May 29, $19: 3$.


# The Ten Horse Power Car with the BIG SIX CYLINDER PERFORMANCE 

"THE MOTOR."
"Although it has a small four-cylinder engine of just over 1,100 c.c., it is comparable in smoothness with many bigger six-cylinder cars. This characteristic is most outstanding. and is pronounced throughout the whole range of engine speeds. .. climbing long hills. . . when one might anticipate a falling away in speed and a change down to second gear, the engine continues to pull in the manner of a six-cylinder job."
"THE AUTOCAR."
"The way in which the car will run as slowly as 5 or 6 m.p.h. on top gear. which is a relatively low ratio, and then accelerate without snatch, or, on the same gear. pull a full load on long main road hills, makes the machine comparable, curiously enough, with not a few six-cylindes cars.

- The engine is most willing, and it is excellent that it will accelerate the whole way up an average main road slope in top gear so as to suggest a six rather than a four.'


## "THE SPHERE."

"On more than one occasion private manufacturers have sent one of their cars down to the track. engaged it in top gear, and set the throttle so that the vehicle ran round in a circle all on its own at a very slow speed. Usually the demonstration is carried out with a car having a $\mathbf{6}$-cylinder engine, but $I$ was able to repeat this performance with this small Peugeot, the speedometer showing 4 m.p.h. 1 am not suggesting that anyone wants to travel at such a slow pace on top gear with a car of this description, but the demonstration served a useful purpose by showing how evenly the tiny engine fired."

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A MAGNIFICENT SPECTACLE.

Playing to a mighty audience-only one section of which can be seen in our photograph-Sir Malcolm Campbell, on Monday last at Brooklands, gave the first exhibition run of "Blue Bird" in this country.

A New Volume.
With this issue we commence a new volume-No. xxxviii. The number of the issue is ?ry. Were getting on!

The Irish G.P.
Only a week to the first day's race of the Irish International Grand Prix. l'honix Park, Dublin, is again the wenue :and :lthough the entry is " dowu," the race promises to be a line one.

## The Holiday.

Owing to the uncertain weather, last Monday looked like being a " hank" holiday. but at the last moment the Clerk of the Weather relented and Jiank Iloliday proved to be one of the finest on record.

## Sporting Events.

Drivers in the "Edinburgh" were Preated to weather which. like the collate's eqg, was good in parts. For the most part, however, the conditions were very unjleasant. Brooklands, by way of contrast, basked in real summer sunshine.

## Directing Traffic.

The volume of traftic on Monday probably beat all records, and it is gratifying to be able to claim that there were fewer accidents than ever before. "Speed cops" found, in many cases, that they could direct tratic far hetter by sitting stationary astride their motoreycles by the side of the road.

No. 964. VOL. XXXVIII.

## NEWS of the WEEK

On the threshold of fresh developments (page 4).

Rileys adopt four carburetters on new racers (page 6).

Get to know the Austin Sports. All about a very attractive little two-seater (page 10 ).

The truth about the " Edinburgh." Eye-withess accounts by members of our staft (bages 1:-17).

Jrooklands broke all records for attend last Monciay. A light car carried off the Gold Ntiur (centre pages).

Read what other folk have to say and then let us have your views (pages 2G-28).

## When Will They Learn?

The dailies bave, presumably, decided at long last that the "Edinburgh" is not a race; but, determined to he original, they talked of pillion passengers in their reports of the recent run.

## Book the Date NOW.

The next long-distance event at Rronklands is The Light Car Clubs 00 lap Relay Grand Prix. The date is Saturday, July $2 \bar{z}$ th, and entries close at ordiaary fees on June 15th-just over a fortuight abcad.

## On Three Wheels.

The charming photographic study on our front cover this week not only introduces us to a picturesque corner of Kent, but reminds us of the attraction of three-wheeled cyclecars. The vehicle depicted is, of course, a sporting model of the ever-popular Morgan.

## Lighter Light Cars.

Elektron, and all that it means in the coustruction of light cars, is dealt with in an absorbing article in this issue. Elektron is a magnesium alloy and is 40 per cent. lighter than aluminium. Other developments, in connection with carburation, are also discussed, ann, in addition, we include the first full description of the new Phemix Park Rileys. Apart from other moditications these are to have four carburettersone to each cylinder and all on the same side of the block.

## R-

Parking at Wells.
Wie bear that the is. charged for parking in the market place at Wells. Somerset-n charge which aroused much discussion-has now been reduced to an " outional" Gd.


Luigi Arcangeli, the Italian racing driver who was killed while practising for last Sunday's Italian Grand Prix at Monza.

Arcangeli Killed.
Luigi Arcangeli-loaked unon as in the front rank of Italian (and, therefore, of the world's) racing drivers, was instanty killed on Saturdny last at Monza while practising for the Italian Grand Prix of the following day. He was driving the new :it-litre 32-eylinder Alfa-INomeo, which is capable of 160 in .l.h., and evidently while taking one of the dangerous bends of the winding course-which is only banked very slightly on the curves-the car overturned.


## MODERN POWER.

One of the three Rolls-Royce aero engines which will be used in this year's Schneider Trophyrace. This photo wastaken at the Derby factory where these supercharged units are undergoing extensive tests.

## S.M.M. and T. Officials.

Mr. E. M. C. lnstonc. J.I'. F.C.I.S. has been elected president of the societs of Motor Manufacturens and Trader: Stil., in succession to Mr. F. F. Blaker; for the year 1031-19:3'? Sir Lerbert Austin and Mr. J. A. Thomson are the new vice-presidents, and Mr. Leslie: Walton continues as hon. treasurer fon the seventh consecutive year.
The new president has been assaciated with the industry since its earls days, when in 1 sald be was secretnry of the Daimler concern. He has bech a member of the council of the SMAM. and T. since its incention, and a viecpresident on five occusions.
In aldition to his many mblie netivitics Mr. Instome is clinirman of the Cirele of Nineteenth Century Motorists.


## AN ATTRACTIVE AUSTIN SPECIAL

A. F. Ashby, of Hendon, was responsible for the modifcations to the Austin shown above, but the owner did the scheming. The major point of interest is the rear petrol tank, the old tank being used as a tool locker. The extras on the car include Leveroll seats, Auto-pulse fuel pump, spring steering wheel, Weathershields side screens, chromium plating of all bright parts, radiator shutters and bumpers.

## Next Week-Phcenix Park

## Thirty-eight Entries with Strong Continental Element for the Irish Grand Prix-Campbell to Drive a Riley?

T
 rhimd Irish International fing for the Which is to be held on the Ihoenix Park circuit at Dublin. As in past years, the race is contested on two separate days, up to 1,540 c.c. on the first day and over $1, \overline{5} 00$ c.c. on the next day.
In the final list of entries there are Ss cars down to start: Ten M.G. Midmets, six Austins, two 1.100) c.e. Aiaseratis and fan :2l-litre Maserntis, six Rileys, 1 wo l-litre Alfa-IRomeos and one 28 litre Alia-Romeo, a Lea-Francis, two Talliots, nin Inwieta, two Mercedes and a car unspecified.
From this it will be seen that there is a wery gioned entry indend for the light arr race abll a very strong international clement in the event ins at whole-Great Britain, firmany and Italy being the nations represented.

## Mcagre Large-car Entry.

In Claseses D. © and A (over 1) litres) thew is a somewhat dismppointing anhough these make np in muality what they helk in numbers
The Britivh ranks in the senjer class are sery thill, and the entries are confined in two Trahots and an 1nvicta. Against these are ranged four superharged Maseratis and a superehnrged Alia-liomeo in Class I ) (three litres) and two supercharged Merectes in class $A$ (unlimited). It is doubtrul at the moment of writing whether Rudolf Carnecion-who won this race last year in brilliant fashion-will be a starter, as there is some difliculty nbout the ear he proposes to drive conforming with the regulations.

## For Standard Cars.

The race is, of course, confined to standard production cars of what is known as the sporting type : every ear which starts is available to the public and is calalogued and listed at an ardinary market price. The $1,5 \mathrm{~N})$ c.c. cars must carry ewo-seater bodies and the larger cors four-seater bodies, all conforming with regulations laid down als to size and weight. Only very few modificutions may be made to the chassis of competing cars, and these are, in genemb, confined to such alterations as could be carricd out by any competent and enthusiastic private owner. In addition, cars will race with hoods, wings and lamps, and during the event the engines must be started when necessary by the electric starter only.
The wimer of the first day's racing will receive the Saorstat Cup, and the winner of the second day the Eirennn Cup ; of these, he who completes the course in the shortest time on handicap will be dechared the winner of the Grand Prix itself-a handsome silver replien of the famous Pbonix Alonument which unce stond in the middle of the eirenit. but which was removed to an adjoining site to leave a clear course for the enrs.

The credit lap system of handicapping has again been adopted, and supercharged cars have been penalized. Tha handicapping is as follows:-

## CREDIT LAPS


 Class F i1,500 c.c.1: Undupercharged. 8 laps: supercharged, 6 lapa.
Class E 2
buncris)
 Class $\mathbf{c} 15$ litres): Unsupercharged, 4 laps;

The Phmnix Park circuit, on the outskirts of Dublin, is in the shape of an clongated I) with n long, very fnst, strainht stretch nearly two miles in length. At the end comes the right angle bend known as Mountjoy Corner, which leads round by a winding course to Gough Comer and so into the straight again. At this portion of the course there is a very slight intadient rising to the middle by the grandstands and the pits, then falling gently to Mountjoy Corner, so that cars approach this bend at a terrific speed. The lnp measures shont i miles 500 yards, and the race is 70 laps-something over 300 miles in :all.

## Small Car Duel Continued

The mnjor interest in the race from $n$ light ear point of view will centre in Class II ( 750 c.e.), where the AustinMidget ducl will be earricd one strge farther. In this class 10 JI .G. Midgets will be racing agninst six supercharged Austin sievens, and the result will be watched with the more interest as this will be an opportunity for the Austin camp to attempt to reverse the issue of the recent "Dnuble-Twelve."
It is interesting to note that C. S. Staniland-well known at Brooklands at the wheel of a very fast Bugatti and

O-driver with the Earl of March in the winning M. (i. Midget in the "DonbleTwelve "-will be driving an M.G. Mid get amnin, and in the Austin team there is Captain A. Frazer Nosh, a veteran of road and track racing, and Leon Cushman, who has made a nome for himself it the wheel of Irugattis, Crossieys and Alvises in sporting events.

In Class ( $(1,109$ c.c. cars) Henken Widengren will ngnin drive the super charged straight-eight Maserati which he handled in the "Double-Twelve," and another sirailar car bas been entered by f. S. Outlaw. These two foreign entries will be opposed by no fewer than six Rileys, one of which is to be driven by Giulio Ramponi, the Italian driver. Of outstanding interest is the Riley official team, which are of the new Grand Prix type described elsewhere in this issue. The teon leader may be Sir Malcolm Camplell-driving in a road race for the first time since hils return from Daytona. Victor Gillow, who won the 1, ond e.c. event last year in a particularly dnshing mammer, will be No. 2 of the official team. C. IR. Whiteroft will be the third driver.

## Birkin to Drive an "Alfa."

Entries in the 18 -litre class are, unfortunately, only three in number-a supercharged Lea-Francis and two superchareed Alfa-Romeos, none of which will be driven by Sir Henry Pirkin. who is to handle a $2 \frac{1}{2}$-litre straight-eight model of the same marque on the next day.

Some iden of the tremendously fast nature of this course will be wathered from the fact that last vear Rudolf Caracciola (Mercedes) won at an aver age speed of S5.SS m.p.h., and Victor Gillow (Riley), who finished second in the gencral classitication and won the lithitre cvent. averaged $72.2 \mathrm{~m} . \mathrm{p} . \mathrm{h}$. The 1.500 c.c. Alfa-Fomeo which George Eyston drove into second place in the Junior race averaged $74.53 \mathrm{~m} . \mathrm{p} . \mathrm{b}$. , and the fastest Austin was Cantain Waite's, which avernged $5 S .89$ m.p.h. Owing to the fact that the coursc has been specially treated with a skid-proof and dustless dressing, it is fully expected thent these speeds, given goorl weather, will be exceeded next Friday.


3,000 MILES AT
H. Peiser and F. Hawes in the Morris Minor with 1d. PER MILE. which they recently journeyed from Capetown to Bulawayo and back in 91 days.

## Still Lighter Light CARS

## Developments of Outstanding Interest and Significance in Connection with the Use of Eleltron-More Power and Efficiency Foreshadowed as well

THE public is alrendy vagacly familiar with the name Elektron and of its efiece in weight saving. in $n$ few years it will lave become as signifieant as the mame "aluminiun"now a by-word, hut in its cally days sumething that merely excited curiosity.

Elektron is actunlly for pent. lighter than aluminium, it can be easily worked, has been thoroughly tested, and has already emabled the weight of a two-senter sperts car to he reduced by seweral ewt. The significance of this when applied to the construction rif touring cars need hardly be stressed; it is self-evident, and the more universal adoption of Eiektron may be the answer to our ery for light cars which are lighter, yee which still boast the same comfort and roominess.
Wo are told on grod anthority that magnesium was first isolated by the English chemist Sir llumphry Dary in 1sos. thus the first step towards thes prodaction of lilektron magnesium alloys as we know them today was due to an Englishman. Little commereial


Proving the strength of the alloy. The bar is only $\begin{aligned} & \text { an. in. square in section }\end{aligned}$ and easily carries the weight of a man, as shown.
importance was attached to the discovery until the electrolytic process was developed in Germany about 1900 . In 190: the Grieshein Elektrou Co. produced their first alloy and actually exhivited it in 1909 . l'rogress, however. was still slow, and production was not developer until 1914. Naturally, the war acted as a marked stimulant, and the new alloy was used as a substitute for aluminium, brass, and so on in large quantitics.

We need hardly dwell bere on the commercial processes which are used 48

THE FIRE RISK.
Although Elektron is a magnesium alloy the danger from fire except when the alloy exists in finely powdered form - is almost infinitesimal. The photo shows a sheet of Elektron merely fusing after being held for several minutes in an intensely hot blowlamp flame.

to-day for the production of magnesium alloys. nor need we inguire deeply into comparative figures. Sullice it to say that the alloy with which we are concorned, namely, Elektron, is ulequately strong enough for use in motorcar consiruction, and although it costs about 50 per cent. more that aluminium, it is, owing to the weinht ratio, of about tla? same price when it comes to sulbstituting it for nluminium.

Aluminium has the disndrantage that during machining operations the cutting sped must be carefully governed; with Jlektron, however. the cutting speed can be vers high; therefore the cost of working it compared with aluminium is much lower-another point in favour of this revolutionary metal.
It was due to the enterprise of a London concern, F. A. Hughes and Co., Ltd., of Great Portland Street, that Elektron became available in this comitry ; but even then its potentialities were grasped by few, and we are mrohably correct in saying that Mr. A. $\mathbf{F}^{\prime}$. Ashby, of IIendon, was one of the first to apply it in a practical way to smallcar construction.

## Saving $3 \frac{1}{2}$ cwt.

The successful results of his efforts are clearly evident in the four-cylinder Riley which ran in the "Jouble"Twelve." The weight of this machine before Elektron was introduced was rourhly about 17 cwt. ; on May Sth it turned the scale at about $13 \frac{1}{2}$ ewt. The new alloy displaces not only aluminium, but phosphor bronze and other metals as wetl. In Mr. Ashby's racer Flestron is employed for the wings, body, petrol tank, oil rescreve tank, filler caps, brackets, cross members, pistons, sump and gearbox. The most convincins testintuny to the lightness of the alloy is to pick up a casting, the weight
of which in, say, eastirnn is more or less knowd-and antivibatud; the combamative lightmess of ble easting is almost uncanay when elektron is employed.

## A Mythical Risk.

It has been sumanestod that Flektron is inflammable and than, Wherefore, tho fire risk would be inmensel if it we:n used for ordinary saloon bosty construction. The risk, lowever, is purely mythical, as was browed liy a tost to which Mr. Ashloy suhjected a sheet of Elektron in our presence.
The edge of the sheet was held in the fiame of a Bunsen burmer for between four and five minutes. The flame had no effect whatever on the metal. and it was not until compresserl air was uscel to boost up the fiame that the edges of the shect became inciandescent, niolted and dropped away. 'The strength of tho metal was woved by endeavouring to bend a 5 -in. spume ball--a test which is shown graphically in an illustration on this page.

Alhough pure magnesiurn and marnesium alloys are commonly understood to be susceptible in corrosion. Elektron does not share this disudvantage. In the newly worked condition Elektron his a brilliant silver colour and it is ensily polisherd, but unless it is protected it aradually becomes covered with an oxide film, grey in colour. Paradoxicallyenough, this film atcts as a protective coating and tends to prevent further corrosion. Seawater, maturally, has a corrosive effect, and the alloy is no recommended as a contaner for water. Petrol, lubricating oils and so on in contact with the bare metal show no reaction provided thoy are aciulfice.
To sum up Flektron and to demonstrate its possibilities, we guote figures aiven in a special handbook written by

## 园

Mr. H. Gondwin entitied "Magnesium Alloys, With Special Reference to Dilektron Matal." The fimeres relate to a large chassis where light alloys are employed finly extmsively, and they go to sliow that the use of Elektron whenver possible reduces the weirht we chassis by aproximately $2 \boldsymbol{5} 7 \mathrm{lb}$., i.e., equal to about two passenters.
bution and is, therefore, conducive to the highest efficieney.

As a contrast, Riley (Coventry), Ltd. are experimenting with the four carburetters all on one side of the engine, and it is possible that this arrongement will figure on the Brooklands model Riley of the near future. Mr. Ashby's four-carluretter job will make its debut

-- AND
MORE POWER.

A"straight-through view" is obtained by bolting an independent carburetter to each cylinder of an engine. This represents great theoretical and practical advantages.

Thu racing car to which we have reterred is a signitieant illustration of lan weipht cam be saved on a light car Chassis, and one which, incidentally, dues but show off the saving to the best mivantase because of the seanty bodywork.

Although $F^{*}$. A. Murhes and Co., Lttl, remain the concessionaires for the raw material in this country, it is of great interest to learn that by arrangement with them James Booth and Co., of Sirmingham, are now able to produce it ; Elektron thus becomes a branch, and an important branch, of British industry.

## Another Development.

We may now turn to another very interesting development, namely, the employment of a separate carbaretter for wery eyliniler of on enginc. This may ampar to be far removed from the possihilities of Elektron. Aetunlly, it has a distinct bearing on the point at issue, namely, the incrensed efficiency of light cars. First of nll, we have the undoubted saving of weight given by the new alloy, nud then we have a big inrrease in efliciency as represented by the application of new prineiples of carburation, or, at any rate, of a fresh adaptation of those principles.
Here we may digress for a moment to say that the actual h.h.p. developed hy Mr. Ashby's racing liley is 72 nt con 0 r.p.m. It is anticipated that with the fitting of four carburetters this b.h.p. will be inereased to such a material extent that varions parts of the engine, such as the crankshaft, will have to be strengthened
The P.R. head of the Riley engine has been ingeniously eonverted by Mr. Asbby to take two carburetters on each side. This means that two of the induction ports on one side of the engine are now utilized for exhaust and that two of the exhaust ports on the other side are employed for induction; it is clnimed that this ensures very even heat distri-
in The Lirht Car Clubs Relay Cirand Pris, and one hopes to see the fuurearburetter oficial Riley in the C'Ister 1.'下.

The precise adrantage gained by emploging a separate carburetter for each eylinder may not at first sight be obrious. The issuc is, of course, hombl up with gas distribution-one of the most important factors of all-and we need do no more than point out that where the earburetter is bolted direct to an induction pore which feeds the cylinder close to it and no other cylinder.
then problems of induction with which designers are now faced nutomatically vanish. This principle is, of course, employed to the utmost advantage on single-cylinder motoreycle engines.

## Ultra Efficiency.

With the exhaust pipe removed, the two valves held open and the buttertly throttle of the carburctier also wide open, it is possible in the case of the Riley engine to see daylight right through the block. The flow of the gases is, therefore, uni-directional. The inlet gases come stratight in at one side without obstruction of nny kind and eject themselves on the other side, simibarly without any obstruction.

Where two earburetters are put on one wide and two on the other, separate exhaust systems are, of course, necessary, but these do not tend to detract from the efliciency of the unit; they lead merely 10 a slighe extra but almost negligible complication.
The progress of the experiments which are now going forward and to which we have alluded all too bripfly, will be watchad with close interest. In the meantime we may point out that owners of some 10.31 cals are quite thaware of the lact that already Elektron figures in the supecifications of the rehicles they own.

In conclusion ic will not be out of place to refer here to the increasing attention which is being given to the possibilities of steam cooling. The principle is not new. but investigation has been carried on by only a few enthusiastic pioneers. Mr. Mantell is dealing ndequately in this journal with the whole subject, so we may content ourselves by saying that apart from increased efficiency, steam cooling agnin acts as a lightening agent because : neglipible quautity of water has to be carried.


In A. F. Ashby's Riley engine the carburetters are fitted two on one side and two on the other. Tis, of course, necessitates employing two exhaust ports for inlet purposes and vice versa. There are, naturally, two exhaust systems.

## 

## New Rileys For Irish Grand Prix

## First Details of Four-cylinder Four-carburetter Racers which will be Seen in Phoenix Park

CINCE the notable victory of the NRiley car, piloted by Victor Gillow: in Ircland last yoar, the designing staff of the liiley Co. has not by any, means been content to rest on its laurels. Apart from the inclusion of the "Plus" features in the new Brooklands racing


A quick-opening radiator cap. When pressed down the lever on top of the cap expands the inner face, thus ensuring a firm grip and a watertight joint.
models, many otber interesting items have been incorporated as well. The new cars are considerably lighter than their prototypes. and the layout of various parts of the chassis has received carcful artention to detail, with the result that in many ways the de sign has been cleaned up. Additional power. too, has been ohtained from the eugine so that altogether these new

Riley racers should be eapable of putting ul thorourhly creditable performances.

We recently had an opportunity of inspecting the four snecial racers which are being prepared for the Dublin event next week. and it is obvious that the Riley entry will offer a serious challenge to all comers, for in appearance they nre thoroughly workmanlike, nud they wive one the impression that they have: "lastins" qualities.

Cutting Down Weight.
In broad outline there is very little difference between last year's racing cars and the wew ones, but in the latest design all unnecessary weight has been removed, at the same time maintaining adeguate strength in the varions components which have becn machined down at non-vulnerable places. Again, the rather large and rather weiphty undershielt which was used on last yenr's enrs has been replaced by an nluminiom shect tray, which is bolted directly to the mulerside of the frame. In other details, too, such as hody supports and so forth, scientitic design has emabled a lot of weight to be saved, with the result that the acceleration nowers of the engine should now be more effecture.
Probably the most interesting feature in regard to the power unit lies in the induction system. Four carbureters are used (one to each cylinder), the instruments being attached to a plate which covers the four inlet norts on the off side of the cylinder hend. I'reliminary tests have shown that this system has given an increase in power, and, coupled with the lowered weight of the complete car, has generally improved the all-round performance.

As mizhe be expertod, great care has been taken with the furl and oiling arranzements. a large futton tank being installed in the fenr furing of the boly


The front of the Riley Brooklands model chassis has been cleaned up, and now presents a thoroughly workmanlike appearance. Note the latest type friction shock absorber with Telecontrol adjustment.
and a sebtarate mil tamk in the dash, si that the lubriennt an the sumb can loo replenished from timu (1) time while the ent is aetually monder was. The usual form of wessute sumplaterived from a hond pump, is enmlused for feedjug the fuel up from the rear tank, whilst a boest and blend drib-Fmed ar rangement is installod on the dashboard so that the methante: ean crerate the plonger at intervals whon replenishment of the sump is decmed neeessary.
(Right) A special additional oil tank is fitted to the Riley racers. It has a drip feed to the engine so that the mechanic can replenish the sump during a race. The hand pump is for supplying pressure to the rear fuel tank.

(Left) How the Amal carburetters are coupled up to the induction side of the cylinder head. Only two float chambers are employed, i.e., one at each end, but the throttle slides are worked from a common shaft. The performance of the Rileys will be watched with deep interest, for the adoption of one carburetter per cylinder is an innovation of very recent date and for the first time, receives the prominence which we think it deserves.

A1 Run with an Object
Whipsnade--The New Zoo


A big holiday crowd invaded Whipsnade - the new Zoo near Dunstable-on Bank Holiday. Visitors coming by road are well catered for by a large car park outside the grounds-general views of which are given above. The top left picture shows the charming tea house and restaurant.

#  <br>  

## The Trend of Design Abroad Two Interesting French Models

## The New r,ir8 c.c. La Licorne on Conventional Lines and the Huascar Two-stroke-a Runabout for $£_{0} 70$ <br> A ETFIOEGII not often seen in rating) La Licorne has achieved very arent popularity across the Channel since its first nplearance some four-andn -half years ago. This sturdy little car is designed essentially as $n$ two-senter or to carry at a maximum three massengers. <br> In France, howerer, perhaps even <br> 

more than in other countries, people have st tendency to overload small cars. With this in view Messrs. Licorne have produced a new model with a bigger engine capacity and a longer wheelbase. at a very slightly increasnd price. This car rates at 6-S h.p. in France, and as the four-cyliuder engine has a bore and stroke of 1 is mm . and 80 mm ., it would rate at 11.1 h.l. in England.

## New Casting Process.

A fenture of the engine is the cylinder bock, which is cast in one with the crankeasi. Thanks to a new foundry process which gives a much harder consistency to the metal forming the interior cylinder walls than to the remainker of the casting, it is claimed that the pistons can be fitted with less clearance than usual.
The hardening of the cylinder walls in the process of casting incolves the use of special boring machines, but this slight increase in manufacturing costs is said to be more than outweighed by the advantages gained in redueing cylinder wear, and in a reduction of oil consumption due to close-fitting pistons.
The engine has inclined side-by-side valres and a detachable heat, the complete interior of the combustion cham-


Full provision for adjustment and easy dismantling are made in the strongly built rear axde.
bers being machined and polished. This is an unusual refinement in a small car at a popular price, but one which should certainly make for efliciency. The B12

POPULAR IN $\qquad$ The 6-8 h.p. (French rating) La Licorne in saloon form. The FRANCE. ur-cylinder side-valve engine has a capacity of 1.128
There is an attractive range of standard bodywork.
pistons are of aluminium with a castiron skirt.
Of unusunlly robust construction, the camshaft runs in an oil bath, and the oil from this bath is employed in lubricating the eylinder walls, as the con-mecting-rod bir-cud bearings are, to all intents and purposes, oil-tight. The


The fan drive is taken from a pulley mounted between the dynamotor and the crankshaft nose.
camshaft is driven by silent Celeran helical pinions.

The missive, two-bearing crankshaft is machined from the solid, and a ParisRhone dynamo starter is counled to the nose of the crankshaft.

The chassis in general follows almost exactly the lines of the successful small La Licorne, engine and three-speed gearbox being of unit construction. Transmission is by open propeller shaft with large diameter Jiardy joint at the forward end, to a normal banjo-type axle. Straight pinions are employed in the differential and the axle is a particularly robust job.

The rematinder of the chassis follows standard lrench light car practice. Suspension is by nearly flat half-elliptics in front and splayed quarter-elliptics at
the rear. Giravity feed is employnd, the petrol tank being located in the soutala: incidentally, the bessed-steel sontale frame carrying the tank and instrumment board is a light and stiff pieere of work.
The batteries are aceenssible, being dropmed into the nearside front wise, and a useful standard titting is the lighting control on the stering column. The dimming of hadights heing compulsory by law in France, jt is a practical abrangement to have the lever of the dimner switch immediately under the driver's hand. As in the case of the lat Licorne " 5, " a most attractive range of standard hodywork is mate for the new model. The manufncturers of the car are Ste Anon. La Licorne, 3 (i上, INu Armand-Sylvestre, Courberoic, Scine, France.

THE TWO-STROKE HUASCAR.

## 625 c.c. Power Unit with

Several Novel Features.

TIIE interesting little IIuasear, which atracted much attention st the last Paris Salon, is now in full worluction, and $\Omega$ second model, with a slightly more powerful engine, is to be uarketed very shortly.

The IIuascar power unit is a neat little joh of rather wnusual design. 'The: two-stroke engine is of the crossheud type, and the lower part of the eylinder is completely shut off from the erankcase, the rigid piston rod passin: through a spring-packed stulling box.

The mixture enters bencalh the piston, the under side of which functions as, a pump, transferring the gas to the combustion head. This design results in rather a high-built engine, but in so small a monit as that of the IInascar this is not of much consighence. The standard model has a twocylinder engine of 625 c.c., the bore and stroke being 73 mm . nnd 75 mm . respectively, while the now de luxe model will have at $7 \overline{\mathrm{~s}} \mathrm{~mm}$. by 70 mm . cngiue of identical design.

## 

Prossure lubrication is employed, special arranfements being made for Jubricating tho evlinder walls, and at capacious oil reservoir is mounted beneath the crankease. The crankshaft. a robust one-picee forging, is mounted nu very large ball bearings. Dynamo, starter, eluteh casing and two-speed מ̈earbox are built up into a very neat unit with the engine. The clutch is of the multiple dise type, and reverse gear is engaged by a separate lever.

Transmission is by onen propellex shaft with Hardy joints to a very light, Gleason-cut, spiral bevel rear axle which does not incorporate a differential. Front suspension is by a single transverse spring, and rear suspension by quarter ellipties splayed outwards from the chassis.
The new de luxe model is being fitted


£70 IN FRANCE. The standard two-seater 625 c.c. Huascar, which incorporates electric lighting and starting and a two-speed gearbox. The power unit is a twin-cylinder tno-stroke.
with a three-speed gearbox, but otherwise the chassis is ideutical with that of the standard type. The last-named rar, in twoseater form, with electric lighting and starting, is sold in France at a price which represents $£ 70$ in English money.

## On the Road.

Our Paris representative took one of these cars out on the road and found it. at the price, rather a praiseworthy little vehicle. Not very fast on the level, it peoved a splendid hill-climher, "bansing on" in the manner peculiar to twostrokes. Stecring was light and pleasant. and braking excellent in so far as the foot hrake was concerned, but not sG good on hand contral. The engine was remarkably quiet, aud vibration mas less noticenble than is usual in these very cheap French runabouts.

One zood fenture noted was the ability of the engine to tick over slowly without misfiring. In this matter it was practically equal to a four-stroke. The makers are Voiturettes IMascar, (i4, Rue Victor-Hugo, Courbevoie, Scine, Firance.

## A FOUR-DOOR SALOON FOR POPULAR LIGHT CHASSIS

Co far as the smaller types of car are Sconcerned there are not at present many models with a four-door saloon body: Particular interest therefore attaches to a body of this type which has been built by the Clifton Carriage Works of Xork, and which can be supplied ou such chassis as the 'Triumpla Seven or "Scorgion," Morris Minor, Wolseley IIornet, Swift Cadet and others.
This coach-luilt saloon has a Bushfitting Prechley sliding roof which provides an opening 30 ins. square. All four doors are $2 \cdot t$ ins. wide and, so far as the seating accommodation is concerned, good use uppears to have been made of the space available. Separate hucket seats are provided in front and the rear cushion mensures 17 ins. from back to front and is : measurement across the inside of the hody over the wheel-arches is 413 ins.: from the bottom of the foot wells to the
seat measures $12+\frac{1}{2}$ ins. and above the seat there is $34 \frac{1}{2}$ ins. headroom.

With the driver's seat in mid position -it is adjustahle over a range of about 10 ins.-the distance from the back of that seat to the pedals is 41 ins. and to the nearest part of the steering wheel is 17 ins.

The four doors close on to the central pillar and have sliding windows provided with an easily operated catch which lucks positivels in several positions. The rear quarter lights are fixed.

Rexine is used for the upholstery and other internal trimmings in the body which retails at $£ 55$, but, for a slight extra cost, leather can be substituted. Included in the standard specification is a fully opeuing single-pane safety-glass windscreen hinged at the top, and provided with a suction-operated wiper; the equipment also includes a driving mirror. n roller-blind for the rear window aud capacious door pockets.

(Left) Showing the neat design of the cross-head twostroke engine and (right) a sectional diagram showing its novel features. The mixture enters under the piston, which acts as a pump to transfer it to the combustion chamber.

The "Man Mag" Carborundum
Although a fine file was satisfactory chough for trimming up platinum contact breaker surfaces, the tungsten alloys now frequently used for these barts are so hard as to require treatment with some such abrasive as a carborundum stone. The Manchester Magneto Co., of 51, IIardman Street, Manchester, hats met this need by marketin: at 1s. 9d. the "Man Mag" carborundum stone, which is less than a sixteenth of an inch thick and can therefore be used without dismantling the contact breaber.


## GET TO KNOW <br> The Austin Seven



We Test the $£_{185}$ Unsupercharged Edition of a Car Made Famous by Many Classic Races

TIIOO sports models are marketed by the Austin Motor Co., the two being similar in appearance and general specification, but differing in that one is supercharged and the other is not. The supercharged model costs $£ 225$ and the unsupercharged model $£ 185$.
One of these $£ 185$ models has recently been in use for 1,100 miles in our hands and has shown itself to be a particularly fascinating little car. It might be said that it has been designed in every respect in which it differs from the touring and saloon models after the most extensive racing experience which any small car has enjoyed, and in consequence it is exceedingly robust and appears, unlike many very fast small cars of the past, to be absolutely reliable and free from any irritating faults.
The Austin Seven chassis is well known to everybody, and its outstanding characteristics are to be found in the Sports model. In many matters of detail points of difference are found, howerer. One of the most important is that the chassis is lowered several inches by the use of a specially down-swept axte and springs with a reverse camber. This gives a very low centre of gravity and exceedingly low and racy lines.

## Engine Details.

It is in the engioe modifications, however, that the principal changes from the standard design are noticed. The most important is that there is forced lubrication for the big-ends via a hollow crankshaft. The oil-feed is very cleverly carried out, not by forcing the oil in throngh the journals, which would be difficalt as the main bearings are of the roller type, but by forcing it through the front end of the crankshaft. This is achieved by fully enclosing the starting-handle doss and providing a gland at the point where the B14
starting handle shaft emerges from the casing. Into the space between the dogs the oil is forced under high pressure and enters the crankshaft through a large ancrture.

Inside the engine several other changes are noted. The camshaft is designed for high efliciency and gives rapid opening and closing with a high lift. The valve springs are duplicated, the pistons are extremely light and have very narrow rings, and the gudgeon pins are fully floating and located with spring rings, which prevent endwise movement. The special crankshaft, the connecting rods and the pistons are very carefully balanced, the ports are polished and a large Solex carburetter is used.

## Special Gear Ratios.

In place of the fabric linings which are used for the cluteli on the standard models, castiron linings are employed and the gearbox also differs from standard in that it is of the close-ratio type, giving ratios of $5.2,7.5$ and 13.5 to 1 .

Another notable change from the standard chassis specification is that the steering is considerably raked.

Nolody who admires nice workmanship and careful design in a sports car can make the acquaintance of this little Austin without being very charmed with it. The metal-paneiled body is rigid, robust and very carefully thought out. Behind the driver's seat and in the tail there is a space which is occupied by the spare wheel, carried vertically in a well with room in front of it for quite a large suitcase and room behind it in the point of the tail for a further considerable quantity of luggage. Access is gained to this space by a rigid lid secured by a strap.

The bonnet sides are bolted in place, the ton being
hinged centrally in the ordinary way and secured by a slrat. The very strong and rigid single-pane Triplex windsereen is hinged along its base so that it can be folded flat over the scuttle or inclined rearwards to athy angle. The sereen has a flat top and is arranged so that the very comvenient Cape hood can be readily eliphed to it.

The inside of the car is very cosy, and there is Nenty of legroom. l'nemmatic cushions of generous size are used, the seguat) is well padded and the floor is moperly carpeted. The dashboard has an oil gauge, Sperdometer, switchbatal and revolation counter. No clock is titted. The cut-away sides of the boty give ample elbow-room even for two heavily-clad and hulky people, the seating position is very low and all the controls we found to be particularly well arranged with the excention of the haud brake, which is rather flimsy and awkward.

The high-compression side valve engine started rery asily and quickly without the starting handle having in be used, the electric starter being well able to spin the crankshaft, although heavy "il" grade oil was used.

## Over 50 m.p.h. in Second.

A peculiarity of the engine is that in spite of its high compression it is le no means particular about its fuel, hating no tendency to pink. At 5,000 r.p.m. it gives $241 \mathrm{~h} . \mathrm{h}$. and a speed of $28.2 \mathrm{~m} . \mathrm{p} . \mathrm{h}$. in bottom. 50.5 m.p.h. in second and 72 m.n.h. in top. We found that this maximum top-gear speed could be reached only ambler very farourable conditions, the normal maximum being about dif m.p.h., and 60 m.p.h. always being within rery comfortable reach.

This little Sports Austin will, in fact, tour at bolween J5 m.p.h. and ( 50 m.p.h. indefinitely, ruming extremely sweetly, bolding the road perfectly and
averaging $36 \mathrm{~m} . \mathrm{p} . \mathrm{g}$. of petrol with a negligible oil consumption. On second gear its performance is nod. It will jump from 10 to 40 in .p.h. in 14 seconds and continues to accelerate cleanly and progressively up to well over $\bar{j} 0 \mathrm{~m} . \mathrm{p} . \mathrm{h}$. still in second " From a standing start using the gears $50 \mathrm{~m} . \mathrm{p} . \mathrm{h}$. can be reacheō in 24 seconds, a performance made iussible by the exceptional snappiness of the engine and the very rapid gear changes which cau be effected.

## On Devonshire Hills.

The combination of an extremely willing engine, n light clutch, and a silent close-ratin gearbox allows the car to hold its own on the road with almost everything that is met and makes it a great joy to drive. On all normal hills extremely fast ascents can be made in second gear, but a drop to bottom is needed for the sterner stuff one meets in Devonshire.
Freak hills, unless taken exceedingly fast, cannot be conguered on the 13.5 to 1 botton gear. We found rorlock was easily climbent, however; also the rery stiff climb from Bablacombe Beach to the top of the cliff. Beggars Roost, however, called for a lower gear, the well-known hump being safely negotiated but causing so many ress. to be lost that the car came to a standstill a short distance abore it.

For trials work, with a slightly lower bottom gear the car would, however, be almost ideal, having a splendid steering lock, good brakes, and that sturdiness and willinguess which are such important attributes.
Certainly the Sports Austin Seren is one of the most delightful little cars that we know and should gire esery satisfaction to all who revel in r.p.m. allied with absolute reliability and a performance that is very much above the average.


The very low build of the Sports Austin is brought about by down-sweeping the axle and having a reverse camber on the front spring. To provide maximum efficiency manifolds with sweeping lines are used and a very large Solex carburetter is fitted. The driving compartment is very roomy, large slack air cushions being provided to ensure comfort. The floor is carpeted and the finish throughout is to a high standard.

# Motor Mathematics Simplified (Part XVII) Problems Concerning Piston Speeds 

By Dr. A. H. STUART


#### Abstract

Concluding Article of the Series-Calculations which Show the Importance of Light Reciprocating Parts


I$T$ is not a very serious calculation to find the nverage velocity of a piston if we know the length of the stroke and the r.p.m. Thus, at maximum power, the Austin Seven engine makes 2,80日 r.p.m., and, with a stroke of 3 ins , it is easy to see that the piston travels $1,400 \mathrm{ft}$. in a minute, or 23.3 ft . per second.

This is rather less than 16 m .p.h. and does not appear to be very high. If, howerer, we reflect that the piston has to reverse its direction, that is, stop and start again 5,600 times a minute or 336,000 times an hour, the performance is seen in another light.

Two puints at unce hecome apparent: (1) With such frepuent stopping and starting, the maximum speed of

## Q

 he piston must be very much higher than the average speed, and (2) with such frefuent and violent changes of velocity the acceleration must be enormous. Remembering that force is equal to mass multiplied by acceleration, it is clear that very high forces are necessary to cause these accelera-

Fig. 1.-The basis of a method of calculating piston velocity. It is fully explained in the text.
tions in the piston, quite apart from any power which is trausmitted : hence we see the importance of employing pistons as light as possible in high-speed engines.

In finding the relocity of a piston at various points in its path it is necessary for us to bear in mind

Fig. 2.-Showing the relative positions of the piston and the crank pin when the crank angle is 30 degrees.

the rapid changes which are taking place, and a method which would be quite satisfactory under conditions of moderate acceleration would not give accurate results in this case.

The simplest accurate method with which I am familiar depends upon the following principle. If the point $P$ in Fig. 1 is rotating about the point $O$ its path will lie along the circle towards $A$, but at the moment under consideration it may be regarded as if it were moving along a straight line towards 13 - that is, a tangent to the circle at the point. Similarly, the point $Q$. allhough travelling along the circle towards $\mathcal{C}$, at B16
the moment might be regarded as having a bith along the tangent towards D.

Now, if these two points were travalling romel the point $O$ with the same r.p.m.. or with the samm " angular velocity" as mathematicians womld predw 10 saty, it is obvious that although this angular velocily would be equal, the linear velocities would bo propiriminal to the radius of the circle round whids the puint was travelling. That is, the velocity of $I^{\prime}$ would litwe the same ratio to the velocity of $Q$ ats the radius OH has to OQ . This should be quite obvious.

l'ig. 22 illustralles than relative positions of the piston and crank pin when the cramk :ngle is 30 degrees. At the mommin of the conditions shown the pisalon is mowing fowards $A$ and tho (rathe pin may

Fig. 3.-Diagram showing the crank and con. rod positions when the crank angle is batween 90 degrees and 183 degrees.
be regarded as moving along the tangont towards 13.
If we draw a line at right angles in the palth of tho piston and another at right angles to the bath of the crank pin they will meet at a point which I have marked 1. Following on the lines of our argoment, we may say that at the moment under consideration the piston is moving just as if it were travelling on a circle of which the centre is I and the radins IP. while the crank pin may be regarded as having a path along a circle with the same centre and of radius IC. I is therefore called the "instantaneons centre of rotation," and it enables us to say that the ratio of the velocity of the piston to that of the crank pin is the same as the ratio of the two lengths IP and IC
first let us find the velocity of the crank pin. This is travelling round a circle of radius 14 ins . 2,800 times a minute; velocity in feet per second is therefore given by

$$
\frac{3 \pi \times 2,800}{12 \times 60}=36.6 \mathrm{ft} . \text { per sec. }
$$

Returning to lig. 2, the angle marked $H$ will be 90 degrees, mious the obliguity of the con. rorl that is $7^{\circ} 11^{\prime}$ for $\boldsymbol{r}$ crank angle of $30^{\circ}$ ). Thus $H=82^{\circ}$ ( $199^{\prime}$. Again, the angle marked $(\mathrm{i}$, being 180 degrees, minus the angle between the con. rod and the crank web, is equal to the sum of the crank angle and the obliquity angle; that is, $30^{\circ}+7^{\circ} 11^{\prime}=37^{\circ} 11^{\prime}$.
I.et $V$ be the required velocity of the piston, then

$$
\frac{\mathrm{V}}{36.6}=\frac{\mathrm{IP}}{\mathrm{IC}}
$$

and remembering that the sides of any triangle are
proportional to the sines of the opposite angles, we see that

|  | II' | Sin ( |
| :---: | :---: | :---: |
|  | IC | $\begin{aligned} & \sin 11 \\ & \sin 37^{\circ} 11^{\prime} \end{aligned}$ |
| , |  | $\begin{aligned} & \overline{\sin , 22^{a} \cdot 49^{\prime}} \\ & (1,10+4+4 \end{aligned}$ |
|  | V | $\begin{aligned} & 0.9921 \\ & 1 . .604-4 \end{aligned}$ |
| Therefore | - |  |
|  | 6.15 | 0.9921 |
| and | V | $=20.3 \mathrm{ft}$. per |

This ealculation should be repeated for each 30 degrees of crank angle up to 180 degrees. No dilliculty


Fig. 4. - Graph plotted to show therelation between crank angle and piston velocity in feet per second.
should be exprorienced, although a little care is necessaly for angles between 90 degrees and 180 degrees. (Hne case js illustrited in fig. 3 and this should make the matter clear.

The results of a complete set of calculations made in lhis waty are given in the following table:-
rrank angle $0 \quad 30 \quad 40 \quad 90 \quad 120 \quad 1.50$ l'iston velo-
$\begin{array}{llllllll}\text { rity in ft. } \\ \text { per sec } & 22.3 & 35.7 & 36.6 & 27.6 & 1+.3 & 0\end{array}$
Thase results should be plotten with care, but Fig. 4 will give an idea of the type of graph obtained.

It will be noticed that the graph is not symmetrical dut that the gradient is steeper on the up grade, indi-
caling that the acceleration is greatest during the early part of the stroke.

To ohtain the accelcration of the piston we are driven back on our method of tahulation of differences, as shown in the following table. The time interval between successive records of velocity is, of course, the

Fig. 5.-This curve shows that a piston has both positivernd negative accelerationduring its travel.

time talien for the crank web to pass through 30 degress, and as it is making 2,800 r.p.m., the interral is 1-Jti0 sec.

| Crank angle. | Piaton velocity in fl . ner sec. | Ditference of relority in 1-56u sec. | Accelcration in It. per sec. per sec. |
| :---: | :---: | :---: | :---: |
| 0 | 0 | +22.3 | $+12,480$ |
| 30 |  | + 13.4 | + 7,504 |
| (ii) | 3.). 7 | + 0.9 | + 504 |
| 90 | 36.6 | - 9.0 | $\overline{5}, 035$ |
| 120 | 27.6 | $-13.3$ | 7.449 |
| 1.9 | 14.3 | - 14.3 | - 8,007 |
| 180 | 0 |  |  |

Note that the first threc accelerations are positire because the piston is gaining speed, antl the last three are negative because it is losing speed in readiness for coming to rest at bottom dead centre.

It should be further noted that as each acceleration instead of being the ralue at a point is the mean during an interval, the result obtained should be plotted midway between the crank angles representing the interval concerned. The graph is shown in Fig. 5.

## When Motoring

AFlRESH, sunlit morning and a clear road ahead A-i road that invites speed, pleasure. An unusually gay mood is upon us, occasioned by the remembrance that, on any ordinary day, the oflice would be our destination, our journey and mode of fravelling by no means so attractive. But then, it isn't an ordinary day, but the first of the holidays; iust one day to be devoted to motoring while the rest of the world is at work.

We have left bohind us the fown and suburbs with their incoming tide of workers, and now meet with country childran en route for lhe village school. The very sume children. who, attired in their best are trating to sunday school on the day we usually see them.

Half an hour later, a deserted rond. Places we Jnow well seem strangely unfamiliar. Towns are beginning to fill with shoppers. We miss the Sundayclad, church-going townsfolk and fail to recognize them in everyday dress. Whe miss the villagers standing at their doors io watch the week-end traftic and, most of all, we miss the crowds of country youths that usually line every road-the groups of idle, lonfing young men, the sight of whom makes you appreciate more than ever the need for Sunday games.

We speed onwards. The great open roads are ours for the using. We have what we have wanted so often-solitude; the countryside uncrowded.

Then midday, the recognized time for lunch in the cpen, or, at any rate, the ideal time, children flock

## Seems Different

from school, workmen drop their tools. We. eagerly following these examples, pull into a suitable place by the roadside, a well-known stopping place which, to-day. We have to ourselves. We enjos the contents of the picnic basket, undisturbed by any passing rush of traflic or by a view of other human beings encamped in a spot near ours.

Throughout the afternoon we continue on our way, and the road becomes slightly more alive with motorists. The towns are now crowded with shoppers, in cars and afoot. . . . We leave them behind and regain the open country.
'The run home afier tea is less solitars. We now feel more normal and, strangely enough, higher spirited than during the day. We can almost beliere that, like many other workers, we are devoting the evening to recreation.

The run, of course. was delightful, such a change from the usual traffic-swamed countryside. Yetinvoluntarily, I ask myself whether I enjoy motoring on deserted roads, whether I really prefer, sar, a gay seaside place where everyone you meet is on pleasure bent. . . . The answer comes quickly-Thank goodness we are starting for the coast in two days' time and motoring down there on a Saturday. It is something to which to look forware.

Is it the English love of company or just my own somewhat erratic nature? At any rate, my English habit of self candour forced we to own the truth.
M.M.S.

## To Edinburgh UNDER DIFFICULTIES



TWo powerful acetylene finces standing like seutinels one each side of the drive through Wrothar Park, Barnet, cast a searchlight glare in the direction of the cars parked on each sidg. $A$ man walking slowly to wards them. his face lit up by the garish light, is hailed :-
"Hello, George!
"Hello yourself-but who are you? Oh! it's you is it? . . . Yes, n bit different from the daylight rally, so to speak, and a good deal different from the early days. You don't remember the first run in 1903? thought not. . . . We started from the post office in St. Martin's le Graudabout 30 of us. Not so easy then

George Reynolds and his friend pass out of earshot und we move on towards the stnrt.

B18
"Many absentees, skipper?
Harry Harveysou, chicf marshal of this and many previous "starts" shakes his head cheerfully. "Only about sixteen out of the whole bunch," be answers. "Hi, you ..." He stride off; the chicf marshal is a busy man.
In the front rauk of a privileged knot of spectators stands Mr. E. MI. C. Instone, this sear's president of the S.M.M. and 7 ?
"Giving them the official blessing?" we ask slyly.
"Xes, and why not?" says Mr. Instone. "It does me good to see such a sporting gathering and brings back old-time thrills . . . Used to do something of the kind myself once . . . but the machines are different now
And in truth they are. Here and there as they draw up to the starting
line one by one, is an open car, but for the most part they are comfy saloons or, at any rate, they have sulug hoods and side screens. The only extra gadgets appear to be spotlights; one with an amber-tinted glass is alight and throws a queer yellow light over the cars on the other side of the way.
The starter sits with Sphinx-like immobility, only awakening to life as be turns his head to verify the number of the vehiele purring up to the line and to give the signal which sends the crew off into the night on their 409 -mile journey.
" Good luck! . . See you at Brooklands on Monday." The reply is drowued in the drone of first gear aud the music of a healthy exhaust.

The foregoing describes quite necurately the atmosphere at the start of

the Motor Cercling Clubs 24th LondonVdimburala trial, which began lase Friday mioht and finished the following croning.

It has been described as one of the hardest in the series, which must be reratded as a fair deseription, because ono nill alonc, Park Tinsh, which was included in the trial last year for the first time, failed un fuwer than 65 c:as out of an entry of 171, of which 11 were non-starters.
Jrom the point of view of competitors and spectators alike, the run was marred by very bad weather, the competitors meeting thick. wet mist ns dawn broke in Yorkshire and having to endure the same conditions with heavy rainfall for six or seven hours.
Thus the most interesting part of the trial through Wharfednle and over the

> Wet Weather, the Bad Condition of Park Rash and Boggy Moorland Roads Make the Twenty-fourth Annual London-Edinburgh Trial of the M.C.C. a Memorable Event
north Yorkshire moors proved to be particularly miserable, whereas everyone bad expected thoroughly to enjoy it.

The early stages of the run were without incident. The first of the cars got awny from Parnet shortly before 11 o'clock and the Girat North Itoad was followed at a $24-\mathrm{m} . \mathrm{p} . \mathrm{h}$. average to Wetberbs, where it was left for ITarrowate and breakfast. One hundred and ninety miles liad then been covered. Lenving ITarrogate on the Pateley Bridge road, competitors were soon at the first hill-Middle Tongue.

With the exception of seven unfortunates who failed, any competitors who feared it could have suared themselves the worry. The hill proved one of the casiest that has been included in any M.C.C. event in recent years and justified its inclusion only on account

The photograph on the left gives a fine impression of the scenes on Park Rash. G. H. Strong (Standard) is seen passing F. W. J. Bolton (Morria Minor Page) who is receiving the assistance of the horse
of the fact that, being the first of the observed sectious, it served as a kind of hors d'curre.

Some three-quarters of a mile in length, the observed section commenced immedintely after a watersplash, and from this point the gradient stiffens rapidly to about 1 in 5 and the rond then takes a very sharp left-band bend -almost a hairpin-and continues straight for some 200 yards to a sharp right-hand bend; after this the gradient eases of considerably and there are one or two stretches where many competitors were able to use secoud gear.

## On Middle Tongue.

The first three-wheeler was F. E. M. Kingdon's suner sports Morgan, which made an effortless climb. It was followed by four other Morgans of varions types, all of which emulated the example of their leader.

Also in the threc-whecler class were two B.S.A.s and F. C. Kirk's CoventryVictor, and none of them secmed to find the hill in the least dificult. All the three-wheeler drivers, incidentally. handled their machines in a vers sober manner, there being a complete absence of fireworks.

The cars, for the most part, toured up the bill with monotonous consistency and few of the drivers showed the least inclination to attempt to gnin credit for the fastest ascent. Indeed, so sober were the drivers and so cass was the hill that it would be almost unfair to single out any for specinl mention.

The only distinction. in fact, that enn be drawu is between those who kept on motoring and those who did not! Heve is $n$ list of the latter, so far as the light-car contingent is concerned:E. J. Erith (Wolseley Hornet), G. M.

Symonds (Morris Minor), J. A. E. Marsh (Wolseley Fornet), G. J. Prevost (Anstin Seven), J. Torrome (Austin Twelve Six) and M. U. Morris-Goodall (Aston-Martin).

These failures, it is worth noting were due entirely either to bad luck or lad handling and cast no reffection on the cars concerned, for the hill was so easy that even the most under-nowered moderu car should have experienced no trouble.

A very rough road was followed for two miles from the top of the hill and thence onward through Eebden to Grassington and Kettlewell.

From here a moorland track led towards the distant fell over which could be seen the winding sear which is Park Rash-the Yorkshire terrorand in the stendy drizzle which was f,glling like a dank veil over the hills and the valley, a terror it proved to be.

## Park Rash.

Park Rash is steed. Its average gradient is about 1 in 3 . Add to this a vicious left-hand hairpin followed by nother right-handed, place deep gullies across the road-one below the hairpin, one on it, and one just after it-import any good shingle beach aud call that the surface, admix two or threc inches of loose earth-and there you have Park Rash as the competitors found it at nine o clock in the morning, soaked by the steady rain.
It was evident, as "Focus" said last week, that there were going to be a great many failures among the cars, although on the whole the solo motorcyclists found no great difficalty. The sidecars made a very poor showing-it remained to see what the three-wheelers and cars would do.
The three-wheelers lised un to their reputation. There were only two failures out of the eight entries-both f.w.d. B.S.A.s. Of the others it was difficult to say which was the most spectacular, swift and stone-scattering: possibly the palm should go to $T$. H. Jones ( 1,096 c.c. Morgan). F. C. Kirk (Coventry-Victor) toured up in unhurried fashion, but all the Morgans swept up at speed.

## The Car Performances.

The first car to arrive set a bad example by failing low down the billS. H. Rae (Riley Six), and sti did the next, H. J. Stroud (Riley Nine). As car after car made its nttempt it was obvious that as a class the light cars were showing the big stuff a thing or two. aud that as a marque, the Wolseley Hornets were far and away the outstanding performers. Tip they went, silent, fast, absolutely steady and surc. Saloons, snorts four-seaters, all treated the hill alike-and went on to look for the next.

Of all the climbs of the day E.J. Firith (Wolseley Hornet) was probably the best, but the other Fornet drivers ran him close.

Of the many Rilegs some were good
and some were not, nind it was sonn obrious that, as usun, incomberence and inesuericnce were taking their toll. W. J. Milton (Austin saloon) showed the applauding crowd that an Austin can treat the Rash with contempt, and G. A. Thomas (M.G Mident), with a neat and well-judgel uscent. shored that, properly handled, nu M.C. Midget can do the same, with power in hand.
The three 'Trojans, of course, behnved as Trojaus always do on these ocen sions. No one could sny they were ton fast, but they ambled contentedly ull the hill one after the other-G. L. Gaskell, WV. G. Jatherley, and, in a new type saloon, (. A. Mnsting.

When they had got well away. F. I M. Warris swirled up in the Interceptor Frazer-Nash and left an impression of flying stomes, ofruity engine nnd a very high mear. II. WV. Inderwick"s Frazer Nash also laughed the hill aside. It amused the crowd greatly to see some What second-hand Frazer-Nashos sween past stately Talbots. Vauxhalls an! similar dignified failures

## Tried to Climb in Neutral.

J. Torrome (Austin Twolve-Six) came to rest well down the hill. did things to restart, aud announced that something odd had hapmened to his eluteh. after which it was discovered that the gear lover reposed in nentral: A slow and steady climh was put up be F. M. Mill (Triumph Scorpion). but J. WVallis (Triumph) came suddenly to rest as if he had run out of fuel. J!. A. Roy (Triumuh) also fniled.
iv. N. Fuster (W゙olseley IInruet) was an excellent exponent of the Hornet school of motoring flashing ull past strauded eats and loose bonlders alike. and Major I). E. M. Mumglas-Morris (WVolselev IInrmet snloni) thought it was a ralls, nod, spick and span, toured up smiling. J. A. F. Narsh made another gnod Hornet climb in a staud ard sports two-scater
L. C. Madsen (Morris Minor) found nothing to bother him. and then two gnod climbs were made hy M. W. IS. May (Aston-Martin), who succeeded whem M. H. Morris Goodall (AstonMartin) failed, aud J. D. Nelson
(Riley), whon plunged about the road, but climbed well.
Fir fou many enrs needed the ministations of Walter the Jorse nad the merry men provided with larke tow ropes. Out of the eight there-wherlers there were only two failures, sum of he 10 s light enrs entered :ha failed.
Once out of the ohserved section, the enmpetiturs expected that the remaninder of the climb to the top of the range uf fills where I'ark liash is situatod wonk be un easy business. They were due for a disapmointment, howerer. A mile or o beyond the observed section the grass grown track herame very stoel and slippery and was soon entirely blocked by cars with their whenels spituning idy on the slippery surface

## Confusion on the Moors

For n while there was ennsideralile disorder until two or three trawolling marshals came on the seene, took charinu of the proceedings and orgnnized a pushbeparty to rescue the ears whicht bere blocking the was.
Many competitors were delayed for arer an hour and got rhoroughly soation by the alturmate heary rain and drizale

The loug delny made all sase the eniliest numbers iery late at the noxt hill. Askriga which was g\% miles bo yond Park Rash. Itare no car in gund tume and properly handed should have experienced ony difliculty, for there is not much gradient and the surface although treacherous, provided guite a sood hrip.

Of the flree-wherelets. H. Laime (Morkan) whs the limst arrival, and omped ull leaving a shower of stomes 11 his walie. Ci. H. Gioorhall, T. II. Jobses and H. J. Henper, also in Mur. gans, followed his example.
IV. li. (onwhot (B.S.A.), with a patir of competition tyrm on the fromt whels, climbed with certainy amb undly a trace of whoolspin. II. E. M Kimedna took lis Mmagan up at a bory reditable speed and $\mathrm{F}^{\text {. ic. Kirk (Coven }}$ ry-Viotols) apmonded the water-splash who nu parsplitting bang in the "x hamst and made a stend! climh

Tha one failum was 7". Li. Tiaban (I.S.A.). who arrived wors lith athl "x
 observed sentio.


(Left) On West Stones-
dale. E. C. Brown (Lea-
Francis) storming the
famous hairpin. (Abone)
W. R. Nimmo (Frazer-

Nash) follows the example of many other competitors and hits the bank on the same hill. (Centre) A glimpse of the sharp Lend at the foot of Middle Tongue. The car is W. E. Greenleaf's Riley Nine.
f. A. Thomas, in an M.g. Midget, hinns ity off-side: rear wing, took the folash fast and made an outstanding (limb) Fe W. J. Bulton (Morris Minor) mined the splash. sembling up a huge chud wi spray. But failed just round the hend
There wia actually more fun at the thy of the hill than at the water-splash "re the bend. for the straight just hefore the emb of the usorred seetimin included
strutch where the sarface was un"xpectally slipury, and here some sur frisina ewhutions were nerformed.
EK wat: fur Askrigk the competitors had frmad lithe time to admire the beautiful Wharmate semery ore even to
tutice rhe Mrearth Fralls, amd it was the stime hegunt it. The road through

(Top, right) Typical of the conditions on Park Rash. A. F. Jackson (Austin Swallow), is seen being pushed past C. H. Mann (Lagonda) who requires the help of a horse. (Right) An idea of the sharpness of the West Stonesdale hairpin can be gathered from this photograph which shows the deviation in the course of the road. The car is G. E. Gaskell's Trojan. (In circle) Edinburgh at last. C. J. Linzell (M.G. Special) arrivirs at the final check.

Gummerside. Thwaite and Kield to West Stomosiale withessed a sustained "blim!" to recover seledule time. This was succescially accomplished by the throw-whers and most of the early numbers.

When the eight three-wheeler compotifors arrived at West Stonesdale and madu the almost fandiless climbes which is their custom, the weather was not two had, bur the improrement did not Jast longe.

Haby rain was falling again when the car eontingent attacked the hill. Guly a mere hamiful of spectatorsmostly hardy dalesmen-braved the elements, so that the rather wild driving. inents, which several drivers. san fit to indulge can harily have been due to stage fright" or to a desire to "play to the gallery.

In many cases, however, it lost for them all chance of a gold medal.

Properly executed, n fast climb with fust the right amount of skid on the two hairing was, wirh some ears,
obviously the right way to take the hill. F. I' I'atrick (Austin Seven) and F. L. M. Marris (Frazer-Nash) proved this conclusively.

In spite of a broken spring $U$ bult, II. W. Inderwick (Frazer-Nash) made a very good climb wihh his passenger crammed amongst slare's and lugnage in the dieley sont, to ruinwe fis far as insaible, the stratin on the b:oken purts.

Clean elimbs wore made by C. I. Lambert amd d. Turromb drisug Austin Twelve-Nixus. by the Ratess, and, excelt for one whilh hit the bink, by the Wolseley Horners : indeed, there should be no difliculty in drision any good car un Wrist Stonesdale.

With this hill behind them the combetitors had only to cover en yards in seven seconds from a standing start on 'Tan Hill and to complete the 1 To o miles to Didinlurgh to be sure of retaining whatever awords their earlier performances liad secured for them. It least
one man, however, lost a gold medal on the Tan llill restart.
On a fine day it is a glorious run from the top of 'ran Ifill orer the moors to the main Carlisle road. In the rain and mist of last Saturday. however, it was hard to enjoy anything of the scenery which was discernible, and, in any cuse, everyone was in far too great a hurry to take the ir eges off the road! Only the drivers of tine very fastest cars arrived on time in C'frlisle, aud many. in conseruence, had to curtuil their lutheh in or. or to ger aw: atarain to time.

From Corlisie unwards to Edinburgh there was a maked improvement in the weather and the glorious Lomlands scenery was thoroughly enjoyed. Ten was taken at the midde distance on the banks of St. Mary's Larli-surely one of Scotlands most charming sines-nod guod roads were then followed via Innerluithen and-Lskbank to Edinburgh. Only 14 competitors fililed to cheek in.


## The Wettest Ever.

WHITSUN, from the weather point of view, was an absolute llop in its early stages, but made up for saturday's and Sunday's debacle on Mondas: which was surely the first day of summer. My wanderings took me to Edinburgh on Saturday with the M.C.C. and back from Edinburgh to town on Sunday.

Most of Saturday up north we were driving through heary mist and rain, whilst torrents of rain accompanied me from Edinburgh as far south as Boroughbridge on the Sunday. It was the wettest and least pleasant Edinburgh run from the weather point of view that I can remember.

## A Brooklands Come-back.

HOW different were the conditions at Brooklands on Munday. One would have been very comfortable in tropical kit. The sun shone brilliantly all day and the whole atmosphere was that of midsummer. Brouklands, by the way, seems to be making a big come-back in public esteem. The crowd was estimated at approximately 50,000 , every car park was full and every enclosure was a mass of humanity.

I suppose the reason why Brooklands is regaining its popularity is largely on account of the exciting " round the mountain" races. The first public appearance in England of Captain Malcolm Campbell's "Blue Bird" in action was also no doubt a great draw on Monday. The very large crowds were treated to good racing and it was one of the most interesting meetings I have attended.

## Scrap Sidelamps.

ONE often wonders why almost every light car has sidelamps which are separate from the headlamps. They are something extra to clean, they complicate the wiring to some extent, and, so far as I can see, there is no need for them.

## B22

Wharfedale gems on the London-Edinburgh course. - A corner of Kettlewell, showing the Race Horses Hotel, and a typical old stone bridge on the moors.

All that the lighting regularions rerguire is that the lights showing forward after dark should be so placed that "no part of the vehicle or its erguip. ment extend laterally on the same side as the lamp more than twelve inches beyond the centre of the: lamp." The reguirements of the law thus make it perfectly in order for sidelamps to be abolished and the headlamps to be mounted close to the wings and provided with small "sidelamp" bobbs. As one who is an ardent believer in serapping all umnecessary fittings and eliminating every possible source of unreliability the headlamp-cum-sidelamp idea is one which appeats to me immensely.

## Oxford Street's Robots.

PROBABLX the traflic authorities in most of the busy cities in the country will be keenly interested in the working of the synchromized "stop-caution-go" signs which are being instatled in Oxford Street, London. One of the busiest thoroughfares in the world and one of the most complicated on account of the very large number of side turnings, it will provide a fine testing ground for the system.

The plan, 1 understand, is to have the sigmals at the various crossings all "rimed" so that when traflic at one end of the section gets the "go": signal, the section will be clear of crossing trallic for its whole length. One imagines complications being caused by drivers who wish to turn to the right half-way along the section and one

On normal cars the whole oneration takes about ten minutes and costs 3 s . For this outlay the owner has every normal lubrication point except the engine sump, gearbox and rear axle attended (1), including even the duor locks. hinges and the bonnet clips. For another 1s. fd. the mechanics go over the same ground and, in addition, tighten the nuts of the body bolts, wing iron bolts, and so forth. The maximum ined service charge is 19s. Gd.., for which one gets about as much work done as it would take a couple of days to accomplish at home.

## Money in Car Care.

TTHFRE seems to be little doubt that this American servicing notion is due to make sulbstantial progress, and I hear, in fact, that already the firms which supply the necessary apparatus are doing good business. An example of the profitcarning capacity of up-to-date servicing machinery was provided a few days ago when I had the brakes of a car adjusted at a very well equipped North London garage. The job took ten minutes and the charge was 2 s. I was very well satisfied with the prompt attention I receired, with the resulting job and with the bill. The proprietor of the establishment, ton, could hare listle to grumble about. I do not expect the mechanic's wages were more than 2s. an hour, so that the transaction showed a very useful gross profit.

Car care on up-to-date lines should be a paying business, and one wishes every success to the increasing number of concerns which are vigorously striving for this class of business.

## Can't-be-had Lubricants.

ONE effect of service stations specializing in oiling and greasing customers' cars for a set charge will be to make peculiar lubrication systems calling for highly-specialized lubricants very unpopular. I imagine people will be reluctant to buy cars the maker of which is emphatic that certain very special grades and brands of lubricants are needed, and the result will be that in time evers car will use for its engine, gearbox, axle and chassis parts the same types of oil as every other car. Such a derelopment would be a blessing from the user's point of view and a great help to garages and service stations.

There is nothing more worrsing than to find in an instruction book that some important part of a car must be lubricated with So-and-So's Extraspecial, Super-fine, De Luxe, graphited hyperlubricant or something of the kind. When one wants the stuff and there is none at hand one has no idea what to use as a substitute. The ideal handbook would give at least six other suitable named lubricants for each part and would describe their nature as well.

## A Good Bonnet.

AFEW weeks ago when writing about bomets I mentioned what awkward, clumsy things they are nowadays, and what a blessing it would be if those of us who had to lift our bonnets every time we replenished the tank could be spared this muisance. Recently I made the acquaintance of a honnet which is free from all the usual faults. It cannot knock a dent in the lamp or scratch the
scuttle; it is light, well built and, I should say; cheaper than the ordinary variets. It is a standard fitting on the Austin Seven sports model, and l give herewith a sketch showing how it works.
The sides are fised in place by two bolts ench,


A bonne! which "Focus" fav-ours-only the top part lifts.
end only the top lifts, a central hinge allowing each side to be lifted independently of the other. This type of bonnet gives extremely convenient access to the petrol tank. the oil filler, the dipstick, the distributor, the carburetter and the plugs, so the need for removing the sides arises only when one has to adjust the tappets or to carry out some fairly extensive job.

## Catches on the Shoulder-line.

GURELE this type of bonmet is well worth consideration by everyone who makes cars. It seems to me to have everything in its favour, and
no drawbacks sare the need for having catches on the shoulder-line where they would be visible instead of on the bonnet board where they aro hidden by the wing valance. It is hard to believe, however, that there is not somehody in the world with suflicient ingenuity to devise a bonnet catch which would not look imsightly on the shoulderline and which would not unduly complicate cleaning or create any other snags.

In the case of the Austin Seven on which I met this bonnet it is hedd down by a strap, which is, of course, very approbriate and useful for a sports model hut which would be entirely ont of place on a touring car.

## The Hornet Club.

I was very interesting to reald in the Forrespondence columns last week that : Wholseley Hornet cluts is being formed. I surgensed some time ago that the rapidly growind hath of keen Hornet owners was even then sulliciently momerons to form the nuclens of a first-class one-makre (lah) and there is now no doubt at all that such a cluh might well enjoy a very large fommere mombership and rapidy increasing pobularity

I hope that the folk behind the propused club will push the idea forward as emerontioally as possible, and I sincerely trust that their efloots will meet with the greatest succuss


Scenes in the London-Edinburgh Trial last Saturday. E. H. Denton (M.G. Midget) successfully negotiating the hairpin which caused many failures on West Stonesdale. W. F. Gowlett (B.S.A.) on the corner of Parl Rash. F. N. Foster (Wolseley Hornet) crossing the watersplash at Middle Tongue. Doleful Dobbin, a trifle short of b.h.p. (note the slack traces), giving H. W. Burman's Lea-Francis a tow up Park Rash.

## REASONS FOR DUNLOP SUPREMACY

NUMBER TWO


## Test Tubes and Tyres

A view of one secrion of the
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Start now to save the life of your engine-use Mobiloil COSTS SO LITTLE-SAVES SO MUCH VACUUM OIL COMPANY, LIMITED


## Holiday Motoring.

LIST Momblay. Bank Huliclay, there was, no (loubt, the largest volume of private car tradic on the romals sincer last year. The Ehorions sumshine which concrecl such a large part of 1hw eountry secmed to bring "ut every whecled rehicle Which could possibly be put into commission-and there were singularly few accihonts and less discourtesy and had driving than hat bern the anse on any previous occasion since the days when we all used to go holiday-making by dail. Along our main roads the traflic flowed shonthly, culting-in was rarely seen and many an :mbitions journey was successfully completed and boned thoroughly enjoyable from start to finish. There is modoubt that all who use the roads have atderl considerably to their store of road sense since bast vear and that the standard of driving in this country is now as high, if not higher, than in any other.

The Whitsun holiday, too, was a great success in the realms of motoring sport. Although they had had weather, competitors in the LondonEdinturgh run reported that it was extremely ofjoyable, whist the big meeting at Brooklands was one of the most successful erer held.

We may look hack in sorrow and in anger upon Saturday's and Sunday's deluges, but the holiday as a whole will rank in many motorists' minds as one of the most pleasurable they can remember. Leet us hone that there will be many days this summer as fine and warm and joyous as last Monday.

## The New Metal.

WYrJH each Olympia exhibition that comes rouncl, with every race that is run, with every experiment that is tried, there comes a feeling of finality, of deadlock. "Surely," say the wiseacres, "we have at last reached a point where design can go no farther, where every possible avenue of adrancement has been exhausted, where we must say 'Here, at last, is the motorear in as perfect a form as it is erer likely to be.'" And then the rumour of some fresh and epoch-marking development becomes current. At first it is only an idea; it is followed by experiments upon which the sceptics cast a doubtful eye, and finally it emerges trimmphant-as often as not on a racing

## Topics of the Day


or super sports vehicle-to become a standard fitting in an incredibly short space of time.

It was thus with lowpressure tyres, front-wheel brakes, superchargers, gearboxes with "silent thirds," detachable cylinder heads, thoroughly reliable valves and so on. To-day we are on the eve of developments of an equally significant nature and in this issue we dea! with what is probably the furthest advanced and most imminent - namely, the application of the lightweight magnesium alloy Eiektron to motorcar construction. This alone may well mark the begimning of a new epoch in car construction; it may, in fact, be the answer to our blea for lighter light cars.

## Steam Cooling Progress.

ON another page in this issue Mr. L. Mantell continues his discussion upon the advantages of steam cooling, and readers who are interested in the technical side of motoring should make a point of reading the articles in question. It is claimed that neither water-cooling nor air-cooling represent the ideal means for keeping down the temperature of an engine, and it is interesting to remember that although steam-cooling as an alternative has been known for many years, no very serious attempts have heen made to bring this s.stem into universal use.

As Mr. Mantell points ont, the main advantage of steam-cooling is that the rumning temperature of the engine can be maintained at a point which is more conducive to the attainment of high thermal efficiencies than is the case with watercooling. It must not be forgotten, moreover, that the radiator is a rather volnerable component, but it must be placed in an exposed position on the car in order to allow the maximum quantity of air to impinge upon it for cooling purposes. It seems probable, however, that in a perfected stemmcooling system the radiator or, as it would then become, the condenser, could be mounted in a position where it would not be liable to damage through collision.

This, combined with a reduction in weight owing to the need for carrying less water, should make steam-cooling a subject for careful consideration by desiguers.


## IDEAS

T'HE choice of a sparking plug or 5s. is offered for every reader's hint published in this feature. No hint should exceed 200 words in length; if necessary a rough sketch should accompany it and the sender must indicate whether, in the event of publication. he prefers 5s. or a sparking plug.


## Unscrewing Hub Caps.

ON some cars having ordinary serew-on hub caps, these are thin brass stampings and are fairly easily damaged. The proper tool to use when removing or screwing on a cap of this type is a closed hexagon spanner or, if this tool is
 not a vailable, an adjustable spanner with really true jaws may be used. In general, however, it will be found better to make up a special gripping tool on the lines of that illustrated in the accompanying sketch The wooden handle shoud be about 18 ins. long and the loop may be of leather or canvas: it is secured to the handle by means of $\frac{-3}{16}-\mathrm{in}$. bolts. The loop wust not be a close fit on the huh cap-there should be enough slack in it to allow the end of the handle to "dig in" with a kind of servo action.

## Fitting Cork Gaskets.

IT$T$ is a good plan when fitting a new cork gasket to the valve cover or similar part to coat one:face of the gasket with gold size and to stick it to the cover. This will keep the gasket properly in place and ensure that it is not damaged when the cover is removed. The other face of the gasket must not be coated with any form of adhesive but a light film of oil or grease is sométimes au adrantage.

## Useful Plug Tester.

THE value of being able to check accurately the bridging capacity of the spark at the jufg terminal was mentioned recently by Mr. Mantell. A useful testing gauge can easily be made at home and will give better results than the
 rather haphazard screwdriver test. The gauge consists of a strip of ebonite about 6 ins. long, 1 in . wide and $\ddagger \mathrm{in}$. thick; a wireless terminal, or a small brass block, provided with a horizontal screw, is fitted near one end of the strip and secured to the terminal is a length of flexible wire or a piece of light brass "picture chain." The method of using the tester is to hold the terminal end of the strip against the plug insulator and, with the wire, or chain, "earthed," to adjust the gap by means of the screw until the spark jumps. Having checked one plug, the testor cau be moved to the others and as, with the end of the ebonite acting as a limit stop against the insulator, the gap at any plug must be of constant size-provided the plugs are all of the same make and type-an accurate guide to sparking efficiency can be obtained.

## Austin Seven Greasing

OWNERS of early morlel Austin Serens should remember that lubrication points are powided at the end of the torque tube and at the universall joint. Greasegun attention should be given to these points about every 300 miles. It is advisable to mjert a fait amount of lubricant, the torgur-tube cond in farlicular being capable of hotding a mordoracely lasge patantity With a small grease-gun the job) is rather lengthy

A hint worth noting is that at gun ot the ohf type with a wooden plunger can be used for quickly filling the universal joint and torque-tube end. Tha nipples can be removed and the nozale of the gun simply pushed into the orifices, care Joing taken afterwards to replace the nipples.

## Jowett Foot Rest.

TTHE generous amount of leg room providerd in most Jowett models is apt to make it diflicult for a short driver to rest his left foot in comfort when it is not on the clutch pedal. It is very easy, howeror, to make a
 comfortable font rest by screwing to the floorboard ramp, alongside the cluteh pedal, a piece of wood about $8 \frac{1}{2}$ ins. long, $2 \frac{1}{2}$ ins. wide and 31 ins. thick; it is screwed to the board narrow side on. The exact position should first be found by trial and, for the sake of appearance, the face of the block should be covered with a piece of pyramid rubber matting, or similar material. The depth of the block should be such that the foot slides off it easily on to the pedal.

## Auxiliary Petrol Filter.

WI'TH the normal type of petrol tap screwed, as a rule, into a small sump in the base of the tank there is the risk that loose pieces of solder, detached from the tank joints, may settle over the bove of the tap and impede the fucl flow. A
 simple remedy for this trouble is to enlarge the upper end of the tap bore and to solder into it a short length of copper tuhe in which a number of small holes are drilled. A disc of copper or brass is soldered over the open end of the tube. In this manner a very effective auxiliary filter is formed; it will not arrest jet-stopping particles, but a free flow of fuel will always be assured. If desired, the idea may be mod:fied by cutting two vertical slots in the tube, instead of drilling it, and covering them with a piece of wire gauze carefully soldered to the tube.

# A 

## SWALLOW

 LOOKS EXPENSIVEIt makes the owner feel important, yet Swallow Coachwork costs little more, if any, than ordinary Coachwork. You must have noticed how people stop and look in rapt admiration when a Swallow passes on the road. But until you have seen the latest Swallow models, you'll never know just how beautifully comfortable, and truly admirable, these exclusive bodies are.

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"The Light Car and Cyclecar" when writing to adveriisers. They will appreciale it.

## Another new hornet



## The two-seater coupé-a fascinating addition to the famous Wolseley "HORNET" range . . .

This smart attractive Coupé, the latest of the "Hornets," has jumped into instant popularity. Graceful in line and finely proportioned, it appeals strongly to the discerning motorist as an ideal double-purpose car. Its stylish modernity fits it admirably for use in town : whilst the sunshine roof and capacious luggage boot make it equally suitable for long-distance touring.
It is easy of access on either side, has plenty of head-room, and the leather-trimmed bucket seats are adjustable. Lockheed Hydraulic brakes, Triplex glass, 12 -volt lighting and starting and automatic radiator shutters are all included in its very full specification.

## The HORNET

Six-cylinder
TWO SEATER COUPÉ £215
Other Models from $£ 175$

## THE W O L S E L.E Y HORNET"\%

Furl details of the above, or of any Wolseley model, from the authorised distributors.

## TECHNICAL ASPECTS

# Theory and Practice OF Steam Cooling 

By L. MANTELL

# What is actually Required of the Ideal System-A <br> Brief Description of a Successful American Layout <br> Working on Novel Lines 

LSNT week J startur to deseribe the durimeinlan of steam cooling, but the loupthy monmbly involved in first attombting to analyse the therman short"سming s of cxisting systems and the Hecosily for arriving at some more sultahlo unilhud exhansted all the available sbitio $I$ will therefore contimes.

Nlthontry fromat alterations have been m:mele in 1 whinn design since the earliest motorears mado their sppenrance, tho fuadabmontals uf coolins have remained mothanmeil for ower eb) verars, and while flacxaal ableulations have all given the imunn:sum wht the whole guestion of Hoat abstraction, wr, as the case minht Ir. conservation. necraded a complete overhand it is only willin the past few yoans that the real facts hove began to - 'ryciallize out amb the suspicion become a eertaniay that menn temperature ransens and balmuces wore not all that could be desired.

Ordinary steam-cooling has been tlicd, fut hot suceessfully, nud, although the introduction of high boiling-point duges into the cooling water has shown promise, it is mot very practical if applied in nn onen system, becanse stestm-nucketiner can oceur here nlso and one is also limited rirently in one's choice of cooling anents.

Iby means of succial methorls, however, and the employment of high boilingfoint liguids, torether withmeans for Heventing steam bockets, a series of experiments has recently been made to try to ascertain aumroximately the besi freneral temprrature.

The expmriments would at present npurear to show that it lies somewhere in the neighbourhood of $3(10)$ degrees Falne., and at this mean hent it is stated that in the test eugine an improvement of about $\bar{j}$ per cent. was noted in the נn.e.p. and over 20 wer cent. in the themal efliciency (that is, in efrect, miles per frallon) ns compured to the normal figures respectively. It is also stated that the lumning was much smoother and that there was n marked freedom from carbonization and detonation when drivon muder a combjnation of speed, lond and ignition sdrance that ardinarily would have induced this comlition.

The absence of detonntion and the more perfect lubrication with a 50 per cent. better engine mny strike many ns
being in the mature of a physical contradiction: I would impress. however, that it all hinges on the portentous difference between mean, or general hent, and local heat.
The normal engine, with its "hit-ormiss " methods of cooling, is certainly at a lower peneral temperature, but very much better locally-especially round the exhaust valves-than the other, and it is this local heat, which can be very high indeed, that does the damage.

Various steam-cooling investigations have been going on in England for some time. but I understand that they are, on the whole. unsuccessful, mainly on account of the dificulty of control. Where is, however, a method in operition in America called the Foutz system, of which 1 read execllent reports, and its description may serve to indicate the general lines unon which one has to go in developing modified cooling methods.
First let me explain to the nontechnical that although water boils at 212 degrees this figure assumes atmospheric pressure, which, in effect, means boiling more or less in the open. If the stam produced is confinel, and thus allowed to exert a pressure on the sarface of the water, the boiling point begins to ascend proportionately with the pressure.

Guen a sufficiently strong containing ressel it would, in fact, be possible to have water red hot and still not boiling: it is all a question of the pressure on the surface. Again. water ordinarily contains air in solution which greatly lowers its boiling point: when the air is axpelled the boiling moint becomes very much higher-over 50 degrees-and the Foutz system takes adrantage of this in the following way:-

To besin with, the whole arrangement is sealed in hecause it operates under pressure. The jacketins system, with its intuke and oftake, is substantially normal, but the radiator and pipe wark are specinl.
The former has an upher and lower water compartment, the top part communicnting with the botton by two side water " leass." as they are called, and in the centre, cut off from the cireulatinn, is a stean condenser, the whole being spuroximately the size of an ordinary radiator.

The condenser communicates with the space above the unper tauk, where water vapour gradually forms as the temperature rises, and having reached a predetermined pressure opens a springloaded valve and esenjes to the condenser, down which it passes, and the resultant water, as it collects at the bottom, is drawn by pump shetion via a special nozzle into the circulating stream again, thas cooling it.
The action is, nerhaps, a little diffi cult to grasp readily, but I will endeavour to convey it. When the engine is first started up the water contains a considerable amount of air in solution, and therefore it boils easily, ur, rather would boil but for the fact that the rising pressure on the surface of the top tank jrevents it from doing so, and as the system is sealed in this pressure is communiented to every part, and therefore prevents the formation or steam pockets the local pressure of which antomatically stops the formation of rapour.
The immediate action of the increased pressure on the upper surface of the top tank is to force a more rapid circulntion of water, with, of course, improved couling. and as the dissolved air is eradunlly expelled from the water its boiling point proportionately rises.

The temperature of the whole system thus becomes eradualls higher, up to the maximum governed by the blowingoff point at which the valve spring to the condenser is set. The greater the working heat to be dissipated the more vapour is released to the condenser ; eminequently, the greater is the infux of cool water into the moving stream at the bottom and the higher simultaneous vapour pressure at the top produces, at the same time, a mote rapid circulation, but always in a completely liquid form, for any local attempt at boiling will. of course, antomatically defear itself by increasing the pressure on the surface with a couseguent incrense of the boiling point and suppression of the boiling.

A pressure of 5 lb . or 6 lb . per sq. in. is stated to raise the maximum general temperature by about 50 degrees Fahr. after air expulsion. and, of course, higher pressures will gire a pro ratil inerease.


BIROOKLANDS at its hayest. Loms before 11 a.m. on Munday anst $n$ white-cuated attendant sam. Its exunin to be a big day: yuu can ulways tedl." And he was right.
The smooth wreen sloges of the hill beckoned invitingly under a hot white sun, the admission was cheap-ming half-a-crewn-sud the programane held promise of being good.

A steady stream of humanity poured into the grounds; for the most part they left their cars in the parks wear the gates anfl urdoded in happily on fuot. ISy 1 pm . the car parks were full and the vehicies had to be lined up on the roads themselves; by 1.30 11.m. every hrogramme had been sold; the hill presented a variogated enrpet of colour-solid with bright frocks, and purasuls to make a vivid splash leere and there-and every point of vantage was taken up. Athletic youngesters ever. swarmed "11, the skeleton of the big electrie score board.
"Fold you so:" satd the attendant lacouicall:-

Chaplin's Austin, driven by E. C. II liandall, won the first race-a ${ }^{\text {a moun- }}$ 1ain" event; Hebeler (M.G. Midget) was only 2 secs. behind, and 2 seces. behind him was Virmon Jalls's Austin. Goud for you, Mr. Fhblowhite-real rourl hamdicappinge Incidents: I's, rwo. (inrdiner (M.G.) overshot the: mark at the fork and went straight on : Fotheringham Parker went one better by crashing into the barriers and sendn3:

# Brooklands 

One of the Best Meetings Ever-Earl Howe's Fine Victory in "Gold Star" Race-Blue Bird's Triamphant Parade -"Aldy" Wins Another "Mountain" Race
ing splintered pieces of wood hiph into the air: then he slewed his car rouns and, unaware of the fact that he whs arctually pushing a large piece of the broken frnmework in front of him, commenced to acelerate down the straight. Officials wildy gesticulated the male blue fag was waved framtically to warn owertaking cars. a dash was made for the piece of framework-non anot to one side-nnd the race went on.

Then the " Innior Short." Victney fell to a bir cal-Mceson"s Vauxhahbut Iburcher's Riles was very close bohind, and Ford's 1.496 c.e. Bugatti was a good third. Burtlett's אalmson limped hors de combat into the padidock half-way through. "Trouble with the water-coolilig system," it was satid.
"Len" Cundman drowe the sim; Austin Soven in fine fastinn, hat the pace of the leathers was mush too grent.
" Boby" derceed that Mrason must be put baek from 1 min, of ieres. in 47 secs. for thw mext race-the - Saraion Short"-but Meesna did mot eare. Me wor just the same will Solly (two
 birkin (Bentley) thind. Farl How (Drlage, bite of Sir M. Campbell's stable) was a non-starter. "Saving it for the "Cold sitar.' snid his Inrelship, and his kodshij knew what be was talking abour, to
The ". Junior Leong " fell to an Invicta Try ats he wonld, Horsman in his old ear, Trimmoh il (yes, he has a sew one, 'Triumph 1, wider, lower' and


 "Ith: me lbonlley wa- third. The pree
 were the litile - vistin and the did. Finctal (lwith mistrinaz). "Ormondes Austin, :mbl Hawkre Vanxhall with What samated di-thells like bigemed tanuble

Tralkine rif mew care. C. A. Villiers:s Austin wa: dewn to be driven by kiay Inwnil Mask in the next item on the
 -butt the sar way sematedhed. During paction ir refased to "hbw "at more tham 111 I. it is 16 1b., so the blower was bousted up-and a gasket went. Subsegnently vilicers discovered that the: throthe was sticking. "And who on rarth would hate thomsht of lonking there for the ratuse of the bother." he sad houlumis. Anyway, Fargularsion (Sillmsent-n newemer-won by
 ewnin) : and Irian bawis (Thellotl. drivins: atre, clam race, was thited.
Fawtuharan drove without vither gresties or "mash hat-the real holiday shirit: and Salmsons swom to like the "Mommain" course. Sir M. Campell delishterd the crown in his 1 -litre "Bne". but could da no better than fourtio
Vernom batls kept the light car far
flym: in the One-lan Surint loy run ning honne third in his Austin (the
 !aj.(0) m.p.h.), and then came the 20 mile " (ind Stax

Lou could act 25 to $]$ on Fiarl Howe, sud why on earth you hadist thonght about it you didn"t know. Ife just streaked through the fied ahead, amb evert ('obl) (Delage), who was second, coulenit overtakn him. It was arood to se Intry's 'Thomas special third. Varl Itowe won at 120.S m.p.h., but his hest lap was at 126.11 m.p.h. By way of contrast, Cobb put un 1:32.so m.p.h. and Sir 11. Birkin (Rentley) 12S.fis) m.p.h. an their fastest lans. Cohb hat a real slice of bad lack for, butting in an extral lan by mistake, he wrecker his engime.

Next. Sir M. Camphell was cheored lustily as he drove the ". lilae Sird round the track. Majestic but not fast enough for some of the crowd, who faterd to realize bhat the car was desisned for the billinrds table smoothness of the samls at llaytona.
Put back from the $23-$ second to the 6-secomd mark. Earl Howe again de lighted his sumporters in the " Senmor Long ": but what a Homeric battle! For the last quarter of a mile his Dolage ran bonmet to bonnet with Panl's Smbeam, and crept forward only an
meh at a time-or so it seemed to the agonized bunters who bat their money on him. Olficially the bulane won by $\because$ yards ; goud for you amain. " Ebby. Whew! 119.47 m.p.h. from 1.154 c.c.
Finally, the second "Mountain Suced" and a fine "come back" for II. J. - ldiaston (Frazer-N:ash), who swelr quibely round the course oblivious of the shricks of Sir \$. C'umpbell's superchurged Mareedes and seven other: all with " blowers." 'Ihe l'rnzer-Nash worr by fik) sards: then came Gilbert drivim: IBalls* 'Talbor and the " Merc." Abart from a threatencal mix un between the Mercedes, Esplens Talbet and Coubers Latanda at the fork, the race west oft like clockwork. Sir Malcolm covered one: lap at 73.56 m.p.h. and averaged T(0.t m.p.h. "Aldy" in bis unsupercharaed lrazer-Nash averaged $61.4(1 \mathrm{~m} . \mathrm{p} . \mathrm{h}$.

Somewhere about 6.30 p.m. the public enclusure was empty again; but, oh! those once briaht areen slopes: thes looked ats thonsh it had bean bailing and raiming htter-mostly paper bags. The white-coated assistant pazed at the spertacte saddy.

Nin't mone of im ont nny dustbins at hone?" " he said plaintively.

[^2]


#### Abstract

We welcome letters for publication in these columns. Nc anonymous communications will be accepled, but writers may use a nom de plume. To ensure publ'cation in the next issue, lelters should be addressed to the Editor, "The Light Car and Cyclecarit 5-15, Rosebery Avenue, London, E.C.1, and should reach us on Monday. Please write 5-15, Rosebery Auenue, London, E.C. $\begin{gathered}\text { only on one side of the paper and leave a wide margin. }\end{gathered}$


## WEIGHT MUST BE REDUCED

## Speed for Modern Roads and-

lou have my whole-hearted support in your repented pleas for lighter light ears. As things ure nt present, anyone who wants rensonable performance, coupled with low tax and moderate first cost, has nothing for it
-Acceleralion for but to buy a pukka sports car. Surely
Modern Traffic. this is all wrong. There must be thousands who, like myself, do not wish to be passed by every cheap American saloon, but who do not actunlly want an out-and-out sports car with its limited seating accommodation, noor weather protection and general discomfort.

Yet we shall have to put up with one or other of these evils until manufacturers ut lost come to their senses and realize that the light-car public has no use for cars that will not go. Modern roads demand a high cruising speed and modern traftic calls for good ucceleration. Tinfortunately the arerage "modern" light car is hopelessly out of date, as it possesses neither of these characteristies and no amount of chromium plating, finger-tip controls, dipping lamps and other pretty-pretry features will make it really suitable for modern conditions.

The only remedy is weight reduction and if makers dn not get this fact into their heads the British lipht car will soon see its popularity waning.
II. L. Huret

## Overburdening Bodies.

"Hear, hear!" to the sentiments ev!n+man! in "Topics of the Day" last week regarding the unduly bigh weight of modern "light" ears. The present tombenny to ruin the

## Aping the <br> lig Car.

 fine performate af ajlius little ene gine and well-designed chassis by placing a large cumberme body on the top of it is surely a suifietal policy on the part of mamufacturers. We do not want whicles that auc big cars, but light, compact and economial models that have a worth-while road performance.d.L. ${ }^{\prime}$.

## Cast-iron Taboo.

The suggestion that light ears should be lighter is to be beartily commended. Why, indeed, should the: fower of our engines be used largely in mulling uscless weixht? Years
ago when cast-iron and bronze were in

## Elekiron

Cylinder Jlueks. regular use the whinht of a car was uccessarily high, but now that alnminium is firmly established, ingether with duralumin, and Eifektron is being so suecessifully used I really do think that manufacturess should use these metals wherever possible. Why not Elektron eylinder blocks with nitralloy liners?
J. Denjamis.

## More "Practical"

Having read with interest your correspondents' hints upon how to back out of a garage and through the gate without corrying it (the gate) away with them, might I offer the following information upon

## Sonse Amusing Notions.

 certain problems that every motorist muxb face at some time or another?$H$ How to get to a petrol station without loss of dignity.-When stranded with a dry tank and a drier mouth a mile or so from the nearest pettol station, the best plan is to place one's weakest passenger at the wheel and then to knoek a hole through the rear floorboards, so that onc can "walk" the car along whilst giving the appearance of riding as a passenger.

The polite way of rof using a stranger a lift when you don't quite like the looks of him.-Pull up politely, listen attentively to the request for a lift and then burst into tears. Between your sobs you must then explain that you live but 200 sards up the road, and were it not for the fact that it was your bath night jou would be simply delighted to drive anyone anywhere. Then offer the stranger a cigarette and drive quickly awar.

IIow to ride in cumfort when the wife drives.-Procure $n$ B34

## Hints for Drivers

book so interesting that yon can hardly tear your eyes away from each page as you furn over the leaves. Then sit on the flonr in the back of the car with a large rug completely covering you and with an electric torch to enable you to see to read, and pretoni that you're perfectly safe in a submarine on its way to the North l'ole under the ice. You must, of course. plig the cars with cotton wool so that you won't hear the nolicemen swenting.
How to place a car on an evien keel when one tyre is fat.Let all the air out of the other iluree.
How to get out of a bad trafic jam.-Get out and go home ly tube and then collect your car from the police station the next morning. If somnone steals it then collect the insurance money instead ond buy a new cur.
How to start an engine thet won't/-lirst press the starter button until your battery runs out: then crank the bus until you can crank no longer; then bush the car to the top of a long, stepp hill and start coasting down in gear. If she still refuses to start when you are threc-quarters of the way down the hill, run straight into a brick wall or decp ditch and put yourself out of your misery.

Artifur Groon.



Listen to the merry hum of Singers speeding past! Therejs a lively engine! How to keep it smooth and sweet year after year? How else but with Price's Motorine - recommended by Singer for the last six years? Motokine - refined from the pick of the world's raw oils. Motorine - used by Rolls-Rioyce for over twenty years. Price's Motorine - costing no more than other oils. Use the grade blended to suit your car.

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## OUR REGADERS' OPINIONS (contd.)

## Steam Cooling Years Ago.

1 was very glacl to see that Mr. L. Mantell has been giv2 ng some thought to the question of stam cooling. His ideas and suggestions are nlways so practical that one has the utmost confillence in any remark he

Why sor Litlle
Progress: stention: it is not new iden little attention ; it is not a mew iden. as I remember that the monoplane used by the late Wubert 1athan in the wery enily days of flying was fitted with a stemu-conled Antoinette engine. To-day the I:A.F. is expromenthe with stean cooling, and l here soon to hers that mutnear manufacturers are following suit.
M. Bermon.

## Sparing the Birds.

Whilst I have mo doubt that your correspondent "Sl thin" is guitu serious in his phea for our bird friemas." I mast saly that I have never rad a more perfect example of sentimental nonsense thun? Wulat wean. Lut me say at the outset hat I, also, am sommowh of $n$ Nature lover and would mower medhesty haran either bird or beast. At the same time 1 homblal like to ask "S1-4nis" if he comsidered exactly What the efteet wond be if everyone responded to his pleat
Ho munt sucely realize-if he knows so much about the hathits if bimb-that the only way to make absolutely sure of avcidng the possibility of killing then is not to exceed a speed of 2 2. m.p.h.
This buing so, cuery ear driver, mo matter whether enpaked on buciness of not, would find himself crawling along oul main roads at this funcrenl pace; every long-distance mutor ceath driver would find himself daing the same and turning out his irale bassengers some homrs late at their restination: frery engine driver would have to disregard his time-tible and nuset the whole working of the railway; and, finally, flying would censo altogether, becanse nero-
planes cannot fly at a speed that will definitely onsure us:ainst " nvian casualtien."
Surely "SY4053," you dn not anggeat that the cutire husiness of the country should be upset in this way merely to respect "our wild birds' rights"?
R. Jensen.


A reader's snap, taken whilst crossing the GravesendTilbury Ferry with a Jowett (see letter below).

Crossing the Ferry.
T enclose a photograph taken when crossing the Tilbury Ferry with my Jowett. The journey is most interesting. for the Thames is always a delight with its constantly changing panorama of shinping. In the

Interesting
Thames sights. photograph a big cargo boat can be seen. whilst during the journey we also saw quite a fleet of harges and tugs. The ferry runs between Tilbury and Gravesend. and the fare for a car not exceeding $10 \mathrm{~h} . \mathrm{p}$. is 4 ts . single and 6s. return.

บ.W.

## "THE WALL OF DEATH"-More Views

## Yet Another Explanation.

W: hatw bern much interested by the correspondence rolating th the " Wall of Death," and especially by Mr. Hillarys rontribution to the diseussion. Surely so far as

The liorses at Work. friction is concerned the facts are simple enough. It is a fundomental law of mechanics that the sum of the externat forces on a body must bu zero. Since gravity is the omly extorual force acting on the motoreyele or car in at vertical direction, when circling the " Wall of leath." thore must be an equal and ouposite force also acting vertically. The only mint where this force can be applied is at the point of contact hetween the wall and the tyres, and the only vertical reaction that can be ohtaned from the vertical wall is that due in friction. No mmount of misamplicd ingennity cain esenne these facts.

Wien Nr. Ifillary's "upmard drive" is produced by the vertieal component of the friction existing between the back wheel (or whels) and the wall.

In addition to the sums of the forces (both vertical and horizontal) being zero, it is necessary also to preserve equilibrium that the sum of the moments of these fores should bu zero. The moment due to the weight of the machine, acting at a definite distance from the wall. mast be balaneed by an equal and opposite moment. Without wimg into this matter ton deenly it can be said that this halaneing moment is moduced by the sum of n series of smaller moments, due, for example, to gyro aetion, the " nffset" centrifugal foree due to the upwned inclination $\mathrm{o}_{2}^{2}$ the back wheel (or wheels), and in the ense of the motorcecle the pussible upward "bank" given to the machine by the rider.

In general. the altitude of the machine to the wall is ndjusted until the foress broduced bring about this condition of equilibrium, and the attitude will vary with the speed of the machine. all other things being eoual. This attitude will be such that the front wheds will run truly in line with the general direction of the machine, whilst the rear wheels will run "crabwise."

Mr. Hillary is surely wrong again in his remarbs concerning the effects of centrifugal farce on a body. The effect of this force is to increase the apmarent weight of the body. and this camot be better illastrated than by reference to the physical effects produced on the pilets of the Schneider Trophy seaplanes when these are engaged on fairly shary tirns.

In the ease of the carburetter of our car or motorcycle, centrifugal fore will camse the petrol in the float chamber and the flont to become " heavier." The density of the petrol will remain appreciably maffected. therefore the:
heavier" Hoat will cause the petrol to rise higher in the flont chamber, and incidentally higher in the jet, thus tending to cause a rieher mixture. But, to bahance this, the constant volume of air can take up ouly a diminisbed guantity of the "heavier" petrol. In practice, according to Mr. Mantell, these two conflicting pheuomena just about cancel out.
A. E. Ellison and I. J. Rees.

The Wail of Death.
Why all this confusing rhetoric about the Wall of Death? It sounds more like the Wail of Death. Has none of your correspondents ever nttached a rope to a bucket full of
water and, beginting by swinging it Views. zently round, gradually increased the ejped until the cord is in the same plane as the ground, the bucket being horizontal? It can tie done without spilling a single drop of water. The only ageney at work that matters is centrifugal force, and that. to my mind, is the only agency that matter: in considering the Wal! of Death. The bucket of water experiment, moreover, clearly explains why earburation is only slightly affected; I say slighty because obviously centrifugal force is acting on the fuel in the pias from tank to carburetter and, also, in the jet itself. It would appear, ton, that a kind of "blower" effect is introduced on the induction stroke, but this is probably counterbalanced by gas laf owin: to centrifugal foree on the exhaust stroke. Finally. how does the same foree nffect engine balance? Stedent.

## OVR READERS OPINIONS (contd.)

## Rear Tanks for Small Cars.

One sometimes hears the contention that the rear of the chassis is not the right place for a petrol tamk. 1n my opinion it is the obvious place, first, because it enobles the

## The safely ispect.

 weight of severnl gallons of petrol tobe carried low down and well back, ensuring greater stability, and, secomdly, becatise it is as far removed from the enrburetter, with its possibilities of fire as possible.

I think the Ninger Co. are to be congratulated on being The first people to produce $n$ really complete small cur with n rear tauk, and $I$ am certain that their foresight in adoptfing this safety policy as regards the fucl tank will show itself in increased popularity of this ear. L. A. Clark.

## Safety on the Roads.

1 rend with interest your article, "Abusing the Code." which appeared last week in .. Topies of the Dny." It is true that motorists in gencral are behaving splendidly, but
it is my opinion that quite 50 per cent

## Educations

 Nirrded.hink. therefore, that if they know, they do not carc. I to be educated in traftic matters. This might be done largely by the use of posters prominently dispinged.

I have been driving a London bus for the mast 18 years: I am also n cer owner, aud-touch wood-have not yet bad any aecident involving personal injury, but there have been many oreasions when my nerves have suffered owing to the carelessness of pedestrians.

Be FAir.

## The Flowing Bowl.

The Minister of Transport is being urged to issue, through local authorities. inn alcohol warning card to each applienat for a driver's licence. In some countries this is

## Drink and <br> Safety J-irst.

 already done. It is coming to be regarded as anti-social behnriour for a motorist to consume alcohol whilst in charge of, or for some hours prior to faking charge of, n motor vehicle. A liguor trade jourmal becently pointed ont that "Drink does not ro if you have 10 degend on your dexterity with a car," whilst Sir Arbuthnot Lune has said: " Iny nleohol should be consumed only when the ear has been replaced in the garage."It would thas seem that drinking by a motorist whilst on the road. or shortly prior to driving. is quite incompatible with Safety First.

Wentern Temperance League.

## Tyre Pressures in Trials.

In his reply which appeared benenth my letter in your issue of May 22nd, "The Writer of the Article" on "How -Golds are Won" seems to have ignored several importunt

## Mr. Nelson's <br> Mr. Nelson's Suggestion.

 are tyre section and axle ations are tyre section and axle loads. Obvionsly, what wonld apply on a car weighing 10 cwt. would not do on another vehicle weighing a ton, given similar section tyres. Trials should " improve the breed," and to go about vear after year on under-infloted tyres in order to climb greasy hills is the wrong policy. It is about as sombd as slipping a clutch because one's gear ratio is too high. If tyres are not capable of holding at correct inflation pressures, I am certnin that the tyre companies would be only too pleased to sit down and think seriously.Given a suitable section tyre, it should hold on any surface if correctly inflated, but, in my estimation, most cars have tyres of too small a section. Of course, some cars, for no very apparent reason, are subject to wheelspin with any tyres, at any pressures, whilst other cars can be driven un the same hill without wherlspin almost irrespertive of tyre conditious.

I can assure "The Writer of the Article" that I do know something of tractive resistance. I should define it simply as the foree that tends to keep the trre back when the wheel "wants to go on." With under-inflation both wheel and tyre are more or less free to have their own way. The tractive resistance is raised and the tyre tends to stop behind, whist at the same time resistance letween rim and twe is decreased and the rim continues forward. IResulf, either volve out or tyre in two pieces.

B38

IIaving no great nbility to discuss the really technical side of tyres, 1 would like to suggest that we mpleal to the Dunlop Co.. Litd.. for information. I make this sugrestion, as I fecl that it is of the greatest interest 10 everyone.

Meanwhile, 1 nm pinning my faith to the real competition tyre correctly, if not slightly over, inflnted.

D. Nelson.

## CONDENSED CORRESPONDENCE.

Mr. N. L. Jumn writes to say that he is glad to mote a definite netempt amongst motoreyclists to improve their rond manners in the shape of a recent "goodwill" competition in which a cup was offered to the most courteous rider.

## READERS' WANTS.

Rover.-An instruction book relatinis the the 102; $\%$ h.jp. model-H. C. Montaga, SO, Leander Luaid, Thornton llearh, Surres.

Salmson.-An instruction book dealing with the 102: 9.5 h.p. model.-Fred. K. Mall, Old Dally, Malton Mowbrny, Leicester.

## ASKED AND ANSWERED.

F.II. (Taunton).-lelectric cars are rated at $6 \mathrm{~h} . \mathrm{p}$. for the purposes of taxation, and, therefore, the aunual tax is $£(5$.
K.R. (IIalifax).-In view of the fact that you allowed vour elgine to rim short of oil we should imagine that the knock which has been notiecable ever siture is duc to a bigend bearing that has "run." The only pencedy is, of course, (t) have it remetalled.
11.A.J. ( Kingston-on-Thanmes). Whilst ware quite aware that tyre mileages of 15,000 and wen : $2(0,0$ (h) are not uncommon, we certanly do not think youl have any canse for actunl complaint because you find it necessary on your IU h.p. car to replace a rear tyre after $] 0,0(0)$ miles.
L.M. (Dover).-No. You should entainly not flush out the sump of your engine with paraflin after draining, as smull guantities are sure to be left behind, when they will, of course, contaminate the new oil. We shmuld adsise you to use Chemico flushing oil, which is produreal spereislly for this purpose ; a quart tin, which costs 1s. Bd., shomld be sufficient for your Morris Minur.
D.B. (Liverpool).-The clicking moise which you notice when your engine is stopped after a run need cause you no alarm. as it is merely produced by the various joints in the engine as the metal contracts on cooling. 'lhe different coeflicients of expansion of the various motals used result jn slight movement taking place between the patts, this, of course, setting up the noise in question.
I.V. (Crewe).-Yes, it will be quite possible for you to use your 6-volt horn on your new car, although the intter has a 12 -volt circuit. You must wire the horn direct to the bnttery. taking one of the leads to one or other of the end terminnls in the normal manner and the second lead to the bus-bat comecting the middle: two cells. In this way you will be tapping the battery in such a manner as to obtain anly 6 volts.
D.I.I. (Durhami).- $\boldsymbol{A}$ slight erack in the exhaust manifold of sn engine will not in any way affect its pulling powers or speed. We should advise you, however, to have the fanlt rectified either by welding or by fitting a new manifold, as exhaust fumes escaping at this point mny find their way into the body with harmful effects on the health of the occupants: there is also a slight risk of fire should the carburetter be on the exhaust side of the engine.
T.R. (Edinburgh).-An ammeter does not give any indication of the state of charge of a lantters, but is merely an instrument for measuring the flow of current. The centre zero type usually fitted to a car gives a grod genernl indication of the working of the electrical system. The current generated by the dynamo is recorded on the "charge" side nad that Inken by the lamps, ignition and so on is shown by the position of the needle on the "discharge" side, whilst, when the lamps are in use and the dynamo is charging, the balance of current flowing into or out of the batery is recorded. You will radily sec from this that such thoubles as dynamo failure me iustantly disceruible, whilst. the readings of the ammeter are also a raluable guide when adjusting the current output of the dynamo or when fitting lamp bulbs of a different power. Do not, however, imngine that the instrument has any direct reference to the state of the battery.


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## SPORTS

Who Wants a Garage at Dublin? The Rabassada Hill-climb-Good Entry for the French Grand Prix-Notes at Random

WHENE are all those people who abrooklandl: in it loms-distance race, but who hat te bewh dwharred from taking part mwing |" |mankeint considerations? Mr. Yule of Thu bipht Cur Club, tells med that they are nut coming forward in large numbluta :thl he nslis me to stress the fact wat the Relay girand I'rix roally phathe at mique opportunity for them to reali\%e their ambitions.
Entrims at urinary fees close in a little wer a firthights time, so hustle yo would-b. -lued merchants, and let Mr. Yille have yom colly for one of the must bownd and athative races of the suat
1 wonlur whether Morgan owners really : appremiale the fnet that this is a race in whin thes have every chance of shinint? An "xampla has been set by the Sorsam Hotor Con., Latd., whicis intwarl: t", unter an onicial team com bossed of II. C. loones, A. C. Maskell and TT. A. Whodes. The cars to ho driven by the first two named will have air-couled J.J.I.'. engines, whilst the third machine will hate a water-cooled Iblackburne.
Auother very interesting entry received is that of Mr. Hught C. Hunter llis tenm will consist of תn AstonMartin, an Alfa-homeo and a two seater sports lifley-all unsupercharged.

A
DUBLAN gentleman signing himself "Enthusinst" has written to me to suy thate he is willing "to offer any competitor in the Hish (irand Irrix races on dume 5th and 6th tho use of a garage, tugether with a large closed in yard and ath unerguipherd workshop." The sarage he says, is well situated in the eity and las ample room for 2 wo small cars.
Should any competitor wish to tntie advantage of this offer, I will be pleased to forward his letter to "Enthusiast."

OAi Sunday, May 17 th, the Rabassadu hill-climb, was run off-the Spanish event which counts towards the Hillclimb Championship of Eurone, as the Shelsley open event does in this country: The climb seems to have been an outstanding success with a crowd of 50,000 people. Caracciola, of conrse, won the sports car class with his 71litre Mercedes. and made the fastest climb of the day. In the sports car events 1 Endriquez (Amilcar) won the 1,100 c.e. class; the 1 l-litre class way won by Elevros (Bugatti), the 5 -litre
cars-one of the few first-class events which aro open to purely racing machines.
Entries have not reached phenousenal figures-as is to be expected in these days of spotts car racing-but nupear to make up in qualits what they lack in numbers. Among those don'n io run are the official Bugattistes, Chiron, Varzi, Divo and Bouriat: Robert sencehal (Delage). Willianss and Lehoux ( Bugattis ), and Iranorsky and Stofitel (Mercedes).

Grent interest has been aroused in

France by the prospect of seeing British Irivers in this event, aud it is pleasing to see their names in the list. They include Kaye Jon (Grand I'rix Sunbeam), W. I?. Scort (12 -litre straight(izht Delage), and Earl Howe (Busatti). I have not seen the final lise of entries, and as I write it is fully expeted that there will be official tums of Ilfa-Romeo and Maserati.

TTOSTS of people missed the cheery Lpresence ut Lrooklands on Mondiny of Stumy Davis. bue hosts of people, I venture to sungest. Were thinking about him and recalling his nmazingly bad luck at the Easter meeting, when, owing to the ultia treacherous state of the t.ack due to rain, Davis skidded down the home banking and crashed. As usual, wild and unfounded rumours were soon current ns to the extent of his injuries, and it was hinted that one of his legs would have to be amputated. I understand that there was never any question of this, but it must not be inferred, therefore, that bis injuties were slight. Apart from a conpound fracture there was a hole clean through the leg. which might have beea made by the gear lever, and only those who have had experience of this kind of thing know the agonies which Davis mast have endured and must still be enduring.

Yet he is still his bright and optimistic self. In a little note which I received last week he said. "Things are going better, but, as you know, it is a long jub, and lots of it anyone can have for a couple of yen, which, I understind, so 100.000 .000 to the penty:

Heres to his speedy recovery-n toast to which many of us drank in the cujs that cheers on Monday last.

$$
\rightarrow
$$

MR. M. A. McEVOS, of Derby, I -hear, is forming a Wolseloy Hornct Club ior the Midlands. He writes that the first assembly will take place on Sunday afternoon, May 31st, at the Derwent Hotel, Whatstandwell. about 1:2 miles out of Derby on the Natlock road. Any Hornet owners who care to roll aloug to the meeting will be very welcome.

I
BAVE an amondment to make to the results of the V"usey Cup Trial. given in the issue of last webt, in which the winner of the Carless Proply-l: Laker-was given as driving a Wolseley

Hornet. As a matter of fact the ear was a Wolseley Hornct Patrick Specinl -one of the attractive onen two-fourseater sports llurnets which are proving so popular for competition work.

WFLL after Park Rasl, no one can say that this year's "Edinburgh" was a sociat event nad no more. And it was not so much the Rash itself as the lipper Rash-where cars wallowed and floundered in the mud-which cansed this years event to become a lively topic of cunversation.

Strange tales were current in Kettlowell at the foot of the hill. from which it would appear that heroic 1 hings were done to extricate cars from the morass, including the efforts of $a$ far-sering inbabitaut of those parts who produced a

Fordson tractor, with which he proceched to extract machines, with much benctit to the drivers' timekeeping aud financinl advancemeut to himself.

It strikes rather a dull note, however, to hear from certain of the crews that while cars were hab-can to huh-cag in the mud there seemed a certain rebuetance to band tozether to get them out. on the score that those who, by united effiort, were get out would guin perceptibly on time-which seems to show the wrong spirit.

TIIE Italimn Grand Prix was run at Monza last Sunday. starting at S am. and continuing for ten hours. 1t must have been a terrific race for Campari and Nuvolari. in a 2 litice Alfa-Romeo, wou at $95.17 \mathrm{~m} . \mathrm{p} . \mathrm{h}$-aud
this on the rond circuit. with its dangerous so-slightly banked curves. The second men home were Minoial und lharzacehini (2t-litre Affa-liomeo), at 9.7.7: m.p.h., and third came Divo and Homriat (liugatti), at !):, J. m.p.b. Another Lusatti was fumeth.

After 10 laps at 101 m.y.in.. Varzi (Bugati) led Campari and I ehoux (]3ugatti). At 20 lapse the specel was 102 m.j.h., and the same thrye ears were still together. Varai went out at $4 \cdot \frac{1}{4}$ lis and Campari loil to the end. breaking the lap record en route at 104.sh m.p.h. In the 1 -litie class there was a very close finish herween lage geri and Balestrero (Talhol) at so m.p.h.. and Pirola and L.arani (AlfaRomeo), who were a fractiun slower.

## CLUB ITEMS AND SPORTING EVENTS

## INSURANCE OFFICERS' M.C.

The firgi club fixture-the treasure hunt in
 the Ace of Spades Garage on the Gireat Weat
 Inquiriea recardink hice club should be mado to Mr. T. Cotier, 8, Spring Terrace, Sheen Ruad,
Richmond, Surrey.

ILFORD M.C. AND L.C.C.
Thic cluh is organizing the seconu Inter-club
 bijpt.
The event is open to motorescles and cars and is deucribed an lecing of the easy variels. Springicld, near Chelmsford, and tho finish Nill be at Sprinkfield at ahout 10 a $m$ in the following dey. The 120 -male. Lisht section of the route will be vere main roads, and after With olue dye. 4 s.-cloge on June 2 nd, nnd tickets for bremkinst-5., cach-wint bo orderell at the hime of enterink meeting is Mr. O M. The hon. "ersitary of the mecting is Mr. Oex
Verrall, 32 , Counland Avenuc, Ilford, Esex.

## SOUTHERN JOWETT L.C.C

The next rally of the club will be on Sunday. May 3111 at 12.30 n.m. in Shardeloes Prari:, Amorahami Bucks. All Jowett owners in tho welrome. Full narricularn may bo obinined Wiom thi bon secretary. Mr. E. A. Dudley


June 5th will the the date of the annual allnight club run. to the Jowelt worka, ind nomp. Uers should notify the hon secretary a once
if they intend to jom the parts. The yluchell if they intend to moin the parts
Cup Triad will to deld on duly 4 th.

## WOOD GREEN AND D M.C

The club is to hold ei Eymh mana (irnerianils Park in and of the Royal Nurthen 11 asmal and
July ish. Mr ML E. Foster. the papular ha: ascretary



## the camping club

The following mutor tours heve te.n wranged




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## EISTAGE WATKINS

WHEN REPLYING to advertisements, mention "The Light Car and Cyclecar."

## AROUND THE TRADE

In view of the fact that the majority of insurance policies are invalid if the holder allows his driving licence to lapse, it is of interest to note that Associated Insurance Agencies, Lid., $\because 9$, Lime Strect, London. E.C.3, who issue Mascut policies, offer a free licence reminder sexvee to their poliey holders.
Joseph Lacos, Ltd., have now opened new slow rooms, ofliees and trade department at 319, legent Street, London, W.1. in place of their hranch in Shaftesbury Avenuc. London. In nddition to Lucas products, C.A.V., Kotax. Lavax, Powell nud Hanmer nud M.L. products will be represented.
Readers who are interested in the motoreycle T.T. races in the Isle of Man shonld write to the Leicester lantuer Co., Lid., Evington Valley Mills, Leicester, for a coly of the 19:31 edition of their T.T. souvenir bonklet. In addition to lists of entries for this year's races, the booklet gives full details of past events, a sped table, useful advice to visifors to the Isle of Man, rail and boat time-tables, and much other interesting information.


Mr. H. C. M. Stevens, who has recently been appointed designer and production engineer of Singer and Co., Lid., of Coventry. He has played an important part in the development of internal combustion engines in Italy, America and France, as well as in thin country.

Amalamated Carhuretters, Ltd., Ifolforl Works. Perry 13arr, Birminglanm, inform us thit the Singer Super Six saloon which, subject to oflicinl confirmation, hroke class records for 48, te and !n; hours at over $60 \mathrm{~m} .1 \mathrm{~h} . \mathrm{h}$., was fitted with an Amal down-draught pump carluretter.

Fiat Nine owners who are without instruction hooks should minte that handhooks for thesio cars can still he obtaned from liat (Ehglathe Litd.. Western Avenue. Acton. London, W..3, price ?s. !d. pest free. When writing fur a handwok it is important that the chassis number of the car should be stated.

Lissen, Ltd, Lissenium Worhs: Worple linad, Twewnth, Middlesex. have just iswed two fodders deamg respectively with their sparking plugs, nud ear and motoregcle hatheriw. Both folders are informative, and inclucte recommendation charts showing the correct types or models for practically all makes of car and motoreycle.

Barimar, Ltd.. IS, Lamb's C'onduit Strect. London, W.C.I. infurm us that they are in a position to undenak: welding repairs to blektron, the new mannesimm alloy. Which is much lighter than sluminium and, at the salne time, stronger. They have sent us a sample of a haw if bakemen, which has been weldecl, and the repair ampertes bu ber batica larly well earried out, being entirely frec frem blow hales.

Dest and Lloyd. Letl., Cambray Works. W:atwill, Jinand, Handsworth, Birmingham, inforin he that, "wing to the rapid development of the electrieal sifle of their hu-iness. they have been obliged, in order to tmake rewn for the expansion, to sell the depurtment which has then known as the Automatic I'roducts Depmenent. 'Jhis deparment, which deals with components and accessorice foll the car. matoreycle, aireraft and genernl enginecring tridion, haw hoon purchased by Senton and Stone. Ltd., Dbacelorib. Stran 13irmingham, and after Jume 20th, when the tamefor takic
 with Best specialities nind other koods listers in the whemen s and Stone, Itd.

## m Moor CAR INSURANCE POLICIES <br> Clearly worded : frec trom amblgultics. Prepared by "The Motor" and o leading firm of Lloyd's krokers. Ranging

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$$ 1927 AUSTIN 2, tourer, very good 1928 SINGER JONIOR, fabric maloon,

alminal new tgren, res. 2929, new
condition 2-peater, excellent condition, tazed, isrex, exiremely umart, wlue. 18258 WIFT. 9 h . de luve touter;

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 MORR19 M1HOR,
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 Welf-athrter, all-wenther equlpment. vers smart sud excellent car ('Riphbary) SIMaER. 19.4. 9 h.p. de Lure 2 -senter, all-werther equipmeat. double and eervicenbie car (HIgbbary)
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TOURERS AND SALOONS.

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 89 Poand. FLAT 9,1928 d-door Saloon, low built, rooms nad altrative. 49 Poond. FiAT 9.1927 Tourer, small molleage, vers well kegs, all 79 Poands. JOWETT 2. 1929 long galoon, very well kept, falls equipped.
 $5 \begin{gathered}\text { follert equinment } \\ \text { fonnds. LEA-PRANCIs. } \\ \text { wheels, ipptop throughout. }\end{gathered}$ 55 Poundi. wheels, lptornthroughout.

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39 Poandi. ROVER $20.192 \%$, 4 -door Tourer. well-kept, Cholce 3 SO Pounds. RILEE 12/30, 1926, 4 -door 8aloon-tspc, allweather, low bult,


 99 Poands. ginaer 8, 1030. 4 -door 8alood,
 89 Poand. salıson, exrra. cholce a othets. 59 Ponnds. SWIFT 10. 1927, dod equiproent. Choico 0 ot heri.
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Owing to postal deiays and irregularities it is adviable to pos: odverusements EARLY ON MONDAY so an to ensure nefor at possible that they reach us by the FIRST POST on Tuesday, Lately acueral advertisements have been received too late for inclusion alehough diupatched on Monday.

## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE

A.C.s. All under $\boldsymbol{£ 1 0 0}$. Sec page 26<br>964-55

A.J.s. domonstration cars for sale. Leeds and Oxley, 439 Edzware Rd.
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ALVIS, lato 19251240 salnon, f.w.b, 4 new tyres, taxed, many extras,


ALVIS, 1925, $12-50$ sports 4-scater, red and black brown ieather up holstery, origial paintwork, in excellent order, good tyreq. $56 \%$. Below
exchanges. Page. 199b Ćpper Richmond Rd. Putney 7671 . Sunday Amilcans. Amllcary (G. Britain). Ledi., 95 1!igh IIolborn), (V.C. 1 AMILCAR. We bold the largest stock of uscd Amitcara

AMILCAR, 1927, 1926 Girand Sporta from 540 . Largest selection of $\begin{array}{ll}\text { sporta cars in (iroat Britain, Upen Sunday rorming. Exchanges, deterred. } \\ \text { Bartlett, } 27 \text { a Pembridge Villas, Notzing Hill fate. } & 964-1 \cup 0\end{array}$ AMILCAR, Shp, Weymana saloon. 1929, taxed, excellent enncilion,
£110. Phoue, Palmers Gicen 3437 .
$964-211$ AMILCARS. All under ※lloo. See page $26 . \quad 964-56$

AUSTIN authorized main dealers Immediate delivery of all modela. $\begin{array}{ll}\text { H.cw and secund hanil in stock, nechange and delarred terms it desired. } \\ \text { Beechings, Lid. Farnborough, Hants. Telephone } 279 . & \text { zzz-718 }\end{array}$


AUSTIN, 1930 saloon, coachbuilt, "excellent condition, any trial,
. 79 10. On leave? Cars supplied on buy-back hasis, on low rloferred terma.
 AUSTIN 7. 1929 tourer, one cwner, excellent condltion, $\boldsymbol{f 6 5}$ Gavenswood, Saddlebow Rd, King's Lynn

AUSTIN 71929 bide door fabric salonn, black and red, beauthlul con-


AUSTIN 7 lateat 1931 light bluc coachbuit as aon, slicling rool. free whel and other extas, flis. Chomley, 18 Belsize Park, N. W 3 .
Phone (erenings), Primena 5538 .

AUSTIN 71930 coachbuilt sunshinc 5 aloon, late del،ers, one owner splendid cundition throughout, written guaranted. axed. unique de


AUSTIN 7 Wo hare sereral, saloons and tourers, for diaposal, pricea ranging from $£ 35$ to $£ 100$. all cars offered are in bood condicion daterred lerms. Ingrase Motors, Ltd, Iugrave St., Clapham Jutuction.
y. Will. Battersea 5360 .

AUSTIN 7. s65!l! 1928 Gordon-Figgand Cup z-seater, colcur AUSTIN 7. 2651111929 tourer. in abinlutely new condition throaghour, Bited with luggage grid, taxed, bargain. Beluw.

AUSTIN 7. e701!1 1929 Wydor saloon, colour maroon, maroca


AUSTIN 7, 59 guincasif Mulliner saloon. 1928-9, many extras. mar 7 Cup model. 1927 (September) in exceptionally nice condition, Anx rasd, 42 guincas. Comerfords. Portsmouth Rd. Thanies Dition. 96454
 AUSTIN 7, 1930 Wydor saloon. £85: choice of three: motsreycles in Hart; deferred terms. Broadway Motors, 19 Woodstuck Si.. Uxtort St.

AUSTIN, 19307 hp tourer. in new condition, 885 cash. or 2810 s ,


AUSTIN, 19"3 7hp tourer, vers good rondition. Laxed. 500 cash or ftd., 28 Queen's Rd. Biyswater, w.2. Yark $7766 . \quad$ Morara $964-295$

AUSTIN 7 hp . 1928 salon, in rery clean cundilion, $£ 55$ cash, or f 15


## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued)

AUSTIN 7. 1927 (late) Cup model, in vers nice condition, fast, layed to end of year, 259 . Below
AUSTIN 7, 1927 coachbuile kaloon, in vary nice order, good tyres, d42 10 s. : exchangesi, deferred. IIaskans, 155 Ladbroke Grove, Nortí

AUSTIN 7. 1930 fabric saloon. excellent conditions throughout, sliding roal. black and red. $£ 85$; 1930 A1sthm 7 tourer, 5,000 miles, as, ncw, £79. G. J. Shaffer and Co., 45 Newman St., W 1. Muscumi 6663.4
AUSTIN 7, 1927, tonrer, black anci rream, in really exceplinnal condition, new hood, llearly new tyres, £48, Wharantecd by Jarvis and Snna,
Lid., Victoria Crescert, Wimbledon.

AUSTIN 7 saloons. Wo bare two in really new condition, e65 and
f85; eagy extended terms. Buntings foxange, Wealdstone. $964-4 \overline{3} 8$

AUSTIN 7, 1927, chummy, in ound condition throughout, exchange, terms, \&35. Ward and Co., 5 Upper Richmond Rd. Putney 2818.

AUSTIN 7. Premier have somo excellent second-hand 1928, 1929 and 19.50 salongs nad tonrers. Very reasonable prices. Write for full list of Largains. Each car guarantecd Terms ol payment to suit purchaser.
Free delivery. Prenter Motor Co., Aston Rd., Birmingham. 964.407

AUSTIN 7 Wydor fabric saloonl! Genuine 1929, faxed lor year, finished black and red, onc owner, small mileage, equal to new throngh,
out, e72, any trial. W. Buh, I5 Kynance Mews, Gloucester Fu. Ken-
siggton, S.W.7.

AUSTIN 7, 1931 eazchbuill sunshino salonn, dark bluc, mileage 200 only, owner exchange lor larger car, 犬122 10s. Heow.
1931 coachbuitt saloon, new February, guaranteed maleago 1,100 only,
1930 (February) sunshinc salnon, black, perfect mechanically, ona
1930 Junel coachbuilt saloon, blue, in unsoiled condition, taxed and
1929 (Scplember) widedonr saloon, black-red. leather wpholstery, extra
1929 (Fehruary) galoon, grey, mileage 13,000, grid, various extras, owner going abroad, £68. Below

1929 Stadiom 3-senter, cream-black, cycle-lypo winga, various extras,
1929 4-seater, maronn, Incse unholstery covers, step mals, dew tyros. one owner, guarantced, $\mathbf{x} 63$. Below

1 228 Gordon Cup 2 -seater, recently overbauled, tyrea almost new, i
1923 (February) Mulliner fabric saloon, maroon, A1 mecbanically, clean coachwork, very attracsive, £55. Below.
1928 (February) coachbuil saloon, primrose-hlack, new tyres and 1928 (April) 4 -spater, kingfinher blue, exceptionally saund, fully equipped, rery reliable, $\& 48$. Helow

1927 (May) Gordon 2 -scater, Game owner always, Triplex, new tyres,
1927 A-scater, bluc, cne change ownership, overhanled March, 4 new
tyres, EAO. Below. 1526 (Narch 4-scater, rigid kide screcns, two owners, overhanled, brakes, clectrical cquipment pericel, 2J4. Below.

AUSTIN 7, s.72 10 : Wydor fabric saloon, 1929, splendid order throughout, taxed lor year. Bell Mator Mart. Lid., Bath Rd., Cippen-
ham, near Slough. Phone, Burnhom 149 .

AUSTIN 7. 1929. Widor black iabric siloon, really excellent condition,


A USTIN 7, 1928 Mulliner salonn, very, good tyres, laxed, luggage trunk
Utted at rear, ball change, many extras, $£ 55$. Below.
A USTIN 7, 1927 clanmmy, taxed, very gnod runner, exceplionally clean,


AUSTIN 7,1930 , 4-seatcr, rery small mileage, beautifully kept tared und complete, fis: exchanges or delerrct. Cumaninge, 101 julbam
Rd. London, $\mathrm{S} . \mathrm{S}$.


## SECOND.HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (conlinucd)

AUSTIN 7, 1928, coacbbuilt salonn, blue snil black, black loather upAUSTIN 7, 1927, coachbuilt. 日aloon, laxed for gear, recently overhauled, acellont mechanical order, repaiguted, 445 below AUSTIN 7, 1928, Taylor 2-scater, red mall cream, Triplex elase, perlect AUSTIN 7, 1927. tourcrs, choico of three, all in pericct order and axed, from £35. Below.


AUSTIN 7. 100 cars in stock, list Ireo. Exchanges. Rowland Smitb. $\varepsilon 8$ deposit, 85 guincas cash. 1930 motlel Wydor \{abric zaloon, mamon, ery exceptional condition, tree year's tax, drew mavance to casta buyers. E6 deposit, 65 guineas cash. 1929 coachbuif salann, bluc, exceptional
$£ 5$ deposit. 52 guineas cash. Tate 1928 tourer, bluc, practirally unworn fyres, carefully used, exceptional order, free tas, fre insurance £4 deposit. $39 \begin{gathered}\text { Below. } \\ \text { guneas eash. } \\ 2927 \\ \text { Inurer, blue. exceptuonally good }\end{gathered}$ condition, free tix. free insurance to cash buyerac. Below. 1927 funally good Rowland Smith, 78.81 High St., Hampstead. Open all weledays including Saturdays, $9-8$, Sundays $9-1$. Onc manute Mampatcad Tubc.
Phone, Hampstcad 488.

AUSTIN, 1930, Swallow coaclubinlt saloon, duat tone bluc, as brabd ew, t.jed jecember, sil5. Helow
AUSTIN, 1928 , Gordon England labric Ealoon, excentionally nice con-
dilion, kaxed, e5s. Below.
AUSTIN, 1927, tourer, lully equipped, grod tyres, recently remanaled,


AUSTIN, Mertom Molor Mart have several Ausim galoons for arle.


AUSTIN 7, 1925.6, 4-scalcr, exceptionally well kepl, \&25. Jelow
AUSTIN
choice of
2, Beluw.
AUSTIN 7, 1928, Mulliner 1abric salaon, splenciad condition, © 48.
AUSTIN 7, 1929 (Scplember), A-seater, all-weather equinped, excellent
condition, Laxed, \&55. lselow.


AUSTIN 7. Brooklands model. 1926, Ginhed green and cream, i new tyres, oulsicle exhaust, full dabh, vil and petrol gavge, go m min, specdn-


AUSTIN 7, 1927 model chummy repainicd roaroon, nickel radiator,
A USTIN 7, 1927 chummy, glarting amil lighting, in very good condition. ع36. Helow


Austin 71931 , collbuill sumfhine saloon, Laxed year, mileage 5,000 ,
namy extras, £ 115 Below.
AUSTIN 7 1950 Iabric *aloon, tased, onc owner, original tyres, rery


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AUSTIN Vewnhanis as Austin agents, alwagg haso an excellent selection of uned nioters of this maico avaslable. Fow examples below, but
mist on reciuest 19307 hp coachbutt sliding-rool saloon, maroon, perfect little car, $e 85$. 19307 Lup chumm5. maroon, run very small mileage only, $£ 75$
 19287 hp coachbuilc saloon, dual colours, beautilul condition through-
w 53 . 1928 7lın elummy, blue, exceptionally nice ordor. $£ 45$

| Kewnhans |
| :---: |
| 4646 . |

 AUSTIN 1928 chumms, excellent mechanicaky, food npmearance and AUSTIN 7, 1929, maroon, splendid mechanical condition and appear
 AUSTIN Svallow, 7928 ; open sporta, rellulosed irorf, and juaroon,


 AUSTIN 1928 7hp A scater, exceptional condition Chroughout, £49: ex-
 AUSTIN 7. $x 48.1928$ coachbuilt saloon, full equipment, exceptional AUSTIN 7. $\mathcal{L} 40$. I938 4 seater, fnll equipment, exceptional condition. AUSTIN 7: $C 55,1927$ 4-senter, full equipment, exceptional condition


AUSTIN 7 sieclo Grimths, agenta of repula ami $\Delta$ astia spocialists
1931 Austin 7 sunshine saleon, as new, عlls
1930 Austin 7 coachbuilt saloovs, ehace of 4, frors 882 .
1929 Austin 7 saioons, choica of 6, from $£ 65$.
1928-9 Austin 7 tourers, from $\boldsymbol{f 4 0}$.
Written guarantees, free driving tuition, after sales serviee, fith lists (Vict. 0467 ): Court llouse, Camberwell New Rd. S.E.S Rodney 2201) ©.G. Huase, Camberwell Gieen, S.E.5 (IRudney 2203).

AUSTIN. Sco the Naylor and Rool bargaina on pago $24 . \quad 264170$


AUSTIN 71928 Mulliner fabric saloon, smart appearance rers clean


AUSTIN 1931750 c.c. Supercharged low chassis Ulster a-seater, mile age 2.OU0, unseratelied, E175: nlso 1931 Austin 750 c.c. Ulster mindel,


AUSTINS. All under £100. Sce pago 26 .
964-57
AUSTIN 7. Renno's. 1929 Garden England asloon. Triplox glass, like new, 75 guineas, or terms, $232 \cdot 3-4$ Upper St., Isington, N.1. Year
Tubes. $H$, AUSTIN 7,1927 saloon, coachbuilt, frimirose snd black, perfect condition,
T'wickenham. Popesgrovo 1454 . and delerrad. lalmors, 53 York St.
$964-581$

AUSTIN 7. Finchley Motors ofice, 1929 saloon ne owner, not used


AUSTIN 7, 1925 model aports 2-seater, orerhauled, engine rebored, new nistous, etc., fitted by Austin Motors, recoachpainted. excoptionally


## SECOND-HAND (continucd).

AUSTIN 1930 7hp tourer, S80, also 1950 ihn Nustin 2-beater, ego
 AUSTIN \%, 1928; Gorion England Cup model, in really $100 \%$ condition throughout, thashed in red and black. small mileage, for. or exclingge motorcycle or Morgan. 3ड9a Goidbawk RU. W.6. M64.320
5123 .

AUSTIN 7. £115. 1931 caachbuile sunshine saloon, blue and black slidigg rool. pneumatic unholstery iotal miteage 3.200 , equal to new (licensed to December 31st); delerred terms. Pbillips and Powis,
$10-24$ South St., Reading. Phone 2600 .

AUSTIN 7, Stadmm 2-rcater, late 1929, very sman mileage, complately


AUSTIN 7, 1929 Cup model, one-shot lubrication, splendid ondition
 Chiswick 0303 .

AUSTIN 7s. Carlton Garage 19307 salong. Wsdor, 83 guncas V27 Cup sports. new Irres. 49 guincas: ferms, exchanges. 79 Ciarlion

AUSTIN 7. Brcoklands Motnr Co others: 1931 fahric galoon, upholtered in leather, mileage under l,non. uycd for demonstration purposes Huseum 314ぶt. inchanges, delerred. 351 Euston Rd., 964-376


AUSTIN 7, 1930, saloon, in new condition, 887 los.; exchange or
deterted. Whitbys, 7 The Vale, Acton, W. 3.
AUSTIN 7. 1931 saloon. taxed year, mileage 3,000 only, coodition As wew thrcughout, £115. Below
AUSTIN 7, 1929 enachbuilt close-coupled saloon. taxed. excellent conditlon throughout, £75. Pauland Co., 114 Gt . Portlaud St. Muscum

AUSTIN. Bournemouth. Black and red fabric saloon, clean, smart, two new tyres, any trial, terme arranged, $£ 70$ or near offer, 1929 model.
Phone 1993. Sinflice, Poold Ifill.

AUSTIN 7. Cooke's Motors offer sescral bargaing 1927 4-seater, 239 ;


AUSTIN 7s!!! MLmphress, Ltd., offer this week:-
1930 Widor aaloon, black, chromium, rery small mileage, as new, £89. 1929 Wydor saloon, maroon, taxed December, tyres unmarked, beautiul mechanical condition, magniticent uppearance, 578 103. Below.
1929 coachbuilt aaloon. maroon and black, excellent tyres, leather upaolscery, taxed, amall mileage, beautıful order throughout, $£ 76$ 10s. Balow.
1 g28 Wydor fabric salcon, blue, laxed, very clean, excellent mecbanical condition, 260
1927 Chummar, bluc, full all-weather equipment. clock, speedometer, screen wiper, etc., good tyres. really exceptional condition, bargais, £46. Your motorcscle or present car taken in exchange; deferniopay
ments. Humphesc, Lid., $120-2$ IIampstead Rd., N.W.i. (Two minutes
964.222 Easton Statian.) 'Phovie, Museum 9515.

AUSTIN 7s. $1926 \cdot 28$, orerhauled, insured and ready for the road. $\mathbf{8 3 0}$ ta \&SO. Ruffelli Motors, White Ifart Live, Barues. Prospect o549. 964 -263 AUSTINS. F. G. Smith (Motors), Lid., Austin 7 sporis 2-suater, Goodmayes, Illord. 'Phoce, Seven Kings 1000 ( 7 lines). balance $964-247$

AUSTIN 7. 1928 tourer, in maenificent condition througnout. fu!l equipment, hood, sde curtasns, perièt, 43 guineas. R. larsons, 91 Arcon
Lane, Chiswick. Phone 6028 .
96432

AUSTIN 7. 1927 llatel tourer, perfect condition, insured Tuly, barazain.
f33. 298 fulham Rd. Flasman 8239 .


AUSTIN 7. 1930, sunshine black fabric saloon. mileage 9.000. new condition throughout, $£ 8 \% 10$ s. Wrest Villa, Wolsey Rd., Esher, Phone
Esher 352 .


AUSTIN 7. The Specialists have Burghley Con ond KC. specials from £40, saloons from $\ddagger+5$. wurers from fus. Glover-Motors, 35 Chel
verton Rd. putaey 7134 .

## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued).

AUSTIN. A. Rix offers 1930 Austin 7hp Swallow saloon, taxed, in


AUSTIN 7, 1931, opal bluc. coachbuilt sunshine saloon, extra side hight stop light, Porlock, mileage 2.500 and condition in keeping. iayed. accept sili5. Hachanges entertained. Wilson Motors, $964-260$
non St., Victoria. slosno 7201.

## AUSTIN 7. £65. 1929 Wydor saloon, really beautiful order through <br> AUSTIN 7. E42. 1928 chummy, rery nice condition, good tyres and Lemi exchangem, deferred. Maynaris, 24la ligh Rd., Wood Giecn. 964 .271

AUSTIN 7, 1931 ccacbbuile sunsbine salcon, proctically new, ell5. Below

AUSTIN 7, 1929 (July) coachbuill coupe, just reberell Laystall, excel lent tyres, beantiful condition throughout, s68, taxed. Ifyans Bros. and Jleard, 19 Deynon lid.. Carahalion. Tèl., Wallington 1917.64-525

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AUSTIN 7a Andrewa Automobiles for Austin 7 barsains
```

AUSTIN 7, 1927-30, tourcra and saloons, $\mathbf{x 4 0}$ to $£ 90$, ready for the rvad, taxed, innured, and cuaranteed 3 months: simplest hire-purchas zuheme in existoure Write for lish of 100 light carts of eall


AUSTIN 7. 1930 Arrow 2-seater, taxed year. perfect condition, amall

B.S.A. Let $G$ A Norchi demonstrate this fine englneering job to sou, the essy running will amaze you
B.S.A. Irom Hackford Notors, Lid, for exchanges and casy terms. 182
Acre Lane, Hriaton. Phune 3062 .

BUGATTI. We apecialize in these cart. 1929, 1928 and 1927 is slock. W'ritten guarantec with overy car. Largest itock of aports cars iu Greal Brilain Upen Sunday morniug. Exchames, deleried. 13art-

BUCATTI, $\mathbf{E 3 0 ! !}$ Breacia, Foller hearidg. Compton's j-acaier, mports inmly, first rebislered lile 1926 good batitery orer 70 m.p.h. and wil ynt nil up; exchanges. Metro Motori, 45 vewman St., W.1. Muscum
y 953 . 289

BUGATTI Carlion Garagr 1924 clover-leal pukka sporin, 29 guneas:


BUGATTI, 1926, 11'jlitre modifed Breseda 4-seater sports, model 2556
 7671. Sundays 10-2.

CITROEN, 7.5hp cloverleaf, practically as new throughont, 5 new esres laxed tor year. E23: lerma and exchangcs. Crosb, 54 Durham Ril.
S. W. 20 . Phore. Wimbledon 2558 .

CITROEN 7, 1926, cloverlen! 3-seater, almost new tyres, very amart and sound, eaxed. \&18: another. flS: exchanger, IDstalments. Nor Inger Sundays.
Upen Sula
$964-160$

CITROEN 7, late 1925, Cloverleaf 3 -seater, very smart, been beautifully kepl. Largain s15; exchames or deferred. Cummiuge, 101 Fulham
Rd., London, s.W.3.
$964-149$ CITROENS. All under £lUO. See page $26.964-58$ CITROEN 7,1926 cloverleal $\overline{3}$-acater, $=$ plendid condition, 1axed, $£ 15$;
 CITROEN 7 . 1926 clorerleal, Laxed, 3 new tyres, 214 . 181 The Grore
$964-224$

 CITROEN 78, 1925-6. fully equippod, sound condition, insured, £15 to £25. Rufiells Motors, White llatt Lane, Barncs. Pruspect 5549, 964.260
CLYNO, 11 hp 1928 fabric body 2 seater and dickey, well maneained
 exchanges. instalments. Norringtans. Wid. Rivernde 2365 . Open Sundass.
Sush.

CLYNO, 1927 model de iuxe falown, 12 hp Rngal. Inur dourn, leather uphalatiy, blimk bsorber, ballwan-, cigarette lighters, rear blinds, rumb bratifully, esaminatie. invitid, saerifire
lid. Willeaden Green, W. WO. Willesten 2469 .

# SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued) 

CLYNO, Royal tourer, 192', in periect condition. original paintwork $n$ q new, leather unhnistery, new tyres, 225 . Cross, 54 Durham itl is. W. 20 .
Phone, Wimbledon 2558.

CLYNOS. All under . ©100. Sec page 26.
$964-59$
CLYNOS. Andrew Automobiles for Clyno bargaing.
CLYNOS, lourer and saloons, 110 to $£ 60$, ready for the rond, taxed, insured and gnarantecd months. simplest hire nurchase ecticne in
 CLYNO Royal 1928 tourer, 10.4 hp, f.w.b. (axed, real harkain, 37 Guineas. Chantry Mators (Iormerly South Ealing Garage), 30 Tinuridge
Rd. Wi. Ealing $4161-2$.


CLYNO, 1927, 11 hp 4 -seater 4 -donr salonil, I w.b., good is res, meelinnice


CLYNO, $1928,12-35 h p 5$ zeater, maroon, 3 new Micticlins, repainted
1927 Royal 4-ceater, maroon, dew tyres, rear screca, in mangaficeut con-
dition, f30. Below.


CLYNO, 1928, suner de luxe, latest model touring ear, anl also 4 -dons


COVENTRY-VICTOR 1931 famils model. unused, shop-soiled onig, etartang and lighturg. exchanges or terms, 295 . Ceorge Taylor, 442 Corentry
Rd, Birmingham.

FIAT 12, 1927, 4 sealer, 4 speeds, f.w.b. and full equipment, a goond


FIAT, 1928 , drop-head coupe, Bhp, many extras, very goorl tyres and
a really smart car, $£ 58$. Melow. a really smart car, £58. Below.
FIAT, 1927. de luxe fomer. Iw h sido screens, gplendid rondition.


FIATS. All under $\mathfrak{x 1 0 0}$. Sec pago 26.
964-60

FIAT. See tbe Naylor and Root bargains on page 24.
FIAT, 1928 drop-head coupe, in splentid condition throughout, appear-


FIAT, 8hp ealoon, lale 1926, fast and sound, f55. Denmann, 132.3
Long Acre, W.C. Open week-ends. Tenyle Bar 8135-6.7. $964-432$

FRAZER-NASH Nars olfer for sale or exchange a number of ncell cart


## If you have

a "used" small car, or any small-car equipment, for disposal. try the effect of a small advertisement in these pages.
There is no better or quicker means of finding a customer.

## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued)


GWYNNE, \&65!! 192810.40 de luxe 2-acater and dickey, realls high

 HILLMAN, 12 हuineas, insurel. 9.5hp Brooklands sports 2 sacater, out-


 HUMBER. Bhp, 1924. chmmmes. ctarling and lichting, pull equipment.




IMPERIA,
Sanger
1
JOWETTS. 1928 lung \& enter, and 2-seaker-. 575 : 1929 short fabric salnon \&86, Co.

Jowetts. Mawtetor 1937, 1938. 1929 and 1950 salonns. tourers,
 JowETT, 1926, iourer, June delivery, blue black, one change owner


JOWETT Chingloril Automobiles, Led. diatributors and enginecrs. JoweTt long louror, 1925, taxed, ans trial, £23. Moss, $20 \begin{gathered}\text { Mirritird } \\ 964-2206\end{gathered}$


Jowert 7. 1927 moicl, Zasenter and dickey, long chassis, atarter and
 Open Sundays. Putacy Bridge Rd., Wandsworth. Phonc, Puthey 964 an2
dOWETT, 1929 (Tune), leng 4 -door sinhon, cxcellent coudition through

'UWETT alonn, short, blue fabric, perfect condition. 16 Watlisficld
Rd, Clapton, E .5.
$964 . a 235$
JOWETT, 7 hp, 3926 , long elassig, 4 senter, excellent applearance and condition, e2a; nnotlier, with nltractive nluminimm borly taxed, s32; exchange inglalments. Norringtons, 245 Goldhawk Rd., Shepherd's
Bush, W. 12 . Ruerside 2365 . Open Sundays.
$964-159$

JOWETT 1925 long-chassis tourer, 5 nearly new tyres, taxed, Tara
 JUWETT, 1924.5, z-scater, leather upholstery, glarter, good tyrea, nice Condition, Cl7. Rultels Motor: White Hart Lanc, Barnes. Prospect
$\mathbf{5 5 4}$ 964-261

JOWETT. F. G. Smith (MYntors) Ltd. 1930 Black Prince saloon: this car has been very carelully used; deposit
Goodmayes. Illord. 'Phonc, Seven Kings 1000 ( 7 lines). balance 9100 . 964.248

JOWETT. F. G Smith Motorsl. Lid. 1938 4-door s.inon. Laxed for


Jowetr, 1928 2-seater and diekey, taxed, 2 spare whelg indis-
tınguibhable from brand new, f36. $3\{3$ Hereford Rd., Westbourne


Jowett 1927 long 4 lourer, any trial. 2 Litlle Woodeote Fgiate. $964-242$
Whllington.

JOWETT fas. exthancert $1928-9$ long chasis $2-s e a t e r$ dickey in


## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued).

JOWETTS. F.O.C.II the distributora, have all models in ntock. Come to ul for the cheapext guaranteod Jowetts In London. Caxh. exchange stead 3752. Close daily at 8̀ p.m. : Sundays 2.30 . $964-2.22$

JOWETTS. All under $£ 100$. Sce page 26.
964.61

JOWETTS. Aodrewa Automobilea for Jowett bergalna -
WOWETTS \&1S co R3S, ready for tho road, taxed, insured and guaranhecd montha amplest hirepurchase acheme in existence. Wrila



JOWETT, 1930 Blark Prince long cbascin aloon, black-red, wire
whecls, bexutiful order throughout, Iaxed, fils. Bclow. 1929 aloon, long chansia, brown, ecry completely fived, one change onls. owner buying naw hodel,
1927 full 4 -acater, blue, good tyres, one owner throughout, taxed, $£ 40$.
1926 (July) full 4 -sealer, blue, same owiner since new. $\angle$ horns, various cxeras, £33. Helow

Smith and llunter. IAd, 407 Edgware Rd. Ambassador 1011 Eren-
ing: 8 . Saturday 6 . Sunslay $10-1$.

JOWETT, 1929, short chasis tourer. very clean enndition throughout. f62. terma, exchangew. Page, 199b Úpper Richmond Rd. Putney
7671 . Sundaya 10-2.

JOWETT, 1922. $7 \mathrm{hp}, 2$ seater and dickey, good tyres, very snanil


JOWETT. f4 deposit, 39 guinear cash. Late 1928 Tbp Inng 2-seater, blue, carclully used, exceptional condition: tree tar, frec insurance fa dayı, including Saturdays, 9.8. Sundays 9.1 Rowland Smith, 78.81


JOWETT, 1927 (July). 4-scater tourer, logg chasis, exceptional condidow itt, 1927 (July). 4-scater tourer, loge chanis, exceptional condi-


JOWETY, 1929, short chassis brown fabric saloon, condition almost as new, £69; exchunges, terme. Below.

JOWETT, 1927, short 4 -seater, one owner, verg good condition, dipping headlights, E29: exchangen, terms. Yarwodd, stoneley South, IIgh Rit
Tottenham. Yhone 3122 . $964-275$


JOWETT 1927 (July) 7hp, taxed. 2-ieater, good dickef, long chassis,


JOWETT, 1929 long saloon, maraon, perfect condition, many exiras.


LAGDNDA, 1924, 2-scatcr, in excellent condition throughout. good balloon eyres, pasun atic upholatery, f9: exchanger. Cross, 54 Durham
Ru., S.W.20. Phont, Wicibledon 2558 .


LEA-FRANCISES. All under f100. See page 26 . 96463
LEA-FRANCIS, 1927, 12 hp 4 -dror saloon, 4 -speed, I.w.b, just over1925 (July) 12 hp tourer, maroon, good iyres, 832. Smith and Uunter.
Lid., 407 Ediware Rd. Evenitis

LEAFRANCIS, 193612 hn 4 -5-seater, 4 -spied, f.w.b., real lenther up-


M.G. Mitget, 1931 , Shp 2 -seater, really splendid condition throughout,


## SECOND.HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued).

M.C. The Central Notor Institute, Finchley RA. Hampatead. Nill 3
 cars aluaya in slock. Phonc. Primrose 1161 and illtchin 4y4. 722 - 375
м.G., 1930 special Double-Twelve ear, \&165.
M.C. 1930 Nit'get. bis sump, choice o! j, from 1150 .
M.c. 1931 Midget, black and red, as yew, el45.
M.G 1929 \inlset, blne. f95. Exch.inger. cleferrect. !-argnet alock ol sports cara in Great Bratain. Dartlett, 27a Pembridge Villas, Notting
Hill Gatc.
$964-102$
 25 Viast Mill, Clapham Junction, S.W.11. Phune. Buttersea 6187.9 .
Mic. Niliget 1930 -scaler, taxed for the year, really first-class condition. exceptionally line ehavin. everrtimg pericct.

M.G. Midget. See the Naylor and Root bargains on page 24. 964-174 m.G., 1930 (August), Midget sports, red, mileage about 5,000, quite 1930 (July) Midget sporl- broalt-base sump, quite unseratehed condi-

 9520-1.
M.C. Midget. $£ 12$ deposit. 119 guincas cash. 1930, super enorls 2 . seater. red, ribbed hrakes, excellent condition, free tax, free insurance to ash, buyers: 100 fars in slock, list free; exchayges. Onen all weekHigh St. 11 ampstead . One minute Hampstead Tube. Phone. IIamp.
M.C. Milgel, 1930 (1ale) sportsmans coupe taxed sear, bis sump. Mondition nim 1925 .
M.C., 1930. red 2 -seater, only done 1.000 miles, new condition, taxed

M.G. Midget, 1950, conpe, grey and blue, guaranteed by the M.G. dia-

M.C. Jarvis of Wimbleclon MG. distributors, offer 1 wo Midget shap.


morgan. Rearls of Kingsinn. Morgan dipributors and apecialists. Ncw and garanteed becond-hand


MOPGAN Scrvice Depot, Officinl apmointed rapairers for the Morgan Holnr Co. for Londong.

Morgan. Maskell for Mormans. Sole London azento south of the


MORGANS'1! About 1925-26. 1926-27 family 4-zeaters, Girani Prix Exchanse motorcycles: onsy lerms. Wandsworth Notor Exchange, Fbner Exchange motorcycios; onss erms. Wandsworth Notor Exchange, Ginner

MORGAN, 1925, da fuxce dynamn lighting. merbenicalls pertect nocd


MORGANS. Momaris havo lor dispoanl the following guarantzec 1929 super-sports, o.h.x. A.P.. dynamo lighling. spectometer, Dunlop ev nims. very fant. guaraniecd perlect, 287 10, Below.
${ }^{192 ;}$ Family, 8 hp J.A.P., dynamo, speedomeler, side screcni, $£ 39108$. 3927 De L,uxe ${ }^{8 h n p}$ dition, A.P., dynamo lighting, side sercena, excellent con-



Deferred termas arranged.


## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued).

MORGAN. Naslur ani Ruct, Lid.,
MORGAN spectalists.
Hishest exchange allowance for your present macbine and the balance extended civer 12 or 18 months
Satisfaction guarantecd. Send for nur lise giving detailed specification £110. 1930 super-snorts, o.h.s. racing , T A I', many extras, really beau tiful condition, Laxed; alio one at £ios.
fg9. 1929 superspmrti, similar to sbove, finthed dual lone. cycle rings, many extras, vers attractive.
 scheme
sci2. 1928 . Lero, s.v. J A P. starter, f.w.b., cycle wings. f.ut accelerator天62 1928 Acrn, o.br. Anzani, Iw b, hoot, specdcheter, new tres, original coach finisly maroon, as new
E57. 1927 Acro, oh.s racing J. A P. if.b., Es. wrek hroul, :pecdo£ 21925 Aero, o.h A. Anzani, fond tyres, spectometer, hood, re-
painted dark blue, excellent condjition. f68. 1930 Frmily 4 -scoter, a c. J A P., f.w.h, spectometer, ide creces gond tyres, small mileage, very smart
 $\mathbf{4 5 9} 1930$ de luxe, a.c. J A $P$ M. chascic, starter, scod |wre-, usugl £39. 1927 de lnve 2 -senter, w.c. J.A.P, specionimter, geol tyres, exceplional condition, taxal December.




MORGAN. 100 cars in stock, list Iree: exrhange. Pomlithel Smilb. £g deposit, 82 guineas cash. 1930 medrl, Acrn, 1.100 n.h vi sperially new condition, free tax. free insurance to cash buyer. iselfiw make £8 tieposit, 82 guincas casb. Late 1929, вuper Jern. spmonlls tuned racing o.h.v. J.A. $\mathrm{I}^{2}$, black and red. cycle-1ype winc. 'trathethhrough exhausts. reduced steering, carefully yived, exceptional ehithrion, fred
lax, free insurance to cash bugers. Below.
£7 deposit, 75 suincas cash. $1929-30$ Acro, 1,100 oh $v$. racing J.A P., ing, bood, farefully ubed, new comdition, free tax, free ansuramce to cash buyers. Below
s6 deposit. 62 guineas cash. 1929 molel. Aero, Ghp nh.v. w.ec Anzeusts, excentional condition free Below.
£6 deposit, 62 guincas cash. 1930. Family, 8hp T A.P.. I w.b., cisnaman lighting, hood, afic screens, emall milenge. earefully úcul, practically new condition, free tax, free insurance to caab busers. Deiow
$£ 5$ deposit. 55 guineas cash. 1929. Acrn, 8lup I I Preen, dynamo ighting. I.w.b., reduced steering. hood, exceptional condition, frec tax, E5 deposit, 49 guincas cash. 1927 , Aero, 1,100 o.h.r. racing J.A.P. cream and order, frec tax, free insurnuce wo cash husers. Belowinasts, very £3 deposit. 35 guincas cash. Late 1926. Family, 8hp w.e. J.A.P. dynamn lighting, spectometer, electric horn, carefully used, excepional
coudition, frec iax, frce insurance to cash buyers. Below. 83 deposit, 29 guineas casb. 1928, 8 hn J. A.P. black and red dyanmn lighting. $1 . w . h .$, very good condition, frec tax, frec insurance
\&.5 deposit. 29 guincas carh. Late 1925 , Aero, 8hp o.h.r. Anzani, red dynamo lighting, hood, f.w.h., straight-through exhankt, Acro screcns, nonniksen, foot acrelerator, reduced stecring, practicatiy unworn tvres, very sood order, frec tax, frec insurance to cash buyers. Below.
Rewland Smith, 78-81 1Iigh St., ITampstead. Open all week-dass, in Phone, Ilampstead 4881. 964.193

MORGAN, Acrn, 1926, J.A.P engine, collapsible hood, gnod condition, MORGAN, Aern, $19 \% 9$ model, J.A.p engine, very altractive and sound
iw.b., taxed, f45. Below.

MORGAN, sperial linoklands model, 3928, Witio track, almost new cxelianges, istitalmente. Norringtan's 245 Goldhawla Rd., Shepher Bush, Wiz. Riverside 2365 . Unen Suhdays. 964158

## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued).

MORGAN, 1926 Acro. Blackburne, nerfect conditinn throushout. gemi


 1926 (Suly) Acro JAP, red-cream, dynamo specdometer, 2 new tyrea,


MORGAN, 1929, de fuxe, w.c. J.A.P., dynamo, starter, Iw.b., perlect. MORGAN. 1928. do luxe, JAB., w.e., paintwork, upholstery pertect, MORGAN, 1925 , Acro, o.h v., S.w.b., geared ateering, dynamoo recellu-

Below, 2923, do luxe, S.A.P., dynamo, good tunning order, $£ 17$ Melow.

 10-2.1 -364-201
 MORGAN 1930 Super Aero 10.40 oh.v. J.A li., enparale headlampa,
 5 Putney Bridgo Rd. Wutney 2728 .


 MORRIS Minor Arow coupc 9901930 (April), genuine mikeage only
7,000 , 2 -colour scheme. ©ruen and black, wany extras, one owner, Laxcd,






Morfis Mtinner, 1930, anloon, faluric, one owner, fuaranteed faulthess,


MopRis. Nownhama always have an excellent eelection of used cera
MORRIS Minor, 1931 , 8 hn , oh.v, conchbuilt opening root saloon, 1929 Bhp labric salood, very nice condition, 259.

Nownham Housc, 237 Mammeramith Rd, London, W. 6. Rirerside 4646.
MOARIS Minor, £88. 1930 coachbuill saloon, sunshine rool, complete equipment, new condition.

MORRIS Minor, 265. 1929 fabric anloon, compteto equipment, excepmonal condltion.
MORRIS Minor, 560 . 1929 4-senter. completo equipment. exceptional conditioni exchangob, deterred. 86 Acro Lane, Brixion. Phong 3401.



Monfis Minor sports 2 -acater, mileage under 2,000 . cream and green,
 MORRIS Minor, F.O.C IT. otler 1931 raloon, nimost new, bargain


MORRIS Minor. 1929 4-scater, blue. exceptional condition, $\boldsymbol{5 5 9}$. Roso ad Young. Lid., 97 Sireatham Iliti. Tele., Streatham 9520-1. 964 -300

# SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued). 

MORRIS Mínori. Andrewa Automobiles lor Mortis Minor bergaina:-
 taxed. insured and guaranteed 3 moneha, amplest hire-purchaie acheind


MORRIS Minor 1930 saloon, in excellent condition, fabric, 80 guineas.


Monfis Minor. Sec the Naylor and Rost bargains on page 24. 964-178

MORRIS Minor. f7 denonit. 75 guineas conh. 1929 fabric azloon, lifown, carcfully used, very exceptional condition; frce tas. Irece iniur:
ance to cash bugera; 100 cara in atoctr, list iree: exrhangen. Open ali ance to cash bugeri; 100 cars in stocry list Iree exrhangen. Open ait


MORRIS Minor, 1931 anshine maloon, bluc, run aegligibla mileage,
lulf guarantee, taxed December, $\& 120$. Bolow, 1930 (April) sunshine saloon, dask maroon, same owner throughout, hollean order, faxed year, \&100. Lark mam

1930 fabric saloon, blue, sound mechanically, moderate mileage, full 1929 (July) salonn, blue, samo bwner alwayn, beautilully clean, guarantee giren, s70. Below.

Smith and Itunter. Led., 407 Fidgware R.l. Ambassador 1011 Eren-

MoRAIS Minor $19: 39$ naloon, condition as new, small mfleage, $\mathbf{2} 65$.

MORRIS Minor, 1930 taloon fabric, very little uted, e79; algn 1930 narhbutic lolding roof, as new, f90, exchanges, delerred. Empire Motora, 506 Hish Iid., Chiswick, W.4. Mours 9-9. Cblswick 0303. Monfis Mincr. Cooke's Molory oller unregiatered 1930 coachbuile



MORRIS Minor Premier have some excellent second-hand 1929 alons from $£ 70,1930$ maloons from 280 . Fach oar overhauled and in splendid condition, terms of payment io nuit purchaller. Freo de-
livery. Premicr Motor Co. Aston Rd, Birmingham.
$\mathbf{9 6 4} 408$ PEUCEOT, late 1926 , 11 hp fourcr, laxed, rery lant, goarl condition, 218. 68 Cromwell Avenuc, lighgate, N.6. Mountvicw PEUGEOT 7, 1927 (lato), nll-weather 4-seater, Hearter and full equip-
 Sundays.

PEUGEOT 71927 model all-weather 2 -seater and dickey, starter and Jull equipment, vers pond condition, small mileage, R20. Central 4466. Open Sundeys. $964-2 \mathscr{2} 22$

RENAULTS. Tho following cars, together with several othery, carry our unual. guaranteci deferred terms, part exchanges arranged. Cat and torif, Surbiton IIIll Rd., Surbiton. Elmbridgo 1873.
153112.5 hp Monasix saloon de luxe coachbuilt shop-soilerl, unregiarered, $£ 165$.
$19309-15$ saloon do iuxo coachbuilt, chromium, bumpers, tax paid, 192912.5 Monanix coarhbuilt raloon, bumpert, chromium, etc., $£ 110$. 1929 n-15 saloons do luxe, Weymann or coacbbuilt, bumpera, carrier, c:c. $£ 75$ and
192812.5 Monsaix Weymann salnon, bumperi, carrier, spotlight, indicator, special job, tax paid, 570.
1028 9-15 coochbuilt maloon, bluc, wire whecls, tax paid, e60; aleo
carlier models, $\& 45 . £ 50$.
1928 9-15 tourer do luxe, blue, excellent nrder, e\&0. 964-70

RENAULT. Sec the Ninylor and Root bargaias on page 24. - 964-176


## SECOND-HAN'D <br> LIGHT CARS AND CYCLECARS FOR SALE (continued).

 iw.b.. £22. 160 Trivity Square, Brixton, S.W. Phuno 4549. 964 -a: RENAULTS. All uuder $£ 100$. Sce page $26 . \quad 964-63$
nenault 9. Andrems Automobiles for Renanit bargalas:-
RENAULT 9, clit to s36. ready for the road, taxed, insured and gunranteed 3 months, simplest hirc
for liat of 100 light cars, or call.

Andrews Autamobiles, 37 Sheen Lane, Mortlaka IStation). Phone, Rich-
mand 0576.
 scratched, 98 guineas terma, exchanges. 79 Cariton Vale. Kiburn
(10 mins. from Marble Arch).
$964-386$
RENAULT, 1928, de line 4-scater, Tecently very thoroughly overhauled at cost of $£ 20$, a bargain at $£ 39$, also 1926 4-seatcr 10 urer, nue owner, little used, macrifice, e17 10a. Falkland Fark Garage, 179 Souih Nor-
wood 1111 , South Norwoud. Livingstone 1000 .

RILEY specialista. Writo for list of gharanteed used cars to Suszex
Distrbutors, Lewee Motors, Lewca.
Riley 9 1931, Phas series Monaco sunshine kaloon, run 350 miles


RILEY 9. £195!!! 1930 Moneco saloon, coloar dark blue, cream whecln, amall milenge, carclully driven by one owner since new. Morgan
liatings. Litd., 212 New king er lid. (opposite Putaey Bricge zzz-358

RILEY. Reward for person giving information leading to whereabouts engine No. 15832, chassis No. 606242. 7 Gladstone Rd. Meols Cap..

RILEYS. F. G. Smith (Motorbl, IId
RILEY 9. 1929 special sports $2 \cdot$ seater, twin carburetter, double
RILEY 9 sports 4 -scater, 2 chade blue, brand-new tyres, taxed for jear, deposit $\boldsymbol{2 5}$. balance 295.
RILEY 9 special sports 4 -beater, twin carbureters, deposit £jo,
RILEY 9 Monaco saloon, 2-tone gres, with blue wheels, deposit £3S, balanca $\boldsymbol{x} 90$.
RILEY 9 special Brooklands mode! tared for gear. rery fant. deposit


RILEy. Truscott for saloonf. 3930 9hp Biarritz saloon, black. green


RILEY 9, brand new, unlicensed, and unregirtered Monaco aaloon, tlue and black, full maker's guarantee. fell Bell Motors, Church St.,
Stainea. 'Phono 401. Open Sundays 10-1.
Y64-108

HILEY Monaco special saloon, 1930, 2 carburcters, suring stecring wheel. Triplex glass. red wheels, exceptisnally fasi. pitlers candition,


RILEYS. 400 Car List post frec. 3924 to 1931 new and used cars
in stack; saloons, coupeb, sports. landauleta, tourers, 2-soaters, etc.; in strek; saloons, coupes, sports, landaulets, tourers. 2-scaters, etc.; no object. TTiae Northern Notor Olympia.l Bambers, near lirkazle Station, Soutbport. Phone, Birkdale 66]61. (Branch Showrooma at
4 Guildiord St, Leeds, and 16 Cambridge St., Shefficld.)

RILEY 9, 1930 special tourer, two carbincllers. spare wheel unused, tonneau cover. rand new condition. mileage 7,000, black and green, has been stored for many moniths bargain $£ 195$. Rose and Young. Lid.
97 Sirealham IIll. Tele., Streatham $9520-1$.
$964-504$

RILEY 9 Biarritz faloon. Girst-class condition throughout, 2155 cash,


AILEy. ciz deposit, 225 guineas ensh. 1931 model, 9hp Plus series Mcinaco aaloou, black and red, one owner, brand-anew condition, free lax,

RILEY. E14 deposit. 139 mincas cash. Lato 1929 9hp Mark IV Munaco saloon, blue, Triplex, carelally used. exceptional condition, freo
tax, iree insurance to cash buyers; exchanges. Rowland Smith. Below.

RILEY. Elo deposit, 99 guineaz cash. 1928 Monaco saloon, biuc. exceptionally good condition. free tax. free insurnace to cash buyers ; 100 cary in stock, list tree: exchanges. Open all week-daya, iveluding
Saturdays, 9.8 , Sundays $9-1$ Ifowland fmith, $78-81$ ligh st., llampstead. Onc micuto Hampstead Tube. 'Yhonc, Hampstead 4881. $964-190$


## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued).

 RILEY. Jarris of Wimbledon ofler 1930 Barritz suloon, Whalk and red,

HILEY, 99 guincas. 1928 saloon, henutiful condition. $100 \%$ taxel for Year. Bell Mntor Marl, Lid., Bath Rd. Cippenham, Mear 149.
ROVER 1929 Rixiera $10-25$ sun hine ealoon, maroon, lirand now bal1929 (Fobruary) 10.25 4-dnor Paris faloon, maroon. Jnallogr Multolstery,

 1928 (Aprill 10.25 4.seater, all latest improvernents das: Ni,uc, frid, 1925 9hp 4-seater, maroon-black, in good running crder, 10 Henr, et 18.





ROVER. Nexnhams nlmays havo an excelical belection ur u-ed cars
 tionally attractive car, 195 .


ROVER 101931 coachbuile 4 -door 5 -seated salood, one juriot, excel-
 nover 1931 J'amily 10 caschbuilt. saloon, lark bluc, nalleage 3,000 lato owner forved to sell, taxed December, bargain. 4165 exchanges

nover 91925 4-seater, enging ihnroughly oserhauleci, new hood,
 ROVER. See the Naylor and Root bargains on page 24 . $964-172$

ROVER 10-25 sporisman's coupe, late 1929 , filfd bumpers, etc., ROVER 10.25 sporismans, colle,
small mileage, car like new, \&115; exchanges or deferred. Cunimings,
101 Fulliam Rd., London, S.W. 964.150

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If you are thinking of disposing of your old car, try an advertisement in the Sale and Exchange Section of "The Light Car and Cyclecar" which has a wide reputation for immediate and satisfactory results. You will note that all advertisements in this section are classified according to make of car this simplifies reference and makes it easier for buyers to find the type of car they are looking for
" THE MOTOR BOAT MANUAL." 10th Edition. A Praclical Handbook for

## LIGHT CARS AND CYCLECARS FOR SALE (conlinued).

ROVER 1930 10.25hn Weymann sunshing asaloon, 6 wincoows, ROYER 1930 10-25hn special sorhbuilt knimon, 6 windows, leather aiphol-tery, =mall milceser, as mew, e160. Below.
nover 1950 10-25 Weymann snloon, 6 winclows, leather upholntary,


 ROVER, 1931 10-35ın Ralrric salnon, 1 diover. zliding roof milcage 900 , ROVERS. - lil unier f100. Sec page 26.

964-64
 ROVER 9s. Andrews Automoblles for Rorer bargans:ROVER G ely to f68, ready for the road, taxed, insured nnd for list of ion lighti cars, or vall.



 5.000 Pulnes $2818 . \quad$ C. 52 10s. Ward and Co., 5 Upper Richmond
 ROVER 10 C82 108.1928 fabric snloon, sun rool, taxed December,
$100 \%$ chnduluh Hroughout. Below. nover 10.245 10\%. 1927 de luxo Lourer, tnxed, dnol-colour echeme, dehnit.Iv a
led. Puney 2818 whange terms. Whrd and Co., 5 Upper Richmond
954.441 SALMSON, 19267 witey Gurla, perfect running order, $£ 30$ nr near
$964-a 80$

SALMSON 1 ת2, 10 hip 4 -scator, bluc, hrown leathar upholesery 4 new
 Puincy, 7671 . Sundayı $1 \mathrm{U}-2$. $964-202$

SALMSON, 3951 9hp Grand Sporin latest-1ypo underslung body mileago

 RA.C. examination invited, all cars 9.5hp. $55-40$ in.p.g., compulsory 139 Guinca 1950 (Anril) (irand Prix. melal body, largo secering whecl, shock absorbers, one owner; taxed; barbain.
85 fiuineas. Unique 1928 Grand Prix Special streamlinexl Inngetail sports saloon de fuxc, i specin, baflehearing crankshaft, splendid bal-
loonn, fiw., Ifartloris, reully handsome car.

23 (bumens. $1925 \frac{1}{2}$ sports, oh.r., landsnme polighed aluminium body. acuttle ventilators, arco seicens, welt shed, lared.
19 Guineas. 1925 sports, red, black wings, good appearance, runs well. SALMSONS urgentls wanted Vadum Co., 353 ligh IRd., Willerfen
Grecn. N.W.10. Willesden 2469.

SALMSONS. All udier $£ 100$. Sce page 26.
964-65
SALMSON, 1925 sporls, hack and red, new halloon tyres, raked steer-


SALMSON, e20 sporta Zseater, taxed, ready for road: alco Grand Prix 2-ncaler, laxed; exchango . 230 King St., Ifammersmith. Rivarsido
5832.



## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued).

SENECHAL, 1927, Grand Sporta 2 -seater, faxed. chromium-plated, new hood, ncw pacumatic upholatcry, juth ovorhauled, new tyrem, notlight and axtras, any trial. ideal luat sport car at a very low price.
45 guncas. A. Morris. 5 a Nurmaad Rd. Fulbam 2638 . $964-3212$

SINGER. 1929, 8hn Juniur A-scater. excellent condition choice of 3 ,


SINGER. 1931 Tunior sunshino salocin, used 2 wecks only, mileaso 20\%, soo amall for ownor, $x i 35$. Below.
1950 (Mng) Junicr sunshane aloon, blark-cream. milcage moderate, spot ess order Laxed to 193 g 115 . below.

1929 Junior saloon, maroon black, tyres as new, quito faultess, taxed year. $£ 8$ 3̃. Another, taxed June, e78. Helow.
1428 aprith 2.geater, dige whecls, private owner, superb order, 11.000
miles, 253 . Helow.
1928 Junior saloon, blue, leather upholsterg, very full equipment, taxed,
ع58. Below. Smith and IIunter, Ltil., 407 Edaware Rd. Ambassador 1011 Even.
ings 8, Salurday 6 , Sundays 10-1.

SINGER 101926 coachbuift saloon, excecdingly nico condition throughOut, taxed, £35. $516-522$ Stratham 11igh Rd., S.W.16. Phone.
Pollards 4444 .

SINGER 101927 salnon, brown leather and pneuratic upholstery, re panted marmon and black, 4 ncw tsrea, faxed, f47. terms, exchangen. $964-203$
SINGER 1 S24 10hp 2-water and dickey, 3 new Lyrem, good hood and


SINGERS Nownhams always hare on excellent eelection of used SINGERS.
1931 gup concbbuilt aliding-rool saloon, blue, amall mileage only, 2125. 1929 8hp coachbuill anloon, in dual maroon, exceptional order, $£ 68$. 1928 8hp 4 -seater, blue and black, nice candition, $\mathbf{4} 4$.

1926 10-26 coachbuilt saloon, maroon, l.w.b., etc., exceptional ralue,
1927 10-96 4-scater, maroon, one owner and particularly attractio. x32.
Newnbam IIouse, 237 IIammersmith IRd., Londov. W.6. Riv. 4646.126
SINGEA 10 1927, onechango ownership, oxcellert mechanical con-


SINGER. 1927 lohy dn luxo tnurer, ropainted, sood kyreg, bargaing


SINGER, lato 1929 Porlock sports 2 -seater, small mileage, many cxirag


SINGER Tuninr 1929 \& mater, $252 ; 1928$ Singer Thnior 4-scater,


SINGER 1019314 -door coachbuilt sunsbine saloon, wire whecls,


SINGER 1928 Junior 4 -seater, gocrl mechanical condition, nice appear-


SINEER 1929 Porlock, licensed, \&65: eronjogs. Sunnsfeld. Orcheril
Arcoue, Wiokham Rd., Crosdon.
SINGER IOhp late 1926 mourer, new isres and battary, perfect,
 SINGER, 1925 saloon, repainted, nearly new tyres, absolutely perfect


SINGER, 192410 hn Weymann salonn, 1 axed, rery gond tyres and smart




## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (conlinucd).

SINGER. F. G. Smith (Motors). Ltत, 1930 10hp 4-door saloon, chromium filing, Triplex glasi, colour scheme deen maroon and red
 lloo il moct.
urar on
SINGERS. F.O.C.1. Hamnstead. offer smarl 1929 Junior tourcr, ono


SINGER. Truscott for saloon, 1931 Junior roachbuill 4-door baloon,


SINGER. Sce the Naylor and Root bargains on page 24 964-171

SINGER Junior, 1931, 4-door, saloon, brand new condition, colour



SINGERS. All under sce see page 26 .
964-66
SINGER. C37 10s. Junior, lale 1928, 4-sealer, iw bearly new


## singers.

Your Singer is our business.
Fixed repair chargee. Save sou mones. Send for our lise
SINGER 101925 salond, taxed, good tyres, R19.


SINGER Junfor 1930 cnachbuile salcon, 2-tone brown, indistinguishable from wew. milage under 8.000. s95, motorcycles in part: delicrred irme. Broadwas Motors, 19 Woodatock St., Oxford St, W.i. Mavyair
5489 .
964-356

SINGERS. Andrews Automaliles for Singer Juniors and Singer 10s:-
SINGER Junior 8hp. 1928 and 1929 Lourcra and soloons, $\mathbf{C 4 0} 10$ f68: iecd, simplest hire-purchise scheme in existence. Litt of 100 ımall cara frec on request.

SINGER, ${ }^{1931 .} 4$ ppeed. sunshine.ront saloon. Bhy, practically new.





SINGER 1929 salonn, taxed to December 31st. Tery mart throughout,

SINGER 8. £72 10s. Coachbuilt salonn, 1929 model. In exceptional enndition, as new. Bell Motor Mart, Lid., Bath Rd., Cippenham. ncar
Slough. 'Phone, Burnhant 149.456

STANDARD 9. 1930 de luse 4 -deor stion wire whecls, fpotleas con-
 unique deferred erme.
1'ione, Pollards
4444 .

GTANDARD. Newnhams always have an excellent selection of used cara availa
1931 Big 9 fabric saloon, black, with red w.w., 2,000 miles only, 8175.
1930 Shp short-wheelbase sliding-root saloon, dual colours, pertect little
1928 ghp sliding-roof saloon, one owner and very attractire, "x7i.
Newnem Ilourc, 257 Hammersmith Rd., London, W.6. Riv. ${ }_{964}^{464} \mathbf{9 6 5}$

## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued).

STANDARD 9, 1928, 2 -seater and dickey ! w. L. and full equipment.



 Hampstead. One minute llampstead Tube. Plivec. llampsteall 4881. STANDARD 1930 Tcignmouth sunsbine sileon, beantiful orider, repur1929 (September) sunshine saloon. hlack.red, samio owner throusbous,

 STANDARD Big 9, 1931 saloon, first registered February, negligible





 sud tull - 504-142 STANDARD 9 1928 2 seater and ilackey, smal! milemec, excellent


 STANDARD 91930 Tugnmouth Special sunslumat surat year,
 Mall. Enling 4633. 564.73
 1000 (7 linea:

STANDARD. Sec the Naylor and froot bargaius on pare 24. 964-175
STANDARDS. 400 Car List post rrue 1924 en 1931 , How and uqed

 4 Guildford St., Leeds, and at 16 Cambrıdge St., She widd) zzz-399
 STANDARDS. All under $£ 100$. See page 26 . 964-67


 tional condition and aphearance, $\mathcal{E 1 4 6}$. Paul Sawyer an:l Co. 130 G1.
Porlland St. Muscum 1925.

STANDARD 9 1929 Teignmouth labrlc saloon, sliding rouf, black STANDARD. 1929 9hp Futham salonn, brown, one owner only, laxed to


STANDARD 9. Cnriton Garage. Teignmouth, 1930, sunshise, 119


STANDARD 1926 2-seater, new tyres, recently overlazuled at cost of
f25. many extras; exchange, lerms, $£ 25$. Ward nad Co., 5 Unper Richmond Red Púney 2818.
364.444

STANDARD, 1931 morlel Teipomouth sun salnon, black, red upholaters,



STANDARD, 1929 (late) Teignmath sun saloon, maronn fabric, orange Whecle and line almost new condition throughout, succially recommentied.


STANDARD 1930 model 9hp Fullan sun salonn, overhauled and in perfect enndition throughnut ono owner fl11) Best possible deferred terme. The Scrvice Co, 273 High Hulborn. Itollorn 0666. 964-451


## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (conlinued).

Swift. Newnhame, as Swift distributors, almays havo an excellent selecthin of necd cars of this make arailable. Few examples below, but 2951 8hp Caciet fabric staing-roof saloon, black and red, small mileago

nriminew slighly showroum-soiled 10 hp 4 -seater, maroon, one aly,
$£ 165$. $\pm 165$.
Hinnd-new shifhtly showroom-ailed drep-head coupe, one only, $£ 195$. 1931 10hp l’alathn coachluilu sliting roul saloon, hardly soflcd, f 185.
 age. 1 les.
9930 10m, faladin coachlsuilt sliding-rool saloon, maroon, beautitul
comtitum. flis. $193010 h 1$, lruphead crupe, maroon, w.w.. and seseral extras, f138.
19.30 1H1
mendation, $41 \perp 9$. 1929 lohn Palalm coachlouilt aloon, blue, smart and generalls attrac-
the. 210 .
192810 hip thater, tual-brown cellulose, smart and attractive, $£ 46$.
$19 \pm 7$ 10hp 4 -seater, blue, $1 . \mathrm{u}$ b.. new tres, etc., $£ 35$.
1925 trhin 4 -seatcr, blue, fitted 3h. balloons. etc., aice order through-
ollt. £18.
Newnham \|lonse, 237 llammernith Rd. London, W.G. Ris. 4546.12






SWIFT, 10 hin 2 -seater, newly painted, new hood, side screens, mechanically jerfect, ulfer wanled, deon alcer 7 p.m. 96 Dora IRd., Wimbledon. 964 -a75
 SWIFT 10. 19254 -seater tourer, brown leather upholstery, rigid slife


 SWIFT 1930 lohp sun saloon, 4 speeds, enxed. excellent condition, bargun. C138, oxchangoi, delerred. Smith AuLo Co., Ltel., 145
Lowdon Rd., Croydon. Croydon 2182-1648.
$\mathbf{9 6 4 - 2 2 3}$


SWIFT. See tho Ninylor and Root bargains on page 24. 964 -177
 taxed, $P 170$ Rose and Young. Lid., 97 Stratham Milz. Telpphone.
Strcaiham $9520-1$.

SWIFT 19318 ghp Cadec salonu, too small for owner, 2125 . Roso and
Young, Lid., 97 Streatham Hill. Telephone, Streatham $9520-1$. 964 -307 SWIFTS. All under $£ 100$. Sec pago $26 . \quad 964-68$
SWIFT. Andrews Automobiles for Strift bargains.
 existenco. Wirite for list of 100 lighe cara or call.
Andrems Autnmobiles. 37 Shecn Lane, Mortlake (SLation). Thone.
$\begin{aligned} & \text { Richmond } 0576 \text {. }\end{aligned}$ 964-336

 $8155-6$.
 mase, 132.3 Long Acre, W.C. Upen weekeada. Temple Dar 8135.

## SECOND-HAND <br> LIGHT CARS AND CYCLECARS FOR SALE (continued).

SWIFTS. Practically new ears. Denmanz have aereral 1931 and 1930
late morlel \& wift 10 closed or open cars, guarantecd sound, including 1930 fabric 4 - foor saloon, 1930 swallow guarantecd
 (1)

TA1BOT 日, 1923 , 2-seater, sound, fate, economical, f10: Austin 12,


TALBOT, 1 y25 $10-23$ \{ 9 g tax) de luxe 4 -seater. small mileage, inaured


TALBOT 1926 10.23 folding-head coupe, gres, exceptionalls gnod emn-
dıana. laxed. f70. Lecds and Oxley, 459 Edgware Ril. W. 2 . Pad. dington 3843 .

TRIUMPM. Authorized main dealera. Immediate delivery of alf modelt.

TRIUMPM. Sporesmen. Jool: 1 Loak! Look!
 engane slumiluam panelled body, cycle-type winga, single plece screen, salety giasi nneumatic leather upholstery. colnur black and green,
smalcage 5,000 cosi til85; bargain. Morgan Mastings. Lid. 212 New Kings Rul. lopmosite Putier Bridze stationl. Tel.. Putney 7611 zzz-346 TfiUmphs Morgan Ylastings, Led. larges distributors of Triumpn rars, offer the following:-
L155! 1919317 hn de luxe fahric asloon, colour black, with chrominm
bead, mileage 3,000, abolutely an new.〔120:1! 19307 hp de luxe tabric salonn colour duo blue, satety glass £9511! 19297 hp fabric saloon, in exceptional condition througbout.


TRIUMPM. Nicwnhams almays bave an excelleat selection of used cara avalable. Full list on request.
jgeg supmi 7 hp inbrle saloon, blue, fitted satety glass, etc., exceptionaliy
nace conclition, 272.
Brand new but slightly showroom suiled super 7 bp tabric saloon. dual culours. $\mathcal{E} 165$.
Newntarg House, 237 Hammersmith Rd., London, Wi 6. Riv. 4646 . ${ }_{964}$
TRIUMPH Scorpion, tully taxed, maroon, pertect condition, coachbuilt, hinshine roaf, de luxe, mileage $3,000,2190$. Box lo. $2 \overline{348,}$, c.a. The

TRIUMPH 1929 Super 7 , one mwner, splendid candition throurboul,

Trilumph. We bold a large selection of Trinmph 7 models, ranginf



TRIUMPH 1930 Super 7 2-seater de luxe, shop soited, makers usual
 TRIUMPM 1931 fabric galoon de luxe, lax paid. mileage negigible,
\&165. ITatclitio Bros., 200 Ge. Porthad St., W. Musem 8683.118
 gmall milenge, condition as new, 3 months guarant
Bros, 200 Gt. Portland St., W.1. Stuseum 8603.

TRIUMPH Ticklord sunshine saloon. $1930,6.000$ miles very ateractive


TRIUMPH 1930 Super 7 saloon, mechanically exeellent, sny, trial. uniquo
deferred terma. fion. Sl6 522 Sirealham ligh Rd., S. W. 16 . Phone. Pollards 4444 . 964 -80
TRIUMPH A late 1930 de luxe 4-seater magnificent crandition and
complete, barain. flus: exchages or deferred. Cumming 101
 TRIUMPH 19:̃o model Super 7 aloon de luxe, gharanted perfect.
silOO. Below.



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TRIUMPH, 1929 Bhp saloon, frst-clans order $£ 80$ cash, or $£ 20$ down


TRIUMPH. Sec tho Naylor and Root bargaina on pago 24. 964-173
TRIUMPH 7. Bronklands Motor Co. offers 1939 touring car, excep


TRIUMPH super 7 de luxe anloon, hardly soiled, absolutely like new


TRIUMPH, 1929 Gordon England saloon, in unusually good condition thronghous. carctully kised, small mileaze, blue and gres. very smart £90. Below
TRIUMPH Scorpion, 1931. 6-cylinder coachbuilt faloon with sliding

 rond. taxed. insured ond guarnnteed 3 montha, simplest hire-purchase acheme in csis'ance Write for list of 100 light cars, or call.

TRIUMPH 1929 G. Fi soluon, black and red. excellent condition, $\mathrm{f85}$


TRIUMPH suncr 7 2-seater, 1950 , low mileage faxed, one owner choice of two. at $\varepsilon 115$ exchanges nnd deferrel termn


TRIUMPH. Cooke's Motora offer 39307 hp de luxe fabric raloon, cost ovcr $£ 200$, just
Phono $4660-1$.

TRIUMPH, 1929 model Super 7 tourer, maroon, beautiful condition,


TRIUMPH. E110 Suncr 7 tourer, exceptional conditlon, 1930, spot
 TROJANS. Always eceeral in stock. Send for detaile. Lewes Motora WOLSELEY, £15 $1924 \quad 10.5 \mathrm{hp} 2$ scater and dickey, dsnamo lighting,
 King's Rd. (opposite Putney Gridgo Station), S.W.16. Tel., Putney

WOLSELEY Furnet, coachbuill saloon, late 1950, fayed to end of


WOLSELEY Hornet. 1930 /Aggust), sunghine saloon, sliding roof, spring stecring meel, adjustable front beals, Triples geas. gear lock taxed and insured, apote-8 condtion Chisughout and Hernard. 344 Kigg a Rd., Chelsca. Flaxman 4633. 964-97

WOLSELEY 10hp tourer, late 1925 faxed, rew condition, good tgres, 964-a228


WOLSELEY, 23 guineas. 1927 11-22hp 4 -enator, fawn, f.w.b., ver good condition: 100 cars in slock, list irec; exchanges. Open all weck-days, Hampatead. Onc minute Hampatioad Tube. Phonc, Hampatead 4881. $984-192$ WOLSELEYS. All under $\boldsymbol{\propto 1 0 0 . ~ S c o ~ p a g o ~} 26$. 964-69

WOLSELEY, 1930 JIornet, coachbuilt salnon. taxed, excellent condition and anpearance, $£ 1 \approx 7$ 10s. Paul and Co., 114 Gt. Portland St.
Maseum 4117 .
 8135-6.7.

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LEA-FRANCIS, Salmen, Rhode, Talbol, 8.10bp GNi, Irazer. Mash,



SALMSON 10, 1925, 1926. Kirton, IIoniton, Devon.
22z-262
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