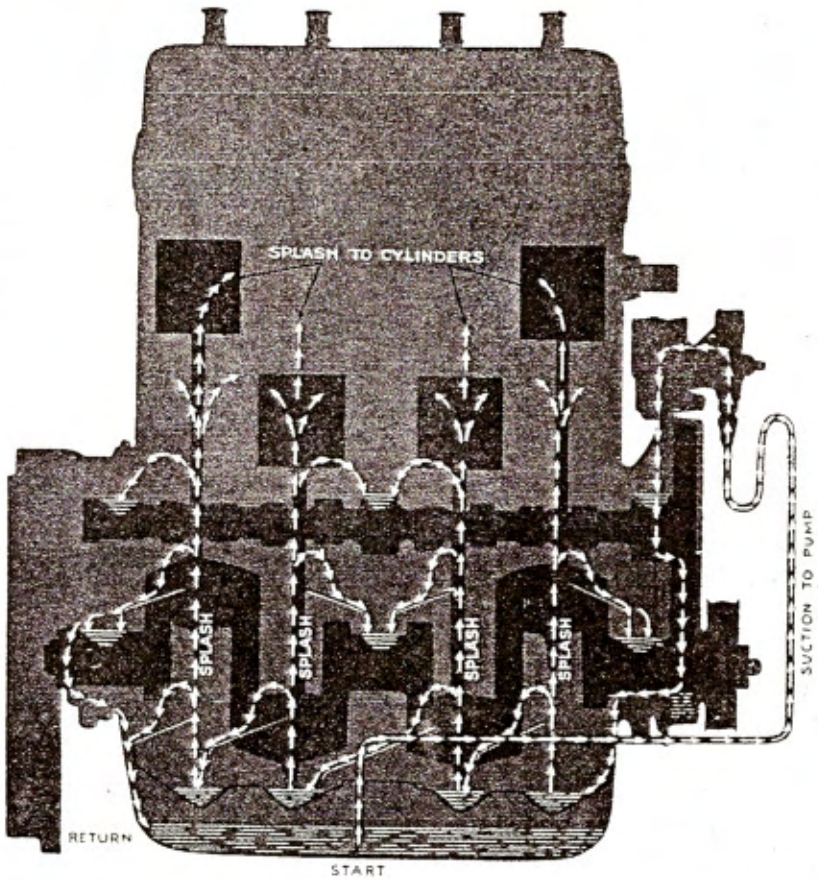


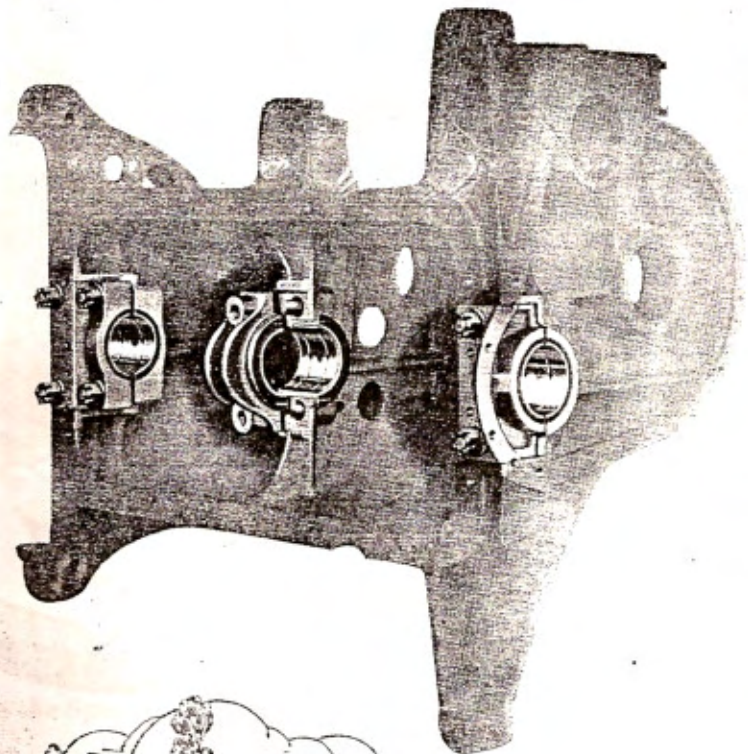
PETROL SYSTEM.

Vacuum tank on dashboard draws petrol from ten-gallon tank at rear of chassis, which is mounted on rear cross-member. This tank has a convenient level gauge, whilst the filler vent is very accessible. The petrol is thoroughly strained before reaching the carburettor.

LUBRICATION SYSTEM.

Extremely simple and convenient. The filler and level indicator are together on one side of crank-case. An accessible pump maintains a constant level in troughs below the connecting rods, and supplies the timing chain and bearings. The general lubrication of the cylinders, etc, is effected by dippers on the connecting rods which, splashing the oil from the troughs, maintain a continuous heavy fog of oil inside the engine all the time it is running. A simple and ingenious arrangement provides an increased flow of oil automatically when the throttle is opened. An oil pressure gauge is on the dashboard.





The Essex lubrication system is so efficient that the working parts are continually moving in a veritable "fog" of oil.

CRANK CASE.

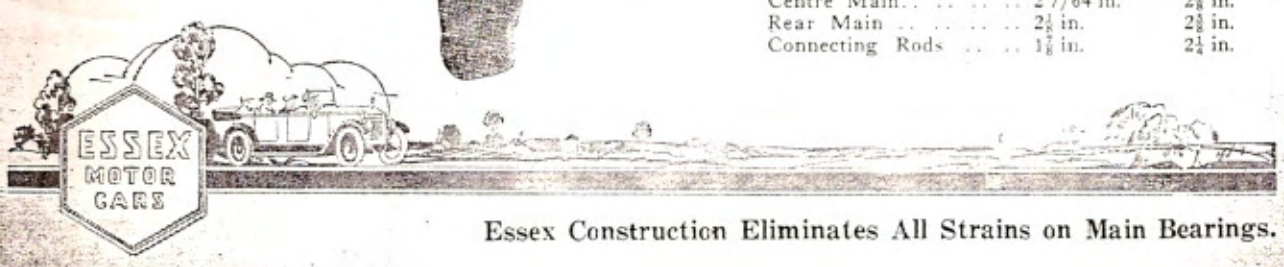
Essex Crank Case is of aluminium, which bolts on to cylinder block, whereas the usual construction, even in cars of much higher price, is to combine crank case and cylinder block in one unit. The method of anchoring bearings keeps them in perfect alignment under all strains, and materially assists in reducing engine vibration.

BEARINGS.

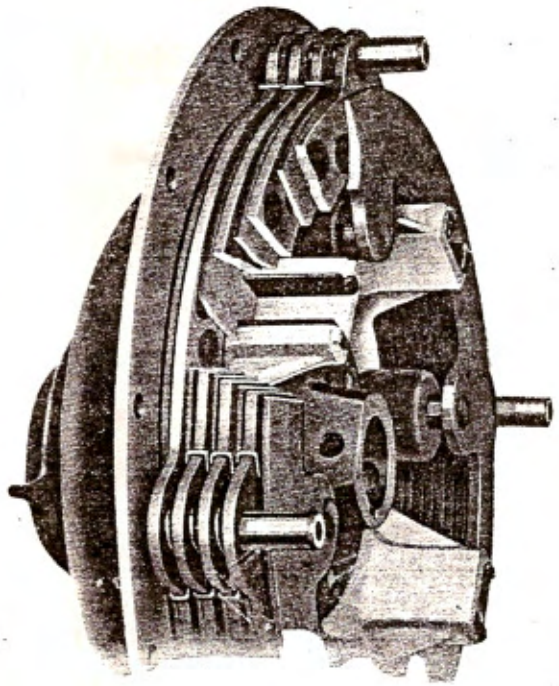
The same make of bearings used by Essex are used in Rolls Royce. They are bronze-backed, and of generous size.

BEARING MEASUREMENTS.

	Diameter.	Length.
Front Main	2 3/32 in.	2¼ in.
Centre Main	2 7/64 in.	2⅛ in.
Rear Main	2¼ in.	2⅜ in.
Connecting Rods	1⅞ in.	2¼ in.



Essex Construction Eliminates All Strains on Main Bearings.



CLUTCH.

One of the outstanding ESSEX features, a time-tested clutch. Smooth starting. Quiet gear changing. Long life. Saving in wear and tear. OIL soaked cork, sliding smoothly upon polished steel, is the principle of the Essex clutch which has been used by Hudson engineers for over twelve years, and is in active use in more than 300,000 cars of their manufacture.

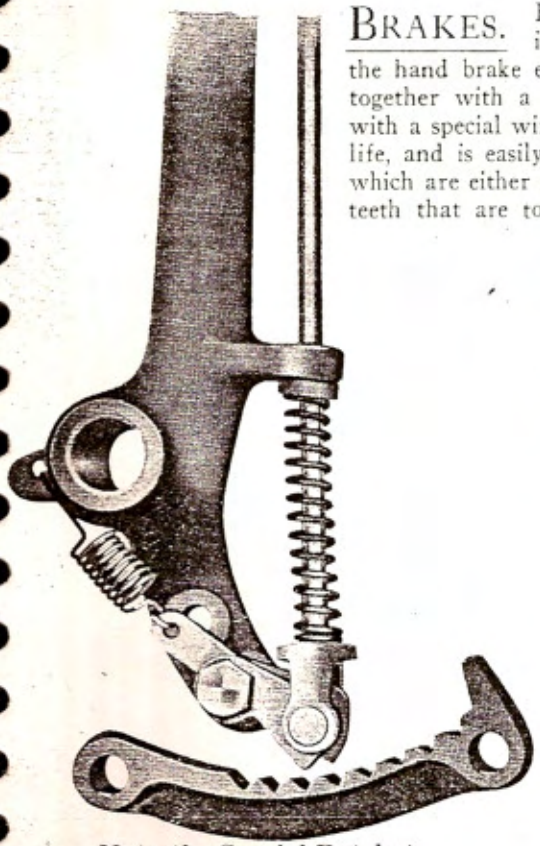
In the disengaged position both surfaces are covered with a film of oil; as contact is effected, a certain amount of slippage occurs, the engagement being gradual, resulting in smooth starting.

Wear is minimised for the reason that the surfaces are protected from wear by the oily film always present during the period of engagement, and the clutch-bearing area is ample, there being no less than 408 points of contact. Once the clutch is engaged it holds relentlessly, and will transmit the full power of the engine.

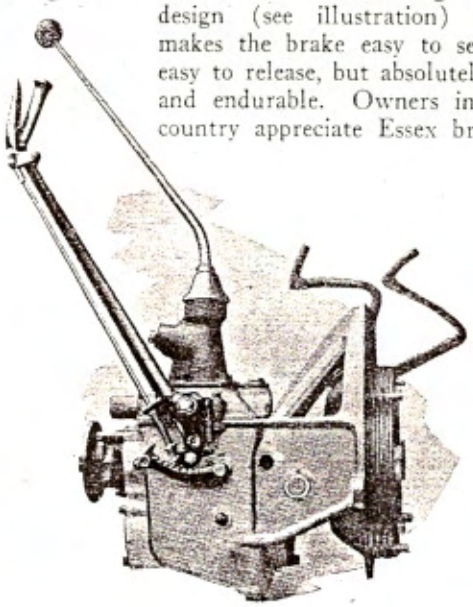
The Essex Clutch is similar to that in the Hudson Super-Six, which has remained almost un-altered for the last twelve years.

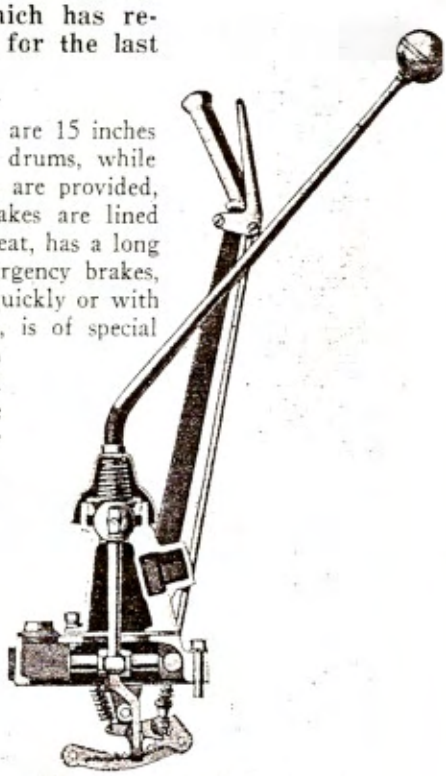
BRAKES.

Both brakes act on the rear wheel drums, which are 15 inches in diameter. The foot brake contracts on the drums, while the hand brake expands on the inside. Convenient adjustments are provided, together with a proper and effective equalising gear. The brakes are lined with a special wire-woven fabric which is not easily effected by heat, has a long life, and is easily renewed. The hand brake, unlike most emergency brakes, which are either fitted with small ratchet teeth which wear out quickly or with teeth that are too big and will never catch in the right place, is of special design (see illustration) which makes the brake easy to set and easy to release, but absolutely safe and endurable. Owners in hilly country appreciate Essex brakes.

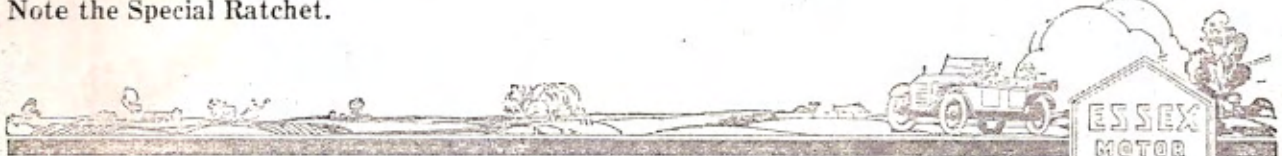


Note the Special Ratchet.





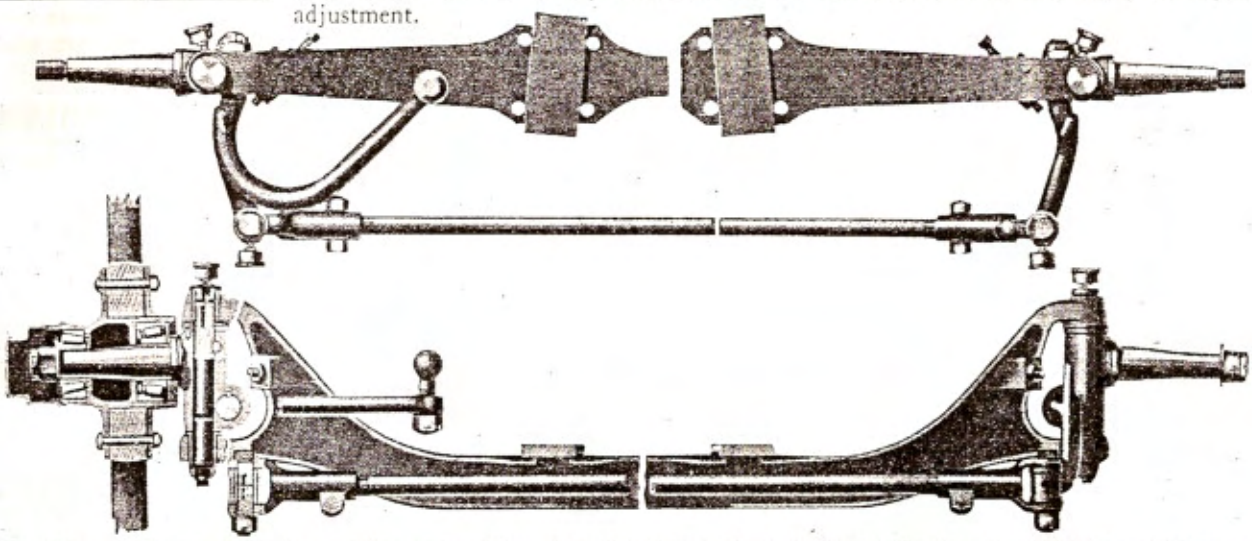
The effect of bad gear changing by a poor driver is minimised by the resilient spring-steel gear lever.



Freedom from Water-pump Trouble is an Essex Feature.

Front Axle.

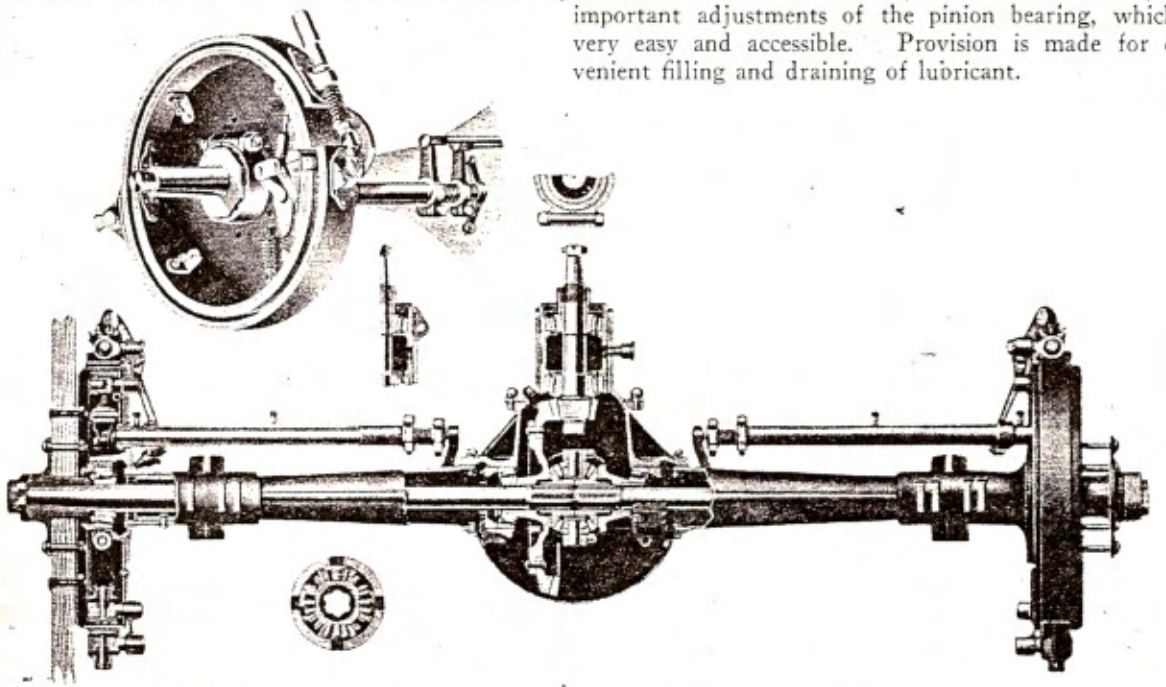
Of the conventional I-beam variety. Steering pins run in bushes, and have bronze thrusts; the tie rod is adjustable so that the front wheels can very easily be kept in adjustment.



The Essex Front Axle is amply proportioned to do its work satisfactorily for the lifetime of the car.

Rear Axle.

One of the strongest features of the Chassis. The housing is of reinforced pressed steel in two halves welded together. It forms one solid piece right across the full width of the chassis, which is the strongest design. The driving gears and differential are mounted on a separate carrier which is bolted to the axle housing, being easily removable through a large inspection door at rear without taking axle from under car. Crown and pinion are extra strong, having helical teeth for silent running. Timken roller bearings being used throughout, and ample provision is made for adjustments, particularly the important adjustments of the pinion bearing, which is very easy and accessible. Provision is made for convenient filling and draining of lubricant.



The Essex Rear Axle is Noteworthy for its Sturdiness.

UNIVERSAL JOINTS.

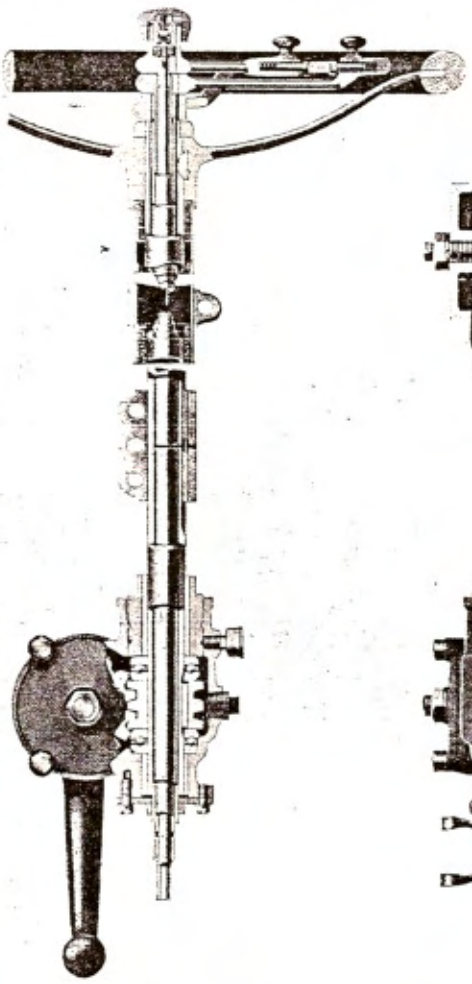
There is a universal joint at each end of the driving shaft of the ring and yoke type, so that the important gear box and pinion bearing are relieved of all stresses except the actual work they are designed to do. The patent steel socket housing excludes all dust and retains the lubricant.

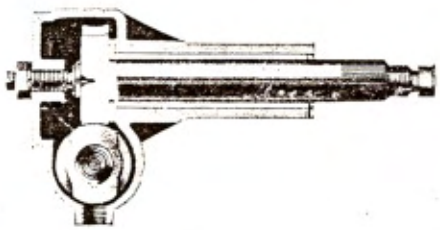
STEERING GEAR.

Is the worm and gear type, very strong. Full gear and shaft in one piece. Adjustable to take up ordinary wear, both in the worm and gear. The steering rod and arms are very strong, and adjustable, and the ball joints have leather covers to exclude dust.

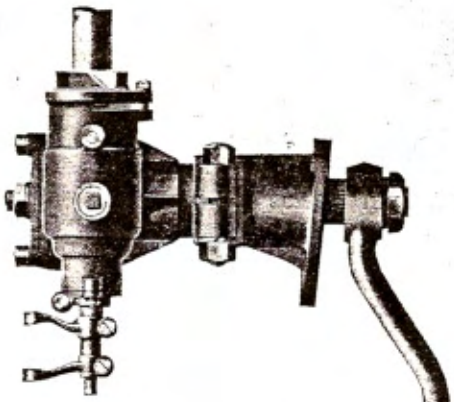
The rake of the steering column is adjustable at the dashboard, so that it can be altered to suit the stature of different drivers.

Steering column, Steering column, showing throttle control, etc.





Eccentric bushing, showing adjustment for taking up end play.



Steering box unit.

Showing action of worm gear.

No part in a car has greater responsibility than the Steering Gear. An unusually large margin of safety has been allowed in this part by Essex designers.

STARTING, LIGHTING AND IGNITION.

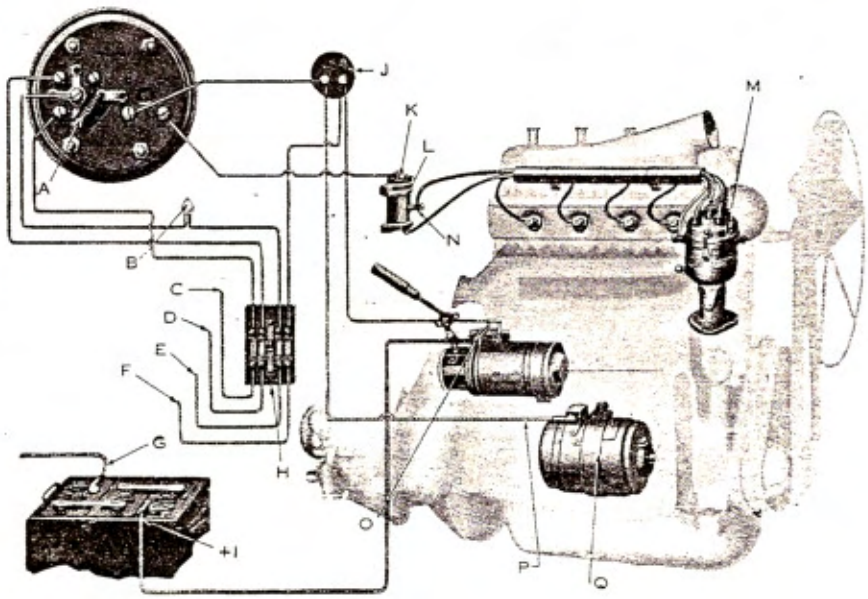
Possibly the Electrical System for starting and lighting in a motor car holds the greatest terrors for the unmechanical prospective purchaser, until he finds by experience that his fears are groundless. The Essex Ignition System is manufactured by the well-known American Bosch Company, and represents the last word in utility, simplicity, and efficiency, while adjustments are in accessible positions. The Ignition is equipped with a unique type of automatic governor to give the required advance for high speeds.

A special feature is that in the event of the coil burning out (a most unlikely happening), the winding can be removed and a new unit fitted in a few minutes, whereas with the old conventional coil, should a break-down occur, the whole thing would have to be scrapped. We would refer you to our diagram which shows the simplicity of the whole unit.

The Generator is protected by means of a fuse and a cut-out, and each of the circuits are fitted with a fuse to prevent damage to the wires in case of over-loading.

Aluminium spark lever, together with horn button and throttle lever, are conveniently situated on steering wheel.

A Headlight dimmer coil.
B Cowl light.
C Head-lamp.
D Side lamps.
E Tail-lamp.
F Horn.
G Ground wire.
H Fuse-box.
I Positive wire.



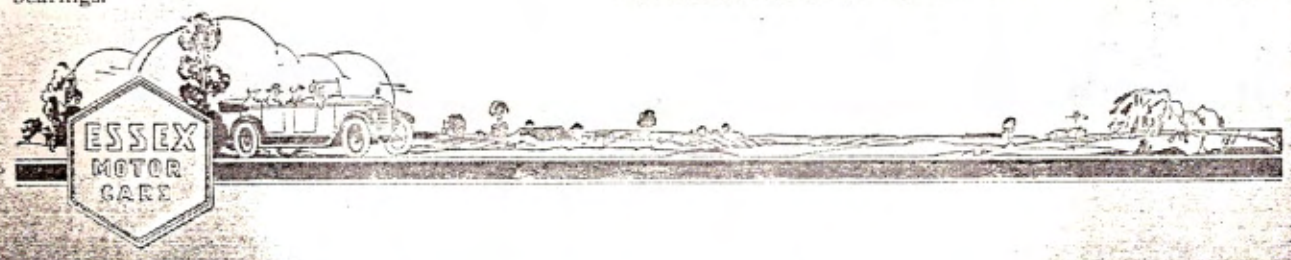
J Ammeter.
K Resistance coil wire.
L Coil.
M Distributor.
N High - tension terminal.
O Starter switch.
P Charging wire.
Q Generator.

CRANKSHAFT.

Special HUDSON patented design scientifically counter-balanced, giving static and running balance at all engine speeds. Crankshaft distortion is eliminated. Three heavy bronze-backed bearings; front 2 3/32 in. diameter x 2¼ in. long.. Centre 2 7/64 in. diameter x 2⅛ in. Rear 2⅛in. in diameter x 2⅜ in. Cams are integral in shaft, and run in four nickel babbit bearings. The 11¾ in. bearing rods are very strong, with babbet line big-end bearings.

The Essex Crankshaft is scientifically balanced to give perfect balance while engine is stationary or running.

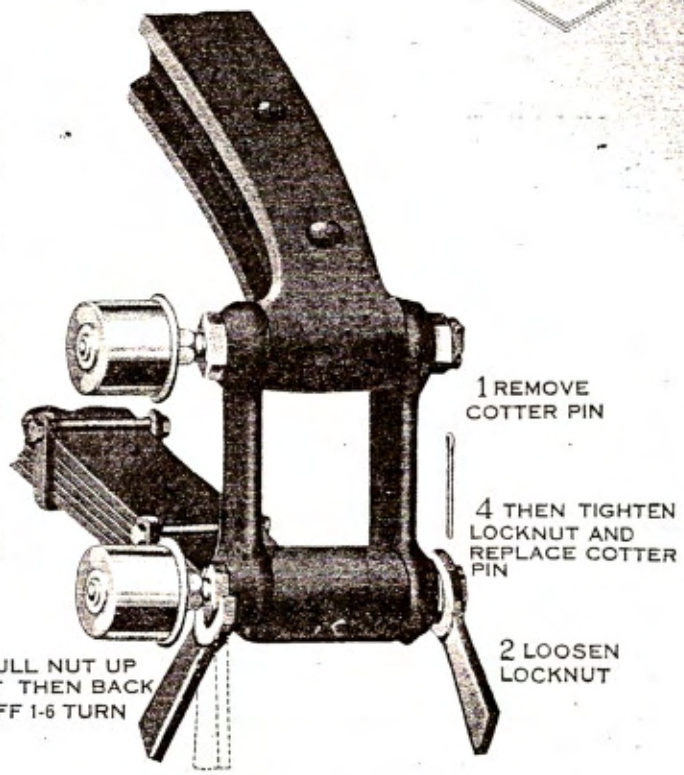
The Essex Electrical System is Reliable and Simple.



SPRINGS. Semi-eliptic, heat-treated, of great length, affording exceptionally easy riding qualities. Front 36in. long, rear 54in. long, width 2in. The spring eyes are equipped with phosphor bronze bushes.

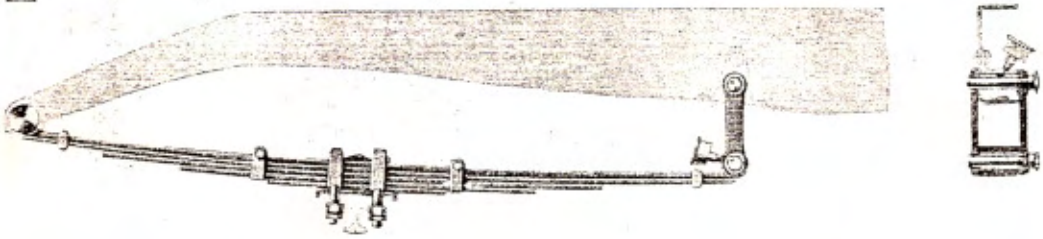
Spring rattles have been eliminated by means of special shackle adjustments, easily made, which keep the shackle bolts firmly in place, also materially reducing wear and tear.

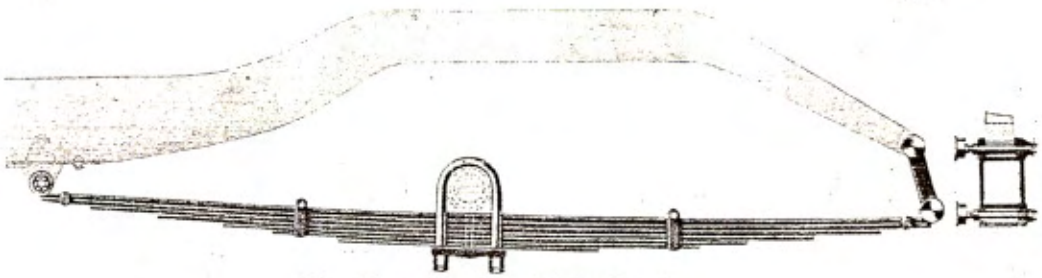
The simplicity of this method of adjustment of Essex Springs with the perfection of its action is a factor of economy not to be disregarded.



Method of Adjustment.

The Front Spring, 36 inches long.

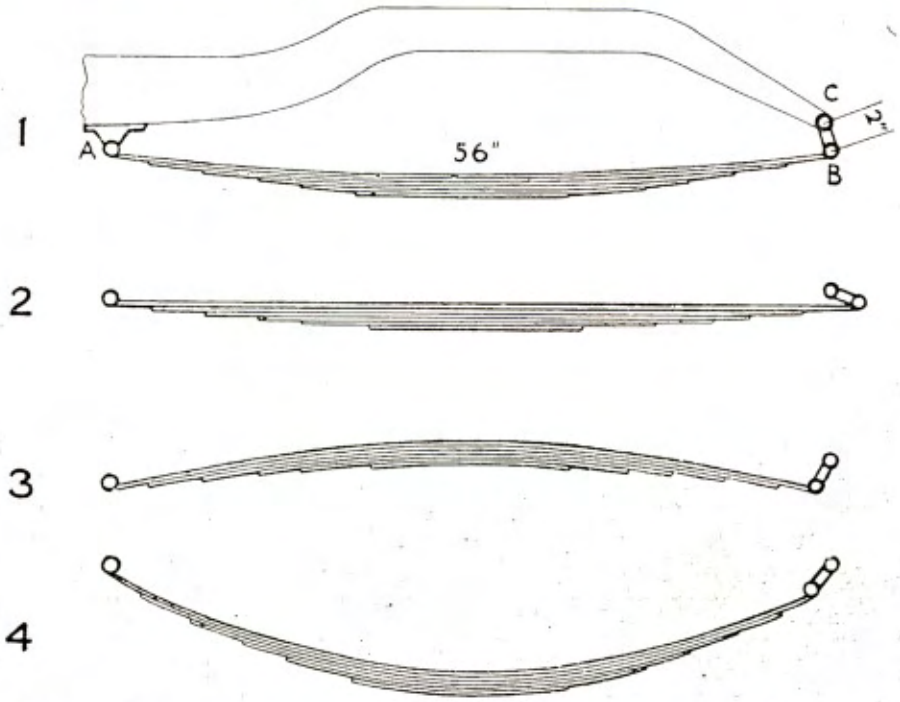




The Rear Spring, 54 inches long.

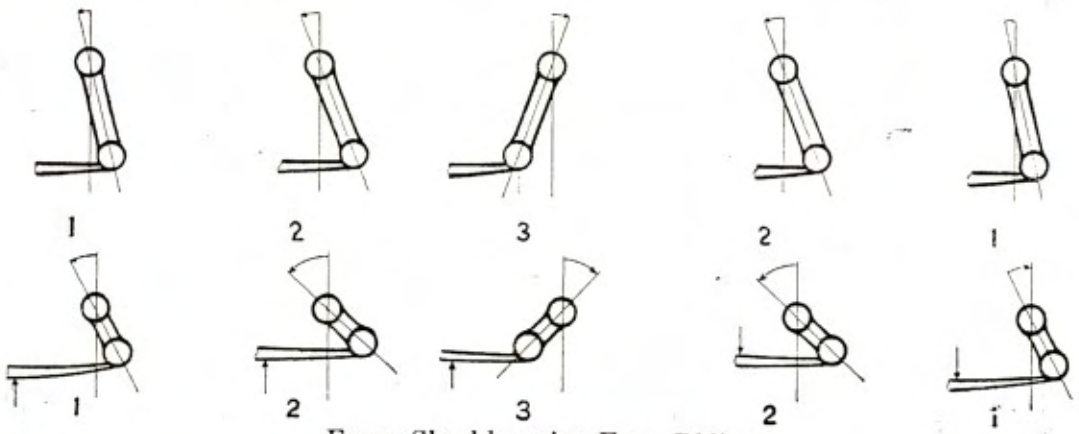
Essex Shackles give Easy Riding and No Rattles.

Have you ever considered why ESSEX uses such long spring shackles —why they are longer than is seen on most cars?



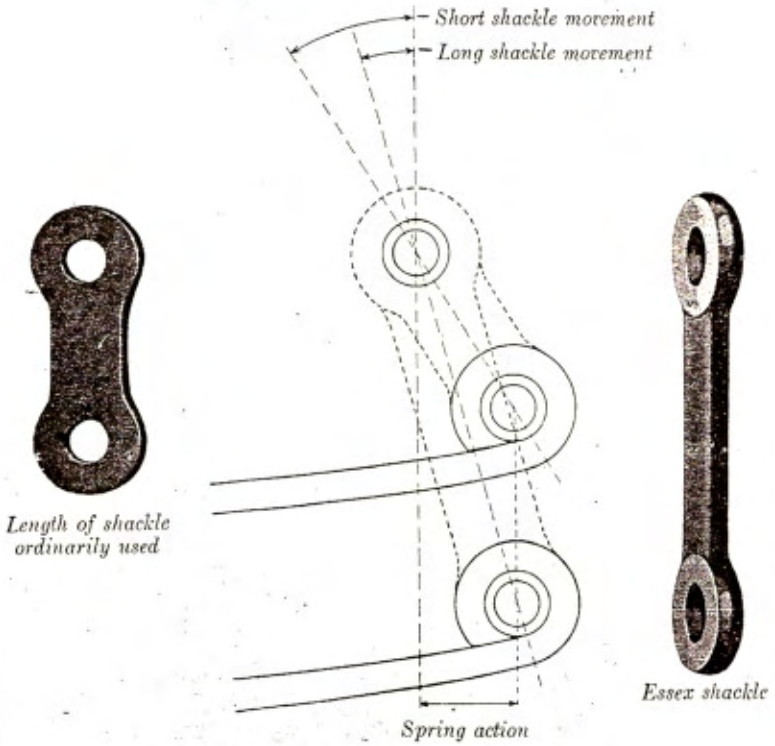
Study the diagram above. This represents a 56-inch spring and a 2-inch shackle—2 inches from centre to centre of the shackle bolts.

This spring is working all the time—up and down—according to the nature of the road and the load in the car. The distance between "A" and "B" is always changing as the spring bends; but the points "A" and "C" never change; so all the movement is at "B." In short, one end of the spring must be free. But is it *free* unless the shackle is the right length?



Essex Shackles give Easy Riding.

Shackle Bearing Action



See how it is possible for the shackle, by being too short, to actually hold the spring from acting. (Fig. 4.) Then, the pull on the spring-eye becomes terrific and the bearings and shackle bolts cannot possibly stand the strain. Excessive wear and breakage result. Rattles are always developing because you cannot keep the spring shackles adjusted.

Remember that even small deflections, up and down, mean a movement of the spring shackle. First, up: The shackle moves backward as far as it can go until the spring is flat (Fig. 2). Then forward, when the spring deflects as in Fig 3. Then back to Fig. 2 position, and finally down to normal as in Fig. 1.

The shackle does this for each deflection. On the preceding page this action is shown.

The longer we make the shackle, the less will be the movement on the bearings. The tendency to pull against the bearing on the rebound will be reduced in the same proportion, thus:

Remember, springs are working all the time while the car is running. The worse the road the more they work. The long life of the Essex chassis and spring parts is well known; but it is well to explain "why," for comparison, and the illustrations are self-explanatory.

INSTRUMENT BOARD. Is exceptionally complete with all instruments directly in front of the driver's eye. The dash control for petrol shutters and choke being very handy.

VENTILATOR. A very handy and neat ventilator is situated in the centre of the cowl, and is controlled by a nickel-plated hand-screw on the instrument board. When open, this throws a cooling draught directly to the feet of the occupants of the front seat.

HORN. An electric horn placed under the bonnet gives an instantaneous warning note that can be heard at great distances.

BODIES. Can be supplied either imported or Australian standard types. De Luxe models can be supplied at a slightly extra cost varying according to the type and finish.

MUDGUARDS. Are of the latest type of V-dome, made of pressed steel, very strong, and neat in appearance.

SPEEDOMETER. High-class quality, giving speed of car and trip mileage, together with total mileage covered; driven from gear box.

TYRE CARRIER. Situated at rear of car.

TOOLS. Full kit of tools, pump, and jack supplied with car. Also very complete illustrated Iustruction Book.

ESSEX

"The Car that is Light on Tyres"

The Vibrationless Engine, the Perfect Clutch, the Smooth-working Brakes, the Flexible Springing and Correctly-proportioned Wheel-base of the ESSEX are all features that combine to make it one of the lightest Cars on tyres that has ever been built.

Many owners have run over 10,000 miles on Standard Size Tyres.

English Experts Express Admiration for *The* Essex.

The Stamp of Approval by such an Authority as S. F. EDGE.

THERE are several very important motor journals published in the British Isles, and they review motor cars from unbiased and quite exacting viewpoints. It is interesting to note the attitude their writers take when a new American car is introduced.

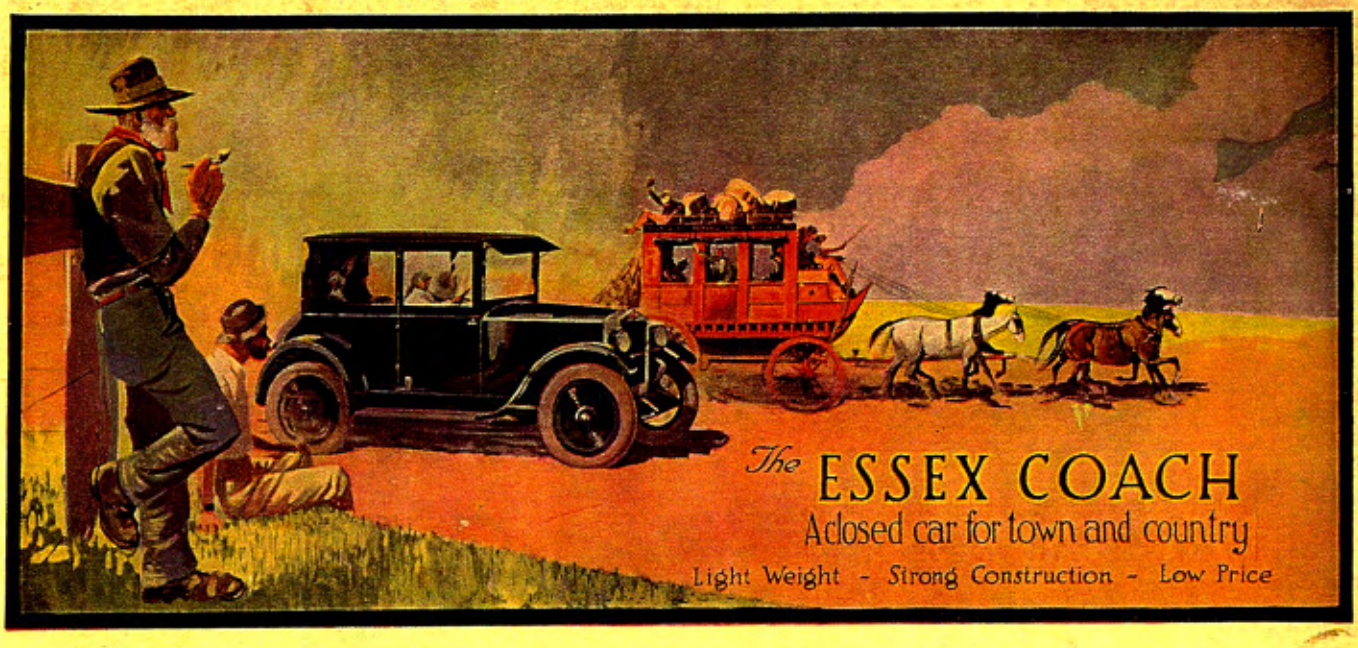
The Essex, of course, had been in their market for some years, but in keeping with their traditions they refrained from commenting on it, except to chronicle in their news columns the many victories it won on their various speedways and in famous hill climbs.

Suddenly, as if the Essex had asserted its right to be criticised, we read the undermentioned about it. The most important story of recent date is that by S. F. Edge, the noted British authority on motor cars. You will probably recall the name in connection with the Hudson twenty-four-hour run, for it was Edge's record that the Hudson shattered. Mr. Edge, writing in the "Autocar," a very prominent trade journal, pays tribute to the Essex. He says:—

"Another of the five cars I used during the last few weeks was one I cannot help mentioning, the four-cylindered Essex, with an R.A.C. rating of 18.4 h.p. It is an American production, with absolutely the brightest, liveliest little engine I have ever found in an American car; in fact, this motor might really have had a Coatalen or a Pomeroy as its sponsor. Quite outside the engine's merits, however, the whole car is good, pleasant to use and striking. The steering is light and easy; the springing is good; the brakes are good; in fact, everything to do with its driving is most satisfactory. The price charged, too, is very reasonable from what is given, by comparison with the prices of other cars.

"The ability of the Essex to climb hills on top-speed, and yet give one a comfortable 45 miles per hour with four people up is unequalled in my experience of four-cylindered cars of the same engine dimensions. It is really surprising that one can still fall across such good cars, quite unexpectedly. I heard of the Essex through a friend who often tells me of swans which turn out to be geese; but I ignore his exaggerations, because there is generally at least one swan-like attribute about anything he commends, and I like enthusiasm, even when it is not altogether disinterested. But in this case my friend had certainly not overstated the facts, and I was most intrigued to find an American "four" of such flexibility, liveliness and substance, notwithstanding its quite moderate all on weight.

"The next day I had a good long trip on a British-built car of about the same seating capacity, but with a slightly larger engine. Although in some matters the British car's design was the better (or perhaps I can more justly say the better in my eyes), its road-performance was not to be compared. In hill climbing, for instance, the home-built car was always a speed (or gear combination) inferior to the Essex. To pick up after slackening of speed one simply had to change down, whereas the Essex was still quite happy on it top speed."



Another English Opinion :

This letter was written when the Essex was selling at over £700:—

In the September 30th issue of "The Auto"—a London motor paper—there appears a very interesting and lengthy story on the Essex, written by a motor-wise Englishman under the initials "E.N.D."

"Like all old stagers, I am constantly changing my politics, so to speak, in the matter of car-nationality. One time and another, after a few hundred miles on a newly-met car, I have mentally decided that England, or France, or Germany, or Belgium, or Switzerland must, after all, be given the credit of turning out THE nicest car I have ever tried. The cars have been—over a period of 16 or 17 years—one, two, three, four, six and eight-cylindered. There have been gems of each type of design, and of each country's fabrication, so that I can say this without bringing tears to the eyes of anybody—from the Marquis De Dion in the one-cylindered category to Mr. Sydney Guy among the "eights." . . . .

"I have seldom felt wildly enthusiastic about American cars, because those I have tested have so often been very nice cars which might have been much nicer cars if another ten pounds, or fifty pounds, had been spent upon their production. But during a short holiday taken recently, I chanced upon the 18.4 h.p. four-cylindered Essex, and to warn off at once those who do not like enthusiasm I may say that, judged by the sample I borrowed for a day during August last, this Essex is a magnificent four-cylindered car, would be that at any price, and is a colossal revelation of the value Americans can offer at its price of £740.

"With the pound sterling at, roughly, 3 dollars 50 cents., as I believe it is, this is a remarkable figure. Look around the British market, seeing what one can buy for less than £740, of equal power (as distinct from mere engine-size) and "turn out" (by which I mean workmanship), and the marvel becomes the more profound. I am not going to say that the Essex is the best value existent, because there are many comparatively new cars most of us have to try. But I don't know anything like it.

"The doors shut without the aid of a railway-porter, and open at the slightest pressure on the (plainly seen, and obviously used) outside T-handles. The body as a whole is excellent. If America will not mind my saying so, it might be an English body, and a good-grade pre-war English body at that. . . .

"This, I think, about exhausts what I noticed, because all but an hour of the time the Essex was in my charge, I was on the move, and during that odd hour I was kept so busy agreeing with one of my passengers (a very experienced test-rider, with the exactingness born of experience) that it really was a most unusual car, and that there must be a crab somewhere, if only we could find it. We searched high and low; in, out and round about. But to no avail.

"Now to the car's behaviour. That loaned to me by Messrs. Shaw and Kilburn, Ltd., was a new specimen, whose speedometer showed about 70 miles' total running when I took it away from Wardour Street. . . .

"Emerging from Wardour Street on to a real road, I found that the engine leapt into revs. admirably, without any hesitation or stagger and de-celerated with equal smoothness. Except for a minute's halt at Hyde Park Corner, I ran to the outskirts of London without getting off the direct-driven third speed. The foot-brakes acted like chamois-leather on polished steel; the hand-brake lever was well within reach. The steering was "new," but pleasantly light and sure, and self-correcting to just the right degree.

"Engine, suspension, steering, body-comfort, position of control devices (the location and construction of the accelerator pedals are especially noteworthy) were alike faultless. In fact, it was impossible to believe that all this satisfaction of performance was purchasable at £740, and that the car had still to run its 250th mile. Value-comparisons have no place here. This Essex may have been a very fortunately-chosen specimen (though certainly new, and equally certainly not the "demonstrator" used to sell Essex cars). But I do not remember at any time, and certainly not in the past six years, driving a more comfortable, delightful, efficient motor-car of four-cylindered type, at any price, than this.

"One can only guess at its endurance, of course. But it looks to be so really and truly built, right through, that I am sure the stuff will be worthy of the design and the workmanship. Given that, it is to-day one of the most remarkable examples of value for money the whole world of car-producing countries can offer, in the London market."

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