

I must confess that as an independent person, with some knowledge of the way in which records are sometimes made, I had been tempted to regard with a certain amount of suspicion—probably unfounded—the accounts of similar performances when made by interested persons or employees of the firms concerned; but when I tell you that this achievement was in no way premeditated, that the car was in no way specially prepared or geared for it, and that indeed it only occurred to me to make the attempt after I had been some miles on my journey, you will realise that it constitutes a very genuine vindication of all you have ever claimed for the flexibility of your six-cylinder engine. In order that there may be no misunderstandings, let me tell you exactly what I did.

On leaving Hilston I put the car into its top gear and drove through to Exeter where I lunched, the car was again started on its top gear and driven to Taunton, where I slept the night. In the morning I again started on the top gear and drove through to your office in New Burlington street, the latter part of the way through fog and darkness and all the miseries of the Brentford and Hammersmith traffic.

The first and second speeds were never used throughout the whole journey of three hundred miles. On two occasions, however, when I encountered traffic in the middle of a hill and had to stop, I ran the car back by gravity to the level, started again on the top gear, and proceeded on my journey. On two other occasions when I took a wrong turning, I ran the car back on the reverse to the point of divergence, starting again in both cases on the top gear. On only two hills did I find it necessary to keep the engine running by shifting the clutch. And as a proof that the car was not geared low or specially prepared, I ought to add that it carried two passengers, four heavy pieces of luggage, and covered a flying mile on a very favourable piece of road in 50 sec. My other exploits on this journey included threading my way on the top gear through a narrow and hilly street of Bath, and of turning right round in the main street of Taunton where I had taken a wrong turning.

Although I think there are other good cars besides the Napier, I honestly do not know of any other car capable of running at a speed of over sixty miles an hour on which this journey could be made on the top gear throughout."

## Rough Motoring.

### FROM AUCKLAND TO PALMERSTON NORTH.

Mr. W. L. Luxford, of Hamilton, who accompanied the contestants in the recent reliability run from Auckland to Wellington as referee, has just made the journey south by way of the west coast. It was an experience.

Leaving Auckland before the floods had fully subsided, he found that the run to Hamilton, eighty miles, occupied the whole day, instead of the usual five hours. In many places wash-outs had to be crossed with the greatest care. The Razorback Hills were washed out in channels, and the surface was much like a stony river bed. As he descended

into the lower country, along the Waikato river, the roads were in many places covered with water, slush, and debris, for many chains at a stretch. In one portion of the water-covered road a culvert had been washed out. Into this invisible ditch the motor car plunged; but it managed to wriggle through. The stench from the recently flooded country was anything but pleasant. The very bad roads ended at Taupiri, and a pleasant run was made to Hamilton.

The second day's run was commenced at 4 a.m. There were good roads to Otirohanga, forty miles, which was reached at 7 o'clock. A great feature of this part of the journey was the number of rabbits on the road about Ohaupo and Te Awamutu. They were in thousands, and the car ran over several. From Otirohanga to Te Kuiti (fourteen miles) a road has lately been formed, but the motorists were told that for ten miles it was blocked by slips, and was quite impassable. Nothing daunted, they decided to try an old Maori track over two swamps and some five miles of fern ridges.

At each of the swamps the "emergency gear"—wire rope and block and tackle—had to be used to haul the car through. But by dint of hard work Te Kuiti was reached at noon. Hitherto the road followed the Main Trunk railway; but at Te Kuiti it left civilisation and went west to Awakino (fifty miles) on the coast, four miles north of Mokau. Leaving Te Kuiti at 12 15 p.m. fairly good roads favoured the motorists for about fifteen miles. The country is of a limestone formation is very hilly, but in places shows good grass. The remaining thirty-five miles of road is only fit for bullock-dray traffic. It is formed, but neglected. For miles as one ascended some of the hills, the sensation in the car was similar to that of going up a long flight of steps. Then for a few miles a variation would be met with in the shape of loose flags of limestone, some a foot thick, lying at every conceivable angle, and forming wedge shaped holes in which every now and then the wheels would get jammed.

The country here is a succession of razor back ridges covered with very poor bush, some of which has been cleared and is carrying sheep. The mustering of these sheep must evidently be carried out by a special kind of man and special kind of dog; for it seems an impossible feat for ordinary mortals. But to return to our motorists. After being so shaken that every bone in their bodies ached, they reached Awakino at 6 p.m., and thoroughly enjoyed the accommodation provided at the boarding house at the mouth of the river. The one redeeming feature of the road from Te Kuiti to Awakino is the varied and grand scenery which meets the view, and if the roads were put in order for summer traffic it would be a favourite route for tourists.

The third day's run was to New Plymouth (60 miles). There heavy rain compelled a rest. The road from Awakino to Mokau has lately been formed inland, doing away with the heavy sandy beach. The Mokau river is crossed in a punt, and very good unmetalled roads over hilly country, with magnificent views and occasional glimpses of the ocean, brought the travellers to Urenui. Thence to New Plymouth they found splendid metalled roads through well settled farming country—and one 2s. 6d. toll-gate. The fourth day's journey was made against a strong head-wind to Palmerston,

through country that is too well known to need description.

Mr. Luxford is of opinion that with a comparatively small expenditure on the roads, the journey from Palmerston to Auckland could easily be accomplished, without any unreasonable speed, in three days, and would be preferable to the Napier route, where an altitude of 2800ft. is crossed several times. On the West Coast route the highest reading of his aneroid showed only 1200ft.

## Two-Cycle v. Four-Cycle Oil Engines.

By H. C. CHRISTIAN, CHRISTCHURCH.

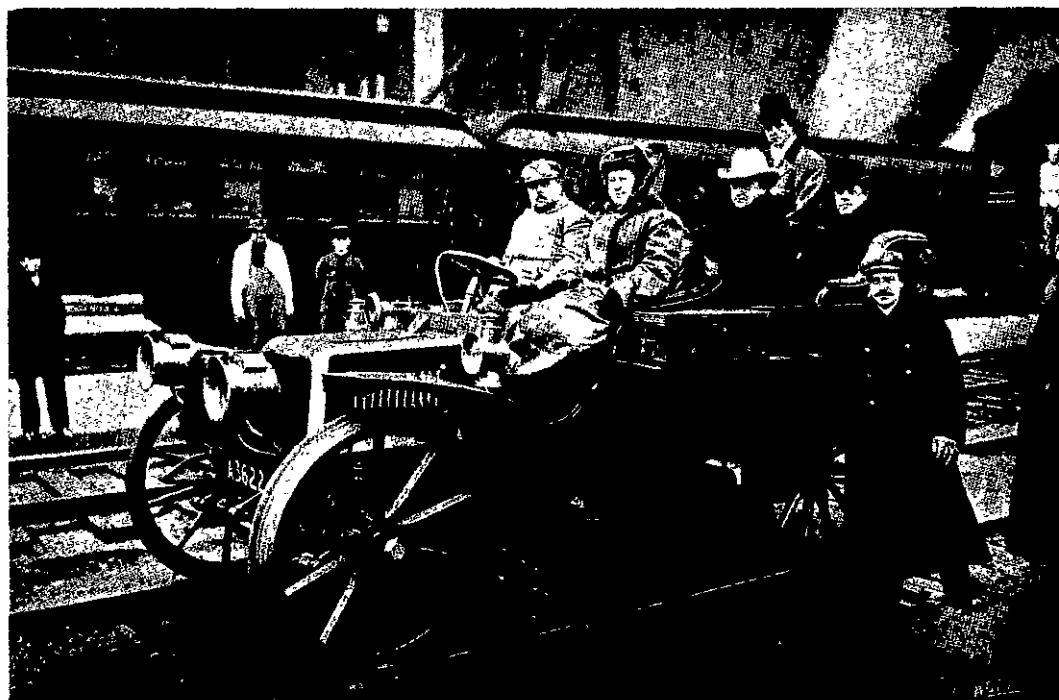
A two-cycle engine (sometimes called a single-cycle engine) is an engine which gives its charge in one cylinder at every revolution, and which usually makes charge in the crank chamber. I say usually, as these are engines made with separate compression chambers, although this is not the rule. This class of engine is often recommended by its makers on account of its even motion and also on its capability of being built lighter per h.p. than a four-cycle engine. It is a very simple engine, being practically valveless. Its arrangement is practically this: a charge of oil and air is admitted into the crank chamber of the engine by the suction of the upstroke of the plunger being drawn through the vaporiser en route, which mixes to a gas. On the down stroke the charge is compound, and at the bottom of the down stroke a port is opened into the cylinder by the passing of the plunger, and the charge is admitted to the cylinder, where on the return stroke it is compressed and fixed in the usual way, either by flame, hot tube or electric spark. The charge exploding expands and drives the plunger down and it again uncovers a port on the opposite side when the exhaust gas escapes. With this arrangement it will be noticed that at one position of the plunger both the inlet and exhaust ports are open at the same time, the new charge being prevented from shooting into the exhaust by a vertical shelf on the piston head which directs the charge into the top of the cylinder.

This arrangement, although very simple, has notwithstanding, some very bad points. For instance, the crank chamber must be practically pressure tight before a satisfactory charge of gas can be made, which is very difficult as the bearings begin to wear. Then again, when a plunger is passing open ports they must assuredly cut away to some extent, and form uneven surfaces in the cylinder, with the inevitable result of losing compression in which is confined the power of the engine. Then engines, if well made, will sometimes last from five to six years; but beyond that are worn out. It is, however, only the best of them that have a life as long as this. Numbers of the cheaper class have never lasted out twelve months ordinary use. It is, therefore, a risky matter to buy a cheap oil engine, especially a two-cycle.

We now turn to the two-cycle engine with separate compression chamber. This is an infinitely superior type of engine, but is naturally more complicated than the ordinary two-cycle engine. With this engine a much higher compression can be obtained, which means greater power. The movement of these engines can be made much more rapid, as the suction stroke is practically done away with, and the charge of gas is admitted direct to the cylinder head. They have, however, so far not been accepted for general use, being confined almost entirely to motor cycles, cars, etc. It must be clearly understood that the first thing required in an oil engine of any description is a proper quantity and quality of gas to explode, and to have it admitted quickly at the correct time; it is also very important that the charge shall be fired at the right time, which varies according to the speed of the engine. For instance, an engine travelling at say 200 r. p. m. should fix its charge just as the plunger reaches the top of the stroke, but in an engine travelling at 500 r. p. m. a considerable amount of lead should be allowed for. This is to counteract the speed of the plunger, and is regulated so that the explosion comes on to the plunger just as it is beginning to descend.

The greatest fault, however, of the two-cycle engine is its oil consumption. It is practically impossible to obtain the same amount of economy out of a two-cycle engine, power for power and type for type as out of a four-cycle one, owing largely to the fact that the surplus amount of power over and above the necessary power required to drive the engine in a two-cycle is very small. This is due largely to the small compression and the limited amount of time possible for the charge of gas to set into the cylinder, and thereby leaving a narrow margin of efficiency.

Now we will go on to the four-cycle, or Otto type, engine. This is an engine which, firstly, on the down stroke of the engine draws in a charge of gas through the intake or compression valve, and, secondly, on the return stroke compresses it, and at the end of the compression stroke fires it, which thirdly drives down the plunger as the gas expands,



A MOTOR CAR ON RAILS: MR. CHARLES J. GLIDDEN STARTING ON HIS UNLUCKY MEXICAN TOUR.