## THE ROVER MOTOR CAR.

In our reports of the trials of small motor cars recently leld by the Automobile Club, reference was made to the

the pedal is pushed forward and the levers Q-of which there are three—pull back the disc P which carries the levers, and forces O into driving contact with N.

one reverse, namely, eight, sixteen, and twenty-four miles per mesh with L1 and only comes into driving action when the

and Z is slid along its shaft from the neutral position between the slow forward speed and the reverse speed into a small wheel behind L, which is continually rotating on an idle The gearing is designed to give three speeds forward and fixed shaft not shown in the figure. This wheel is always in vehicle which has been constructed by the Rover Cycle hour and eight on the reverse. The top speed is obtained slow speed wheel Z is moved into gear with it. The

changing of the gears is effected in a novel manner through the medium of a tube arranged concentrically with the steering stem, and connected to a lever situated under the steering wheel.

From the illustrations it will be seen that the engine A, the clutch box B, gear box C, propeller shaft casing and exhaust box D, together with the aluminium casting E, form one solid whole. The front axle is a steel tube, the end jaws being brazed into it. The steering levers are situated at the rear of the axle, and are connected together by means of a cross rod, but the steering is effected by means of a double cable, which is rotated about the spindle at the bottom of the steering stem by means of the steering wheel. The connections between the cable and the ends of the levers which actuate the wheel spindles are made through the medium of a spring, the spring being so adjusted that only one of the cables is taut, the second being slack and acting as a reserve.

The front end of the car is carried by means of a horizontal bolt resting on a bracket on the transverse plate spring Y, supported on the front axle. The body is supported at the rear on two longitudinal springs, which are separately fixed by means of a single bolt in brackets carried at the outer ends of the rear axle case, the front end of the body being hinged to a swivel bar E1, which is in turn secured to the bracket carrying the swivel pin before mentioned. The frame of the car is chiefly an aluminium casting, and the body is designed to carry two persons. The splash system of lubrication is adopted for the engine, and the lubricant for the clutch, gears, and

vided, and has one or two novel points. The circulation of the water through the cylinder jacket is effected by a

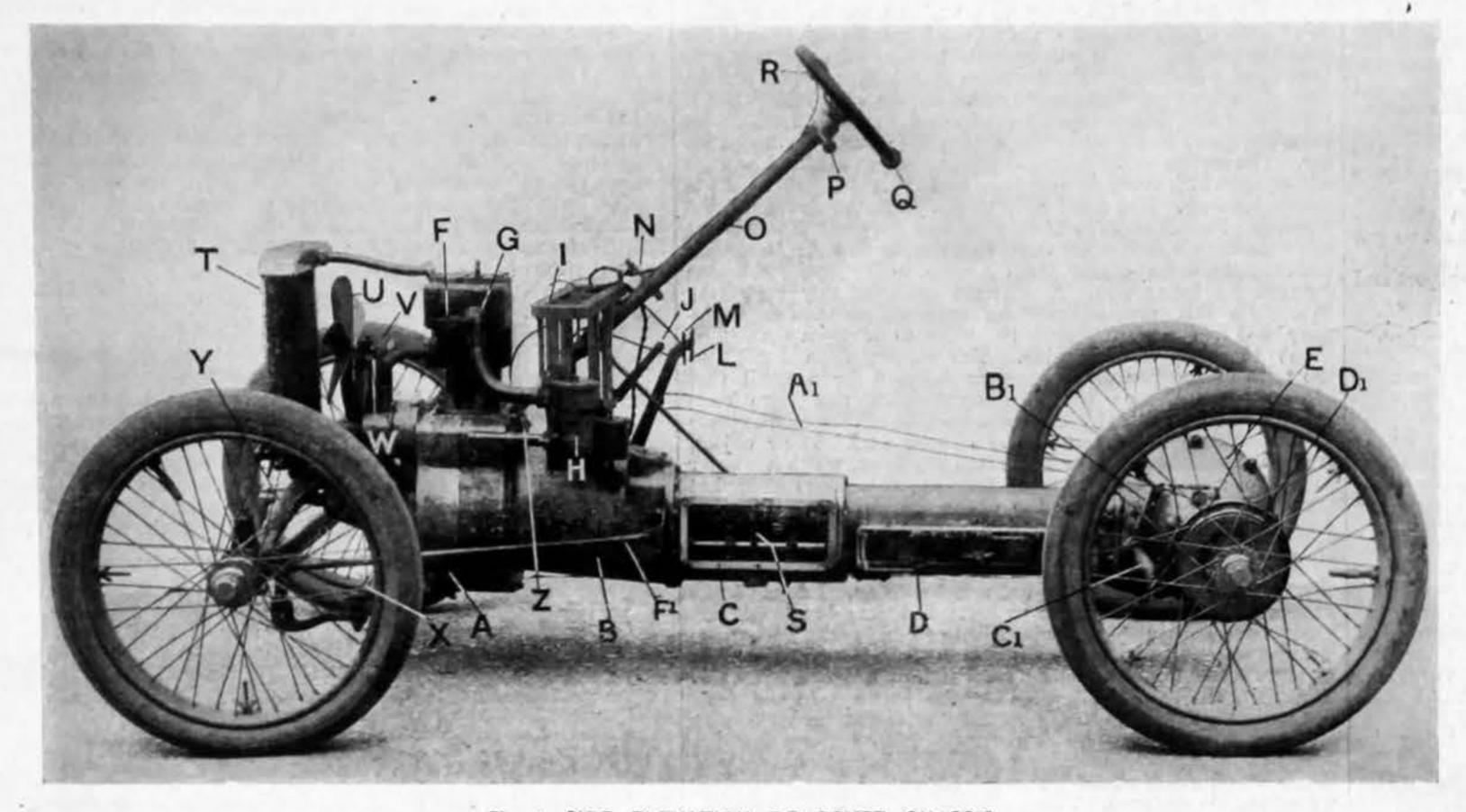


Fig. 1-SIDE ELEVATION OF ROVER CHASSIS

Company, Limited, Coventry, from the designs of Mr. E. by means of a direct drive right through from the clutch rear axle is inserted through inspection covers. An W. Lewis. We are now enabled to place before our readers shaft to the rear bevel wheel, which is secured to the electrical system of ignition with accumulators is proseveral illustrations showing the novel form of construction differential case, and is situated in the aluminium casting adopted. Figs. 1 and 2 show an elevation and plan of E. As will be seen from Fig. 3, for the low speed the wheel

through the crank chamber, clutch, and gear boxes. The engine is of the vertical singlecylinder water-cooled pattern with mechanicallyoperated exhaust and inlet valves. The cylinder is 41in. diameter by 5in. stroke, and it is claimed that 8 brake horse-power can be developed at a speed of 900 revolutions, while the engine is capable of acceleration up to 1500 revolutions. The crank is made from a solid steel forging, internal fly-wheels being bolted to the cheeks of the cranks. The weight of the fly-wheels is 120 lb., or about one-eighth of that of the car when in running order. The bearings of the crank and crank shaft run on large size balls, and a pinion on the crank shaft drives a spur wheel which in turn gives motion to a gear wheel keyed on the halftime shaft. The latter is provided with a set of cams, which by an endwise movement, communicated by means of a foot lever, affect the operation of the exhaust and inlet valves. For instance, when it is desired to reduce the speed of the engine, pressure on the foot lever causes the cams to reduce the lift of the inlet and exhaust valves, while a further depression causes the cams to close the valves altogether, and the engine acts only as an air compressor, thus forming a highly effective brake. Power is transmitted to

the main driving shaft  $G_1$  through the medium of a countershaft  $N_1$  to the wheel  $E_1$ , thence to Z and the shaft should this become deranged the water will still continue specially constructed clutch  $N_1$ ,  $O_2$ ,  $O_3$ ,  $O_4$ ,  $O_4$ ,  $O_5$ ,  $O_4$ ,  $O_5$ ,  $O_6$ ,  $O_6$ ,  $O_6$ ,  $O_7$ ,  $O_8$ , is made in the form of a floating cast iron disc O, having a centre boss with a square hole, the power speed, the motion is transmitted in the same manner

the chassis, and Fig. 3 represents a sectional elevation X meshes with C1 and transmits the motion through the special form of pump with a two-bladed propeller, but

CONTACT MAKER D

Fig. 3.—SECTIONAL ELEVATION OF CRANK CHAMBER, CLUTCH, AND GEAR CASES

through a connection to the end of H1. For the second being transmitted from the crank shaft D through between the two constant wheels X and C1, and along the as shown. In addition to the engine brake, powerful band

the water jacket is rendered easy by the provision of an aluminium cover bolted on top of the combustion chamber

brakes are also provided on the rear wheels, the brakes being of wrought iron working on malleable iron drums. At the rear of the engine is a vertical cast aluminium bracket I-Figs. 1 and 2—bolted to the clutch case B. This forms a stand for the petrol tank, and carries the electric battery and the carburetter H and various other attachments.

In the trials alluded to above the car was constructed to accommodate two persons, but it was apparent that there was sufficient power in reserve to enable at least three persons to be carried with ease.

Hi

Fig. 2-VIEW ON TOP OF THE CHASSIS

ended shaft G, to the first gear wheel X, which carries and thence to the propeller shaft. For the top speed, the the jaws A1, and also carries a bearing for the shaft jaw clutches B1, fitted to the gear wheel Y, mesh with the H1. The clutch foot lever operates the lever R, and draws jaws A, on the small wheel X, thus giving a direct through back the sleeve V against the action of the spring W, when drive. The reverse is obtained when the sleeve carrying Y

the casting N to the plate O, and through the square- shaft N1, through the two wheels D1 and Y and the shaft H1,

THE INSTITUTE OF SANITARY ENGINEERS .- The following meetings of this Institute have been arranged: -October 10th, Organising Committee at 3 o'clock, Examination and Literary Committee at 5 o'clock; October 15th, visit to the Liernur system of sewerage at Stanstead, train leaving Liverpool-street at 1.23 p.m.; October 19th, Election Committee at 3 o'clock, General Purposes and Finance Committee at 5 o'clock. The Institute also announces a course of lectures in Practical Sanitary Science, to take place between this time and February next. The course will consist of twenty lectures. The various lectures to be given will be by well-known professional men, and will be illustrated with diagrams, drawings, models, and lantern slides. The lectures are intended to cover the whole of the subjects scheduled by the different bodies who hold examinations in sanitary science, and will deal with mechanical physics, hydraulies and hydrostatics, building construction, plumbers' work, sewerage, sewage disposal, water supply, meteorology, ventilation, heating and hot-water supply, lighting, scavenging and disposal of refuse, &c. Visits to sanitary works of interest are being arranged in connection with the lectures. The reference library is open free to

students attending the course. The loan of books from the library can be obtained on payment of 1d. per volume per week. The fee for the course will be 15s. Application for admission should be made as early as possible to Mr. Arthur E. Ashby, secretary, 19, Bloomsbury-square, W.C., from whom further particulars may also be obtained.