

**THE AUTO.**  
Established in 1886.

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**CONTRIBUTIONS**

Articles on automotor technology and touring, or of other interest to motor vehicle users, are invited, especially from overseas

Photographs of beauty, curiosity or other interest are also in request, whether made in the British Isles or elsewhere in the Empire

All contributions should be addressed to The Editor, should bear the name and address of sender, be adequately protected against damage in transit, and accompanied by directed and stamped covering for their return if unsuitable

**SUBSCRIPTIONS**  
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Matter and blocks for insertion in each Thursday's issue should be in the Offices by first post on each Saturday, if proofs required, or on Monday if not. Small corrections can be accepted up to 12 a.m. on Tuesday

**REMITTANCES**

Cheques, Postal Orders, etc., should be made payable to the Proprietors of the "AUTO," and crossed "London County and Westminster Bank, Ltd., Account Payee Only." All communications upon Advertising or Commercial Matters should be addressed to The Manager of the "AUTO."

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**DIARY OF CURRENT AND FORTHCOMING EVENTS**

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

Mar.	....	Motor Exhibition at Amsterdam
Mar. 31	....	Entries close at increased fees for Tourist Trophy Races
Apr. 2	....	Targa Florio Race, Sicily
Apr. 8	....	Midland Light Car Club Rally, Stratford-on-Avon
April 15	....	M.C.C. London—Land's End Trial
April 17	....	Brooklands Easter Meeting
April 29	....	J.C.C. Brooklands Spring Meeting
May	....	Motor Exhibition at Scheveningen
May 13	....	Brooklands May Meeting
May 21	....	Armangue Motor-Cycle Trophy, Catalonia
May 24	....	
June 5	....	International Motor Exhibition, Barcelona
May 30	....	A.C.U. Junior Tourist Trophy Race
June 1	....	A.C.U. Senior Tourist Trophy Race
June 2	....	M.C.C. London—Edinburgh
June 5	....	Brooklands Whitsun Meeting
June 10	....	J.C.C. London—Manchester Trial
June 17	....	Light Car Races, Ballyclare, N. Ireland.
June 20	....	Tourist Trophy Car Race

**EDITORIAL COMMENT.**

**Hill-Climbing Competitions**

The hill-climbing season opened on Saturday last with the Essex Motor Club's fixture, and judging by the large crowd which lined the sides of the hill, the sport has lost none of its attraction. While it is true that the meeting was a popular success, it is open to question whether such functions do very much towards improving the design and construction of motor cars. On paper there were a large number of competitors in the car classes, but actually there were comparatively few, and one saw the same car coming up the hill many times. In one case, a car was entered in fourteen classes.

No fault was to be found with the organisation of the event already mentioned, which was excellent; but if hill-climbs are to remain popular, and, what is more important, useful, the committees of clubs organising them will have to get to work and draw up their programmes a little more definitely than has been the case up till now.

At present it would appear that the policy is simply one of "drift," but we think the time has come for committees to go into the matter and see whether they cannot devise regulations which, besides providing an interesting and instructive, if not entertaining, spectacle, will also do something to improve the "breed" of motor cars.

At the same time we would suggest that committees should endeavour to frame a concise definition for each class, so that an intending entrant can see whether he is eligible or not, and will not be in any doubt as to the possibility of his being disqualified on some more or less technical point after the event. If some little trouble is taken with this work it should do away with quite a deal of unnecessary labour at the hill itself, and also avoid the disputes and dissatisfaction which arise when the classification of the entrants is not thoroughly done.

♦ ♦ ♦

**Aiding Foreign Touring**

In our last issue particulars were given of a new scheme by which members of the Royal Automobile Club and the Automobile Association may take their cars abroad without depositing the full amount of duty required in the various countries to be visited. It may be recalled that some time ago arrangements were made by which all that was necessary in this connection was to deposit a banker's guarantee, but that privilege had to be withdrawn simply because many of those who benefited by the scheme either forgot or ignored the simple precaution of getting their documents signed and stamped when crossing frontiers. Through their carelessness many innocent persons have been put to a good deal of inconvenience.

Both the R.A.C. and the A.A. are to be congratulated on the result of their work on behalf of the motorist who desires to take his car abroad; and now that the facilities have been partially restored, it is to be hoped that those who take advantage of them will scrupulously carry out the simple but essential formalities. In fixing on a round sum of £100 as a cash deposit, the authorities have selected a substantial amount which should ensure most persons taking care to fulfil their obligations.



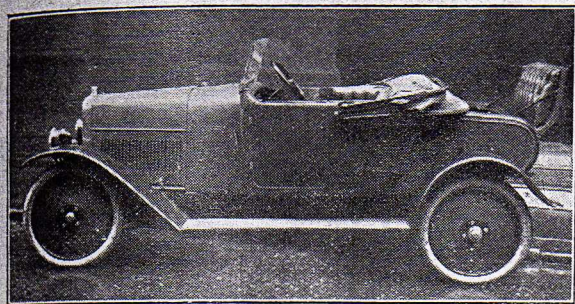


# CARS OF TODAY

## THE 10 H.P. DIATTO

An Italian Car by an Old-Established Firm. Built of British Steel and with British Body

**I**N the Diatto car we have a vehicle in which the main features of Italian design and manufacture are well exemplified, the arrangement of the mechanism and the disposition of the details being in every respect up to the standard which we have learnt to expect from the Latin peninsula. The vehicle has the distinctive advantage of incorporating

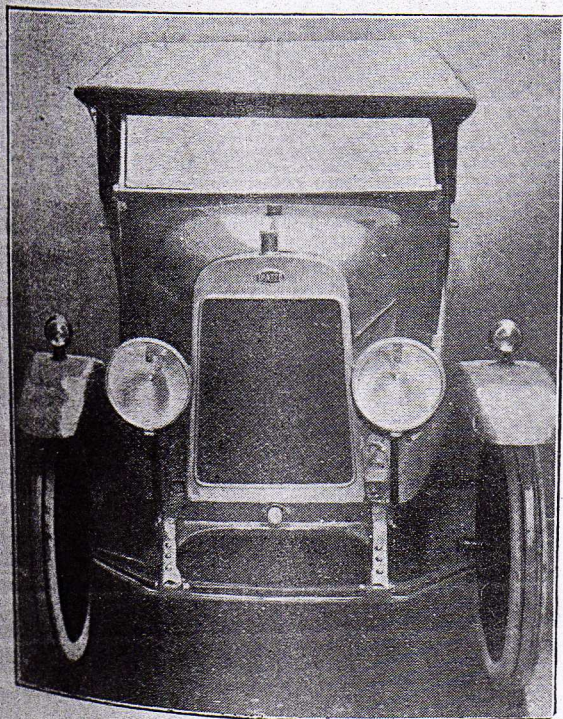


"Auto." (Yellow Cover) Co. right.

A side view of the 10 h.p. Diatto, showing the roomy dickey seat.

in its mechanism steel of British manufacture, which should go a long way in the direction of ensuring for the purchaser that long life which is so desirable a feature in the case of the more moderately powered vehicles.

It is handled in this country by Messrs. Automotive Industries, Ltd., whose works are at Bagshot, Surrey, and who have show-rooms and offices at 25, Heddon Street, Regent Street, London, W. They have, after exhaustive trials and tests, taken up the concession for the new model for the whole of the British Empire, and they have designed some very handsome body-work to suit the particular require-



The 10 h.p. Diatto in front view, showing the fine appearance of the radiator and the neat front axle.

"Auto." (Yellow Cover) Copyright.

ments of the chassis. This coach-work is of the best English manufacture, made here to special designs, and incorporating everything in the way of comfort and convenience and elegance of appearance that the user could desire.

The 10 h.p. model, which forms the subject of our illustrations, is the outcome of many years' experience of automobile manufacture by the Turin firm who are responsible for Diatto cars. They have been building high-class automobiles since 1905, and the sixteen years of effort are reflected in the perfected design of the present model.

No epoch-making departures from what is now recognised as established practice is to be recorded, but the various units of the construction are particularly well arranged, and the general assembly shows a fine appreciation of engineering balance in design and arrangement.

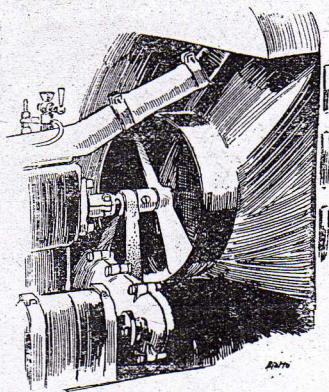
In starting out on the construction of the new 10 h.p. model, the manufacturers have aimed at high-class finish and workmanship rather than mass production, and they point out that an Italian car cannot leave its country of origin unless it possesses three things—good brakes, a good cooling system, and exceptional hill-climbing powers. In getting out the details of a vehicle in which these three cardinal essentials shall be provided the firm appear to us, from our examination of the vehicle, to have been eminently successful; and extended trials and road performances bear out their claims in this respect.

### The Engine.

In the new Diatto, the engine and clutch are mounted as one unit, the gear as a second unit, and the rear axle as the third. Yet all are so interconnected in the design as to

The enclosed fan and air cowl on the Diatto. This view also shows the gear-case for the magneto drive.

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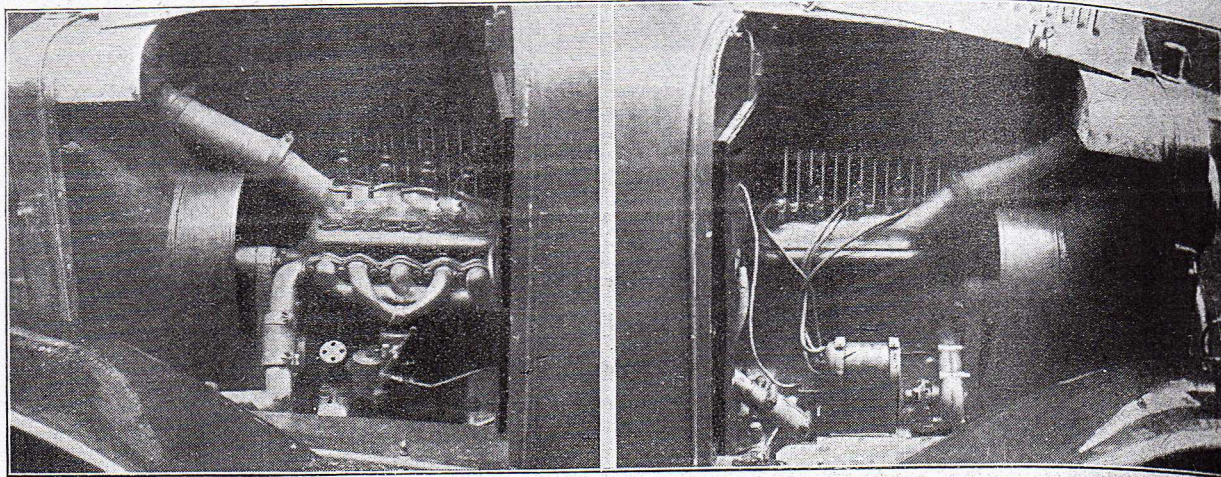
produce the impression of an exceedingly well-combined whole.

The engine and gear are mounted on a tubular sub-frame, which is carried on transverse bearers of U-section steel attached to the deep U-section channel side-members of the chassis. In this way there is ensured that the line of drive from the crankshaft to the gear shall be free from distortion. The engine is of the monobloc type, with all the valves on one side. It has four cylinders, 66 mm. bore, and the piston stroke is 90 mm., giving a cubic capacity of swept volume of 1,017 c.c. The valves gear is entirely enclosed and big valve caps fitted.

The crankshaft is of particularly rigid construction, and specially balanced for high speeds. It runs in three very large bearings, and the lubrication is forced by a pump in the crank-case which delivers the oil to the main bearings at a pressure of about 30 lbs. to the sq. in. This oil is forced through the bearing and through the shaft journal, and thence by oil leads drilled in the crank cheeks to the big end bearings. The same pressure feed sends the oil to the camshaft bearings. The gudgeon pins, the pistons and the cam surfaces are lubricated by the oil mist sent up from the crank-case. In order to give the maximum speed, the oscillating and reciprocating parts are made as light as possible, and all are very carefully balanced. The connecting rods and pistons are drilled in order to reduce the weight.

The cooling system is thermo-syphonic, the large pipes connecting the jacket with the radiator being clearly shown in our near-side view of the engine. But in addition

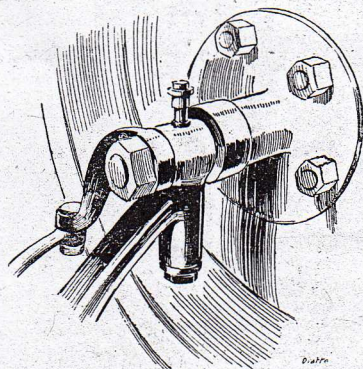




A near and an off-side view of the engine of the Diatto, showing the air scoop and fan tunnel behind the radiator. On the left is shown the inlet and exhaust manifolding and the arrangement of the Zenith carburettor. On the right is seen the distribution gear-case and the adjustable drive for the magneto.

to the water circulation system there is a very well-designed cowl which encloses the back of the radiator and terminates rearwardly in a fan housing in which the two-bladed wooden propeller fan rotates, being driven by a flat belt from the pulley on the engine crankshaft.

By this arrangement it is ensured that all the air displaced by the fan is drawn past the radiator cooling surfaces, and is then directed, by virtue of the shape of the cowl, directly



The neat steering-head on the Diatto, showing the flange attachment for the disc steel wheels.

"Auto." Copyright

along the line of the cylinder jacket. In this way efficient cooling is insured even under the heaviest conditions as to full throttle and load and low car speed, and the makers claim that their unique experience of the car in mountainous continental countries has enabled them to apply a cooling system reliable under all conditions.

The carburettor is the Zenith automatic of the vertical type, and feeds the inlet valves through the V-shaped manifold which straddles the exhaust manifold as shown in our view on the near side of the engine.

The carburettor is controlled by a pedal. The minimum setting (for slow running) is effected by rotating the mushroom head of the pedal, the required adjustment being then locked automatically by a spring pressed-steel ball which falls into a recess and prevents the mushroom head turning accidentally through side-pressure of the driver's foot.

In our view of the off side of the engine will be seen the Mirelli high-tension magneto, which is driven by gearing running in oil and contained in the forward engine distribution gear-case. It has an adjustable coupling which is quite silent in operation, and, as will be seen, is placed in a particularly accessible position.

Another feature of the engine which may be commented upon is the arrangement of the big water head outlet, which is held down to the water joint with the cylinder head by the four hollow set screws into which screw the four compression taps leading directly into the centre of the cylinder head combustion space. The sparking plugs are screwed into the valve caps, and are also in an accessible position on the near side of the cylinder block and immediately above the four inlet valves.

Petrol is fed by gravity from a tank in the scuttle dash having a capacity of five gallons.

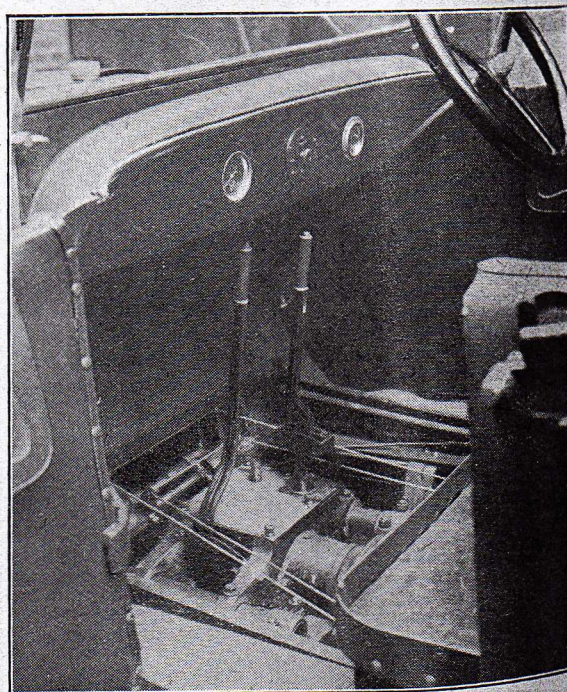
The clutch is of the dry plate type, the plates being

normally kept in position by a series of springs, the tension of which may be adjusted from the outside without in any way dismantling the clutch or the clutch operating gear.

The gear-box, as we have mentioned, is carried on the same tubular sub-frame which carries the engine, keeping all in line, and the power from the clutch to the gear is transmitted by a small detachable shaft articulated so as to ensure that no wringing strains are set up either in the clutch withdraw motion or the primary shaft of the gear.

A feature of this arrangement, which is important and adds considerably to the efficiency of the transmission of the engine power to the rear axle, is that the whole of the tubular sub-frame which carries the engine, clutch and gear is inclined to such an angle relatively to the chassis frame that at normal loading the transmission line is direct, and no work comes on the single big universal joint at the forward end of the propeller shaft other than that directly due to the rise and fall of the back axle as the wheels encounter the irregularities of the road surface.

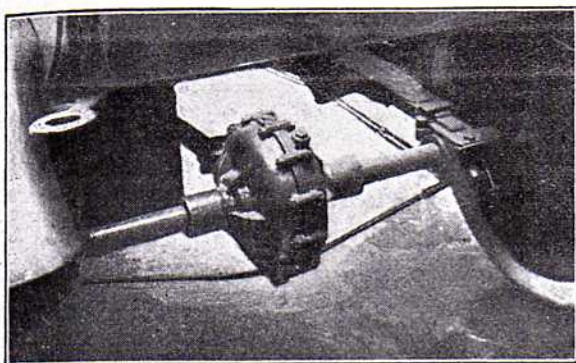
The gear-box provides for three forward speeds and reverse,



An under-scuttle view of the Diatto, in which is seen the suspension of the gear-box unit and the compensating arrangements for the brake cable gear to brake pedal and hand levers.



and the sliding members for the change of gear are controlled by a central change lever operating in a gate above the gear-box, and seen in our view of the dash portion of the car with the floor boards removed.



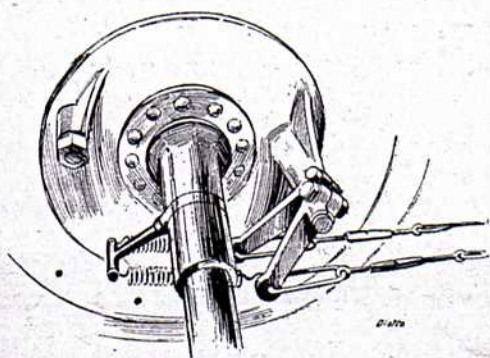
"Auto." (Yellow Cover) Copyright

A view of the Diatto rear live axle, which shows how the ends of the quarter-elliptical springs are anchored to the axle. This view also shows the neat differential casing.

The whole of the gears are readily exposed for examination by the removal of the big cover which spans the whole of the top of the gear-box, and can be readily removed by undoing the four corner milled nuts. The top gear ratio is 4.46 to 1.

At the rear of the gear-box is the spherical anchorage of the propeller tube, which acts as a torque member as well as enclosing the propeller shaft, and inside this casing there is neatly disposed, as indicated in our drawing, the drive for the flexible speedometer shaft, the outer casing of which is seen secured to the joint housing by a union coupling. Here also will be seen the grease lubricator for the lubrication of the end rotating member of the speedometer drive gear.

As we have indicated, the power is transmitted to the rear axle by the enclosed propeller shaft inside the torque tube. The rear axle differential casing is a bronze casting, and the rear axle is of the full floating type, in which the driving shafts each side of the differential gear are relieved of all loads except the torque of the power transmission. The bevel drive and the differential gear are fitted with substantial double ball thrust bearings, and also are supported on large-sized journal ball bearings. The driving thrust on the car from the axle is taken by the ends of the quarter-elliptical springs through large bronze bearings which encircle the axle tube. These are fitted with big greasers, and the detail is discernible, as far as the off-side spring is concerned, in our rear view of the car, where the neat live axle and differential case is also shown. It will be seen that the ends of the



"Auto." (Yellow Cover) Copyright

The brake-operating levers on the Diatto rear hubs. The take-off springs for the two levers will be noticed; also the wire stretcher sleeves for taking up the adjustment.

springs are strapped and bolted down to the spring seat on the oscillating bearing which surrounds the rear axle tube.

In this view will also be seen the lubricant filler for the differential, the greasers for the spring plate and the tie-rod which strengthens the back axle construction.

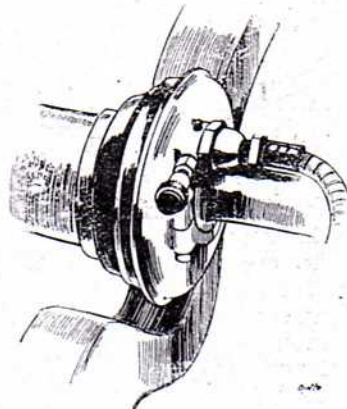
The front axle, as is indicated in our front view of the car, is of exceptionally neat design, and the steering heads are of

somewhat unconventional arrangement. This detail is shown separately in our sketch of the end of the axle, the steering head and the wheel hub, where it will be seen that the car is suspended from the stub axle. This view also shows the steering arm arrangement. The front springs are of the semi-elliptic type.

The steering is by an irreversible worm and wheel. The complete worm wheel is arranged so that four wearing positions are available and can be brought into operation as the necessity for taking up wear arises. The wheels are of the detachable disc type, and are secured to the hubs by four quickly-removable cap nuts and an outside flange. All the wheels are on big ball bearings, which in the case of the rear pair are mounted on the axle casing, the drive shafts being independent of the wheel bearing and capable of being removed endways from the axle assembly.

The universal joint and torque-propeller tube anchorage of the Diatto transmission, showing the neat arrangement of the speedometer drive.

"Auto." Copyright

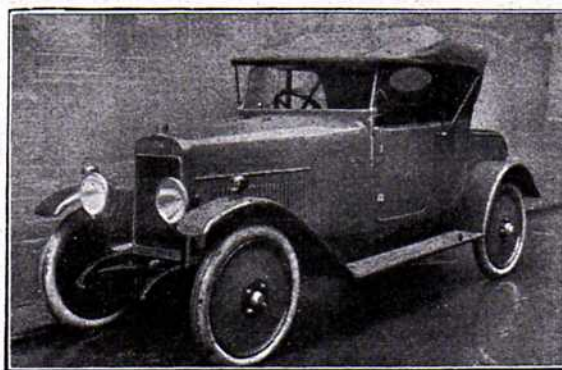


The brakes are of the internal expanding type in the drums on the rear wheel hubs. Both foot and hand brakes are independent, and they are operated by cables with right and left hand screwed tensioning sleeves.

All the brakes are compensated by the wire cables which run through levers and hollow shafts.

The wheel-base of the car is 8 ft. 2 ins., and the track 3 ft. 7 ins., and the chassis weight is 8½ cwt.

The Westinghouse two-unit starting and lighting system is installed, the dynamo being located in front of the engine on the off side, and driven by a V-belt from the pulley on the end of the crankshaft. The starter is geared to the flywheel by a self-engaging pinion drive. Five lamps are included in the equipment, and five wheels and four tyres. The chassis price is £350, and the very handsome and well-equipped two-seater which we illustrate is sold at £425, with a Grahame-White standard body which has been specially designed for the chassis. It is most comfortably upholstered, and has a dickey-seat in which the seating and back rest and leg-room are ample and the accommodation very roomy. An adjustable screen and a roomy hood complete the car, and give ample protection when driving. The whole vehicle has a most pleasing appearance, largely due to the fine lines of the body design. The petrol consumption of the car works out at 45 miles to the gallon, and the tax is £9. An all weather model, with double screen and side drop windows in the doors, is also provided, and a four-seater torpedo, also a sporting type model.



"Auto." (Yellow Cover) Copyright

The 10 h.p. Diatto with hood extended.



ragged, as the use of the expression "stage-management" might quite understandably have suggested. What was in my mind was the fact that in events of this kind just as much depends on competitors as on starters and marshals, and unless the competitors are perfectly ready, and alert, no amount of pre-start organisation can be effective. I think Mr. Bradley handled an onerous job most creditably, and I take the greater pleasure in saying so because that gentleman is personally unknown to me—a fact which of itself should exculpate me from any suspicion of having spoken, or written, "cattily."

Mr. Léon Cushman, also, I gather is not pleased because I scolded him and his team-mate. He says

that if I could do better I should myself have driven in the race. Perfectly, *mon cher, brave Léon!* But it was only the fact that I knew I could *not* do nearly so well as you which kept me out. I was annoyed with you because although, in your excellent book on the Bugatti, you tell me, and other Bug. fans, not to meddle with the car, but to get the best of it as Bugattis build it, *you* tried to "improve upon nature" with your carburation, and it was just this naughtiness which robbed you of twenty precious minutes. Your son would never have been so unwise, and I think that you must in future confer with Pierre before you indulge in this kind of nonsense!

## THE ITALIAN GRAND PRIX RACE

THE organisers of the new track at Monza Park, near Milan, are not being favoured with the best of luck. For the Grand Prix race for 2-litre cars on Sunday, out of the 39 cars which

galli and Maserati. The Austro-Daimler team did not start owing to the fatal accident to one of their drivers (Kuhn) when practising on the previous day.

The cars were set to cover eighty laps of the ten kilometre course, and the first round saw the elimination of one of the Fiats: Giaccone letting in his clutch too suddenly and breaking a cardan joint. It was soon apparent that the two-litre Fiats were the fastest cars on the course, and Bordino took the lead. At the end of five laps, he was 2½ mins. in front of his team-mate Nazzaro, who was being chased by Maserati on one of the Diattos. These two cars were quite fast, but in the twenty-ninth round, Maserati's car skidded into some sand bags, at a corner of the course, and overturned, the driver and his assistant fortunately escaping with nothing worse than a shaking. The two German cars did not stay very long, Stahl leaving after 100 kiloms., while Heim abandoned at 175 kiloms., and both of them had encountered quite a lot of trouble. The second Diatto continued until it had covered 520 kiloms., when it retired. The race continued without further incident to the end, Bordino finishing the 800 kiloms. in 5 hrs. 43 mins. 13 secs., his average speed being just a shade under 87 m.p.h. Nazzaro finished in 5 hrs. 51 mins. 35 secs., and then the crowd, in its excitement, got on to the course, and Viscaya on the Bugatti, who still had a few laps to go was compelled to pull up. This was very unfortunate, as, in spite of plug and tyre trouble, de Viscaya had run a very sporting race and well-deserved the third place.

The Fiat cars taking part in the race had six-cylinder engines with a bore and stroke of 65 X 100 mm. The valves are inclined in the head and are operated directly by two overhead camshafts, these camshafts being driven by a vertical shaft and bevel gearing from the crankshaft. One of the most noticeable features in the Fiat engine is the use of special roller bearings practically throughout the engine. The crankshaft is supported by eight of these, while a similar type of bearing is used for the connecting rod ends and for the camshaft. Ignition is provided by a single magneto. A Fiat carburettor is employed, being specially designed for rapid acceleration.

The drive is taken from the engine, through a multiple disc clutch to a four-speed and reverse gear-box, the control lever for which is situated in the centre between the driver and the mechanic. Brakes are fitted to the front and rear wheels, and are operated through the medium of a Servo-mechanism, which enables the pressure on the brake shoes to be applied gradually. These cars have a track of 47 ins., a wheel-base of 98 ins., and weigh approximately 1,450 lbs. empty.



Pietro Bordino at the wheel of the 2-litre Fiat on which he won the Italian Grand Prix race for 2-litre cars on Sunday last at Monza.

were entered only eight started in the pouring rain, which, as on the previous Sunday, spoiled the racing. The starters were three Fiats, driven by Bordino, Felice Nazzaro and Giaccone, a Bugatti with de Viscaya at the wheel, two Heims, driven by Heim and Stahl and two Diattos, piloted by Mere-

For some time past the police, and particularly the Metropolitan police, have been very active in taking proceedings against the drivers of cars on which the number plates are not easily distinguishable. The police contend that the number plates should be fixed in such a position so as not to get splashed with mud in wet weather, and there have been many convictions where front number plates by being placed on the front axle have unavoidably become dirty. In order to obviate the difficulty a number plate has been designed consisting of aluminium letters and numbers which are attached to a piece of wire mesh. This can be placed on the front of the radiator, and does not affect the cooling of the engine to the same extent as a solid plate would. The

Metropolitan police, however, have contended that such a plate does not comply with the regulations, because the letters are not on a solid plate, and proceedings were recently taken against the driver of a car with such a front number plate, before the Wimbledon Bench. The case was defended by the Legal Department of the R.A.C., and the magistrates dismissed the summons, because in their view the spirit of the regulations was not infringed.

The Southend police have issued a warning to char-a-banc owners and passengers of their intention to enforce the new bye-law prohibiting the blowing of horns or other noisy instruments, loud singing or bawling.



# "AUTO." ROAD-TRIALS

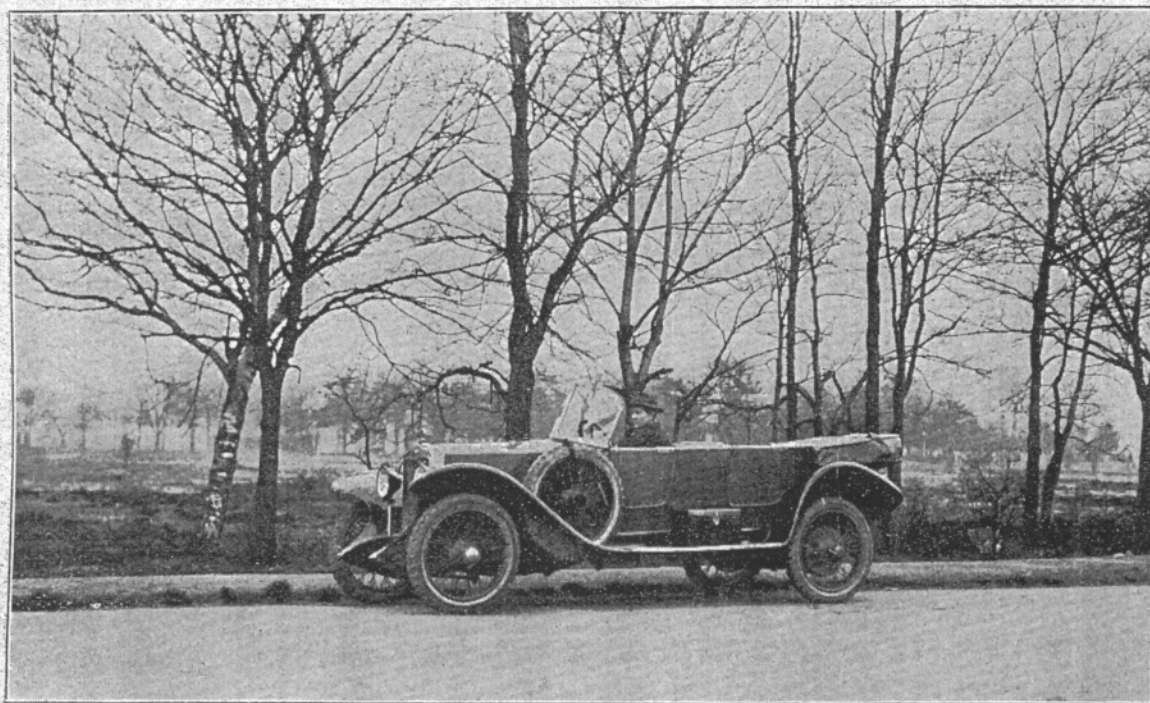
BY A. B. C.

## VII.—THE 15.9 H.P. DIATTO

**B**Y its manufacturers, the Diatto Automobile Company of Turin, this car is designated the 1923 two-litre Model 20. It has a four-cylindrical motor of extremely advanced design, with a bore of 79.7 and a stroke of 100 mm., the bore being clipped by 0.3 mm. to bring it within the 2,000 c.c. category. Founded in 1905, the Diatto Company manufactured fairly largely up to War-time, and during hostilities their two factories—one in the Via Fréjus, Turin, and the other at Madonna di Campagna, in the environs of that famous city—made very material contributions to the equipment of the Allied forces, so that the Armistice found them possessed of considerable manufacturing resources. The troublous times through which Italy passed between the end of 1918 and that of 1922, however, prevented their getting down to production on anything like the anticipated scale, and although Diatto cars put up some very fine performances during the competition season of 1922, their producers have only quite recently felt able to appoint Capt. Cyril Durlacher, A.M.I.A.E., of 6, Upper St. Martin's Lane, London, W.C. 2, to represent them in the matter of selecting agents and dealing with enquiries couched in English. Durlacher is rather an exceptional Italian scholar for an Englishman, having put in several years in Italy, before and during the War.

The two-litre Diatto's valve-gear is of the overhead type, neatly encased above a monobloc cylinder casting, very much on Bugatti lines, or those which for convenience I will so characterise; in fact, the chassis as a whole is marked very much by lines of thought similar to those of the famous Molsheim

constructor. The motor has a three-bearing crank-shaft, of course, tubular connecting-rods and pistons of an aluminium alloy which certainly requires more than ferrous clearance, but seems to warm-up very rapidly. A Zenith triple-diffuser carburettor is fitted, and the whole of the electrical equipment is by Robert Bosch, of Stuttgart. Fuel-feed is by pressure, engine-lubrication by a submerged gear-type pump, and water-circulation by a centrifugal pump, assisted by a true honeycomb radiator of what to English eyes are extravagant proportions—so much so that the car which I tried had nearly one-half its cooling area blanked off, to keep things pleasantly warm. Engine, clutch-encasement and gear-box are bolted together. The frame is more or less conventional, and the suspension is by half-elliptics forwardly, with long and efficient full-cantilevers aft. Four forward speeds are available, the different combinations being engaged by a centrally-placed lever, alongside which is the contracting transmission-brake lever. The pedal-applied brakes expand inside drums on the rear hubs. Transmission is by a single-jointed cardan shaft enclosed by a torque-tube, with final drive of the spiral-bevel order. Steering is by worm and full wheel, with ball-and-socket connections between the main lever and the swivels. There is good provision for trouble-free inspection, adjustment and lubrication everywhere, and everything about the chassis is very nicely finished. At current exchange the touring model illustrated can be retailed, completely equipped, at £650, therefore the price, for a car of such quality, is very moderate. One must remember, however, that this price is subject to exchange-fluctuation, so that, although deliveries are prompt at the moment,



A speedy two-litre car from Italy—the 15.9 h.p. Diatto, mentioned in the notes above.



the Diatto is a car to try and buy early, if one wishes to take advantage of the present relationship of *lire* and pounds sterling.

I have never regretted the Brooklands close season more than I did on the occasion of this trial, because the Diatto is fitted with a kilometre-reading speed-indicator which is very ambitiously engraven as to its dial, and the stretches near London on which one can get going at even 75 m.p.h. are both few and brief. We found one, of course, and it was very pleasant to feel the Diatto hurtling through the crisp air for even half a mile, with the needle hard down on the "120." At that speed the car is delightful, tried in either the driver's or the rear seat. The engine has a distinctly aeromotor roar, the cut-out certainly cuts-out the silencer all right; but a smoother running engine at high speeds I have not met. It seems as good as that of the three-litre Bentley, and at least on this trials car there would appear to be very little between the T.T.-model (or high-compression) Bentley and the Diatto, in the way of speed, despite the disparity of cylinder-capacity. When the track is reopened I should like very much to see a little ten-lap match between these two cars, representing Italy and England, at something very near their best.

The engine will run down to a flywheel-speed which gives a road-wheel pace of about 15 miles per hour on fourth speed. I do not suggest that greater flexibility is not attainable, but the Zenith fitted on this particular car obviously wanted tuning. The operation of the gears makes itself heard, certainly. The dry-running single-plate clutch is very good, though that of this car was inclined to rotate a little longer than one liked; but with a little care, in default of skill, one could get about the gate without tears. The ratio of the fourth speed struck me as a little high, in relation to the third, but this was clearly a matter of the width of the gap between the two rather than that the fourth is too high. A slightly higher third would put matters quite right. Engine-control is effected by three levers mounted in the boss of the steering-wheel (the third being for the regulation of the diffusers, of course).

The Diatto's brakes are very good indeed. They had need be, on such a car. The steering is excellent, although I did not satisfy myself as to its behaviour in fast cornering. I do not like driving rapidly in urban or even suburban areas, and so left to Capt. Durlacher the major part of the demonstration of the car's free-running speed, contenting myself with investigating its other merits, of which there are enough to satisfy a judge of my ability. I should be inclined to wonder if the rear springs are not apt to prove a thought too active on a badly cambered corner; but anything more restfully reassuring than their work on medium-to-bad surfaces, going straight ahead, I do not want, nor do I expect to meet it.

The chassis, tyred and with reservoirs filled, weighs just on 2,000 lbs. The body-work fitted (which was designed and built in the Diatto works, like aught else of the car barring the Rudge wheels, tyres, Bosch equipment and carburettor) is substantial, roomy and highly intelligent in design and dimensioning. Here, in fact, was another instance of what can be done by body-designers who are also motorists, because although Durlacher is a distinctly leggy young man, and I am not, I was perfectly comfortable at the wheel, except that I found the transmission-brake lever quite as far from me as I wished it to be. I

am more than ever convinced that central change has decided demerits, notwithstanding its adoption by British houses like Rolls-Royce, Ltd. On every other count I would gladly have swapped my present car for a Diatto of this model, and I admit that my own stunted growth had much to do with a slight inconvenience of use of the hand-applied brake, which happens to be that on which I habitually rely when I find myself having recourse to brakes at all. In all other respects, however, the Diatto "two-litre" is a very comfortable as well as a very fine motor-car.

The acceleration is splendid, and although the carburettor fitted could be made, as it was tuned, to spit a little until the engine was nicely warmed-up, one could open-out fearlessly later, with no suspicion or apprehension of flattings. Admittedly this engine must be used intelligently, as regards its ignition; but it is capable of much more *even* fourth-speed slow running than is my own, and although the car has an overall length of about 13 ft. 9 ins., at a guess (her wheel-base being a full 10 ft.), she has such liberal steering lock that one can wangle her about in Town traffic quite pleasantly. One gets one's satisfaction out of the relatively low third-speed ratio climbing to the Hog's Back, or up Hindhead. It is really a magnificent third for heavy collar-work, although one must always expect to find this capability in a model which came into being in the neighbourhood of Turin.

At low flywheel-speeds the engine's operation can be heard, especially during the first 10 miles. Let there be no mistake about that. But when once the oil is warmed-up, and one can get the fourth home, and settle down in the forties, a sweeter-running motor it would be difficult to imagine, because the assorted sounds then blend into one harmonious whole, and that whole the musical, dynamo-like hum which means that everything is very happy, well-mated and content. It is not fair to suggest that the Diatto has to be running at 40 or over to be a nice car. What I mean, rather, is that it is even a nicer car at from 40 upward than between a standstill and 40, and we must remember that this is a racing-bred engine, in the chassis of what my insistent young friends, Messrs. Carleton and Mundy, of the booming Bentley, would call "a fast touring car." Anybody who buys a two-litre Diatto for loafing around Hyde Park, or tooting down to the Post Office, is a fool for his pains. It is a man's motor-car, designed and built for straight-away driving. As that it is a very signal production, and at its current price of £650 (import-duty paid, of course), with five 820-120 mm. tyres and full equipment, it is a very low-priced man's motor-car.

Four bodies are standardised—that illustrated, a less racy-looking open five-seater, a coupé-landaulet seating four inside, and a six or seven-seated saloon; but the sporting five-seater is by far the most attractive example of Diatto coach-building, in my eyes, even if I were an enthusiast in the matter of enclosed or enclosable body-work, which happens not to be the case.

People who have almost despaired of finding an electrical engine-starter which does its job from ice-cold, and does it without an infernal din, want to try that on the Diatto. People who appreciate a nice, clean, oil-splash-less motor, and a really handsome treatment of detail such as the cast aluminium dash proper, want to inspect the Diatto. People, also, who want to see what sort of body-work engineers



(who would be pained to be called body-builders) can turn out, when given their heads, want to examine this sporting five-seater, whose hood connects-up with the screen very cunningly when wanted, but is encased in a leathern envelope, absolutely dust-tight and noiseless, when idle. To outdo my own record in the matter of tact, no German or Austrian car embodies more little brain-waves in the matter of body-work and equipment than does this Diatto. That is saying a great deal, because although some of the ex-enemy creations are anything but elegant, as wholes, nobody who has examined them will deny that the German or Austrian *carrossier* is a highly ingenious designer, and a very thorough handicraftsman into the bargain.

I found only one weak spot—the beautiful mahogany panelling of the rear of the front seat. Certainly it is carpeted up as high as decent people ever flap their feet about, but I think that it is rather asking for trouble to put beautifully-grained and superbly-polished hardwood where shoe-soles can imaginably reach its surface, and it is quite clear that some of Capt. Durlacher's passengers have been no friends of what is still called French polishing. Except, however, for the opulence of this outcropping of cabinet-making, and the fitting of highly ornate oxydised

silver handles on the two little cupboards fitted at the ends of the instrument-board, the Diatto bodywork is as sensible in treatment as it is ingenious in conception. Even in a matter like the mudguards, I have never seen wings so moderate-looking in area which protected the body so thoroughly as did those of this car.

Things like the adjustment of any wear on the steering, the regulation of either of the braking systems, the tool-storage, the treatment of all the wiring, and so forth, are singularly well handled, and either to examine the two-litre Diatto at rest, or to taste its quality while the needle is forging steadily around that fascinating tale of kilometres, is to realise that if Italy got "nasty," and determined on a policy of dumping, she would be able to make things highly distasteful from the standpoint of the British manufacturer of motor-cars—if, that is, this very wonderful £650-worth is any criterion as to what one can buy in, or import from, Italy today.

#### "AUTO." ROAD-TRIALS.

CARS, tests of which have been previously recorded in this series, with the dates of issues in which they were discussed, are as follow:—

Bentley 15.9 h.p., Jan. 11.	Lagonda 11.9 h.p., Feb. 1.
Crouch 12-24 h.p., Jan. 18.	Maxwell 21 h.p., Jan. 25.
Deemster 11.9 h.p., Feb. 8.	Rolls-Royce 20 h.p., Jan. 4.

## THE 12 H.P. B.S.A. CAR.

A Six-Cylindered Sleeve-Valve Model which Presents Many Desirable Features.  
A Well-Protected All-Weather Vehicle

**T**HE 12 h.p. B.S.A. car is a vehicle which incorporates the wonderful technical skill and manufacturing resources of the Daimler and B.S.A. companies, and its principal feature is, perhaps, the inclusion in the design of the now famous Knight sleeve-valve engine, which, in this case, is one of six cylinders and a monobloc construction, and one unit (engine, clutch and gears) power plant.

In the design of the B.S.A. we have incorporated something of the old B.S.A. practice, and much of that which has dominated the Daimler works for so many years. Thus, in the arrangement of the power plant in the chassis, we have the sloping engine, which allows of the under-geared worm-driven back axle and yet so arranged that the line of power transmission shafts shall be coincident right through engine clutch, gear and propeller-shaft when the vehicle is normally loaded.

The chassis of this vehicle presents a very excellent

example of keeping down the weight without departing from those principles of construction which a very extended experience has proved so successful. Thus the chassis weight is only 12½ cwt., which is remarkably light when one considers first an engine of 59 by 94 with six cylinders, and secondly a wheel-base of no less than 9 ft. 3 ins.

The engine, as we have mentioned, is the silent Knight sleeve-valve as developed so remarkably in the Daimler works. It conforms to the original Daimler design, with a few minor developments and improvements. It is a feature of this engine that the spherical combustion chambers, to which the sleeve valve arrangement so particularly lends itself, has been found to produce effects on the gases and their mixture and disposition which entirely prevent any tendency to the now somewhat common defect of "pinking."

The six cylinders are monobloc, and the crankshaft runs on seven large bearings. The Daimler system of adjustable trough lubrication is adopted, and this, combined with the

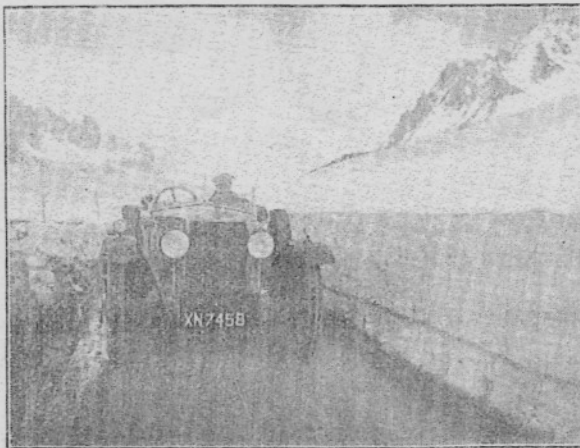


An off-side view of the chassis of the 12 h.p. six-cylindered B.S.A. car. The many-leaved quarter-elliptic springing will be noticed, and the up-curving of the rear of the long chassis frame.



and provides one of the finest sights to be seen from the road anywhere among the Alps. It may be recalled that this mountain was the last of the Swiss summits to be scaled by man. Briancon lies off the road at the foot of a steep hill, and it is not necessary to go down to it unless one wishes so to do. The route now goes through La Vachette, where there is a French custom-house, just beyond which will be noticed a tall obelisk reminding travellers that the finely engineered road of the present day is largely due to its reconstruction at the instigation of Napoleon

in 1802, although the pass itself has been in use certainly from Roman days, and it is pretty generally accepted that Hannibal made use of it for his famous incursion into the Romans' country. A kilometre on, and the car is in Italy, with wonderfully extensive views continually being unfolded for nearly all the way to Cesanne, with its red-roofed houses, at the foot of the valley. Here the Mont Genevre road may be left for what is termed the Col de Sestrieres, another little bit of highway work carried out by Napoleon. This road, however, necessitates some stiff climbing, and it will probably be found much more interesting to take the cross-road, although it is exceedingly undulating, which links Cesanne to Susa, where the Mont Cenis pass road can be joined. In Susa there are some important Roman remains, including a monument to Augustus, which is claimed to date back to when Anno Domini was only seven, and on the run down to Turin there will be seen many little characteristic Italian villages, each presenting a charming picture to the eye.



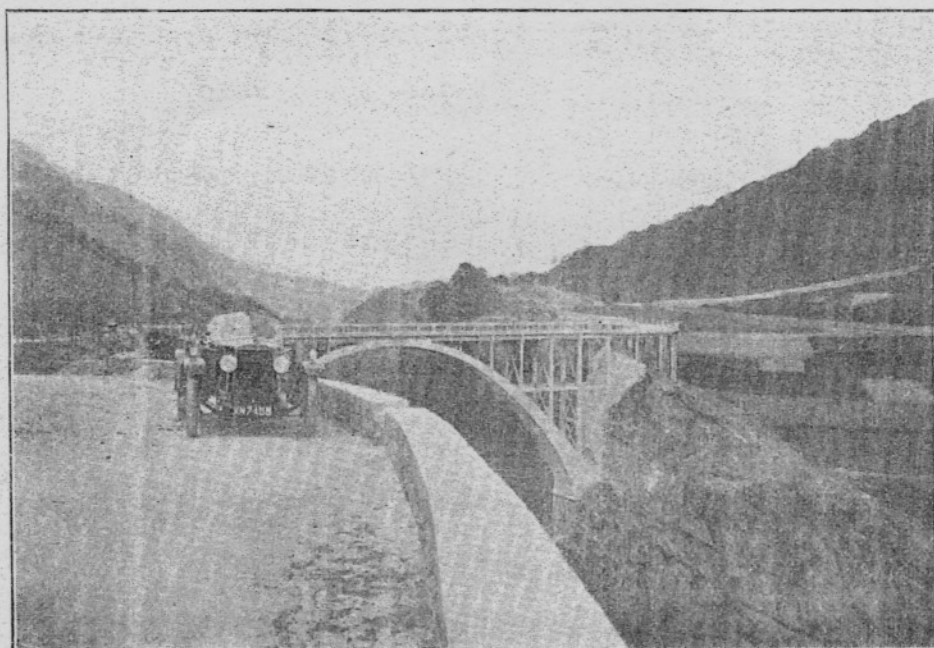
The depth of the snow in the Col di Lanteret on Whit Monday can be gauged by the two-litre Diatto standing on the road.

Beyond the fact that it produces some of the finest motor-cars in the world, I do not think that Turin has much to interest the tourist. It is proud of being one of the cleanest and healthiest towns in Italy, and if one is really enthusiastic the various motor works are well worth visiting, especially the huge Fiat factory, with its unique testing track on the roof.

The tourist will doubtless prefer to go on, and make his headquarters in the valley of Aosta, either at Aosta itself or at St. Vincent. At both places good hotel accommodation

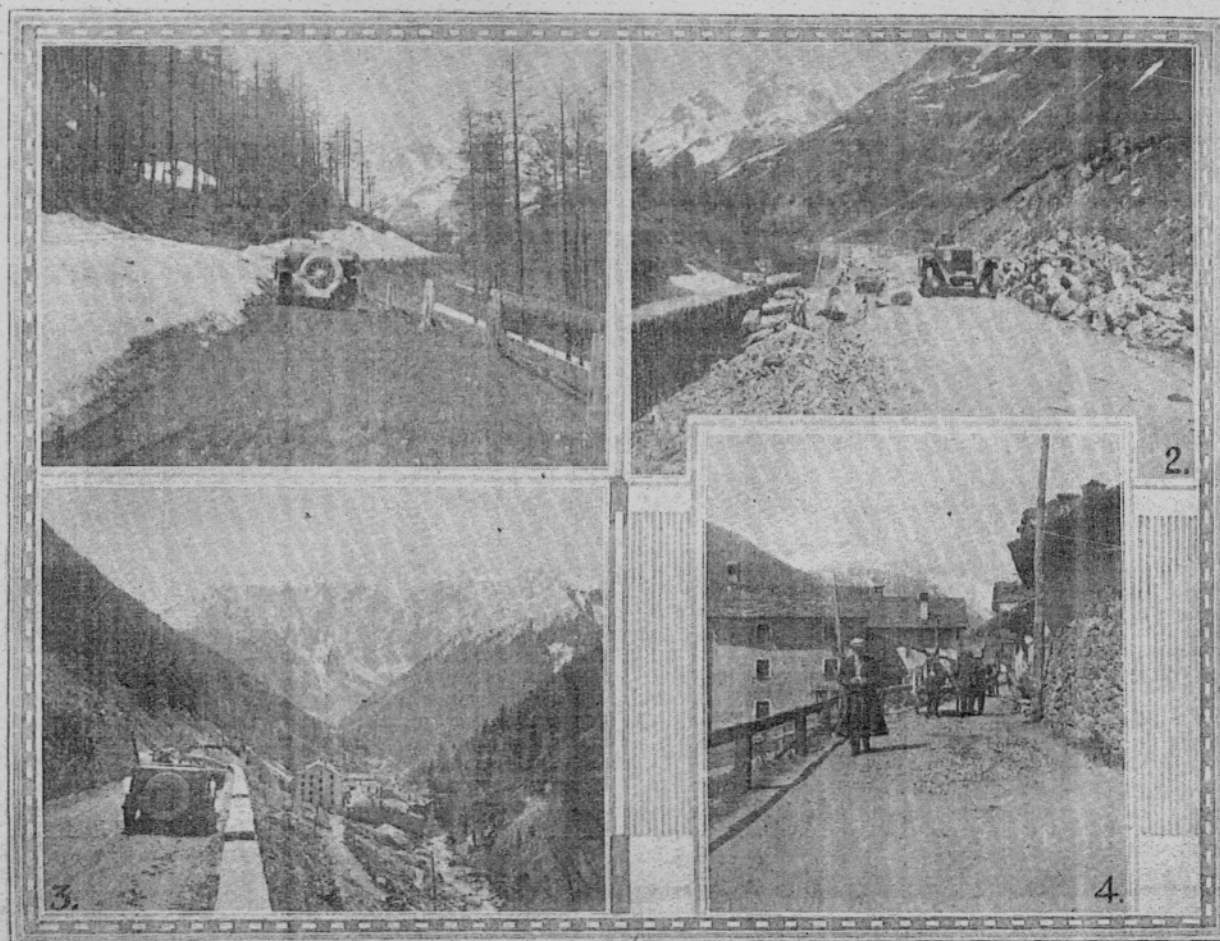
is to be had, and to those who have had any experience of the Italian lake district the charges will appear to be very reasonable. Especially is this true of St. Vincent, a popular resort of the native holiday-makers, who cannot afford to pay the fancy prices which are the rule in places to which the foreign visitors flock.

As I have already indicated, the valley of Aosta is one of the most renowned in Europe; it is over sixty miles long, and some of the most commanding peaks and awe-inspiring glaciers of the Western Alps are to be seen along it. The motorist who arranges to spend a week there will find plenty to employ his time, for, apart from the many interesting sights in the Val d'Aosta itself, there are at least half a dozen subsidiary valleys open to motorists, each of which will well repay the spending of a day in exploring them. Comfortable hotels will be found at the head of each of the valleys, where good food and accommodation can be obtained. During the season, from June to September, these hotels are well patronised



In the Stretta d'Exilles between Susa and Cesanne, a typical example of Italian mountain engineering, especially the new ferro-concrete bridge.





AMONG THE ITALIAN ALPS: 1. On the Great St. Bernard pass, 3 kilometres above S. Rheme, further progress of the two-litre Diatto being barred by the snow on Whit Sunday. 2. The same road a little lower down, with the damage from the flooded river being set right. 3. Another view of the pass, depicting the magnificent panorama along the valley. 4. A typical village on the Great St. Bernard pass, showing the narrowness of the road.

by Italians, and it is possible that sleeping accommodation might not always be available in every one of them. It is for that reason that I have suggested that the better plan would be to make either Aosta or St. Vincent the headquarters for the week. Each of the valleys would make an easy day's tour, so that there would be no difficulty in returning to the same hotel each night. The principal centres for tourists are: Gressoney, Valtournanche, Cogne, Courmayeur and Champoluc, the major and minor St. Bernard passes, while the surroundings of Mont Rosa, Mont Blanc and the Gran Paradiso offer the most outstanding panoramas of natural beauty. From Courmayeur, which is famous for its iron and sulphur waters, as well as for being a good centre for mountaineering excursions, a magnificent view can be obtained of the Mont Blanc glaciers, and half an hour's walking from the hotel brings one practically to the foot of them.

In addition to the beautiful views which are so lavishly displayed by nature, the valley of Aosta is rich in Roman and mediaeval monuments and remains, many of them being quite well preserved. The town of Aosta possesses a good deal that is of considerable archaeological interest, and still takes pride in the walls, which are said to date from the time of Augustus. The name of the place is in fact derived from Augustus, who,

impressed by its strategic position at the junction of the Great and Little St. Bernard passes, founded a military colony there in 25 B.C. The triumphal arch (which is shown in the heading to this article) under which one passes on entering the town is also associated with the famous Roman emperor, and it is said to have been erected in his honour about 23 B.C. It is in a wonderful state of preservation, although a slate roof, put up in 1716, at the instigation of the city council, to protect the memorial from water infiltration, will be thought by many not to add to its dignity. Other ancient remains are of the double praetorian gate, and the remnants of a theatre, amphitheatre and bridge. Coming to more modern times, there is the cathedral, a great deal of which goes back to the fourteenth century, the church of Sant Orso, some of which is 200 years' old, and the prior's house, dating to 1490. Aosta has a historic link with England, as it was in this place that St. Anselm was born, and from which he came to win by his uprightness and fearlessness the favour of King Rufus and the English people, and to gain eventually the see of Canterbury, although his occupancy of St. Augustine's chair was a stormy one.

At Verres there is an old castle, erected in the thirteenth century, which is one of the finest feudal monuments in the valley. It is open to the public, but application to go over it must be made at the