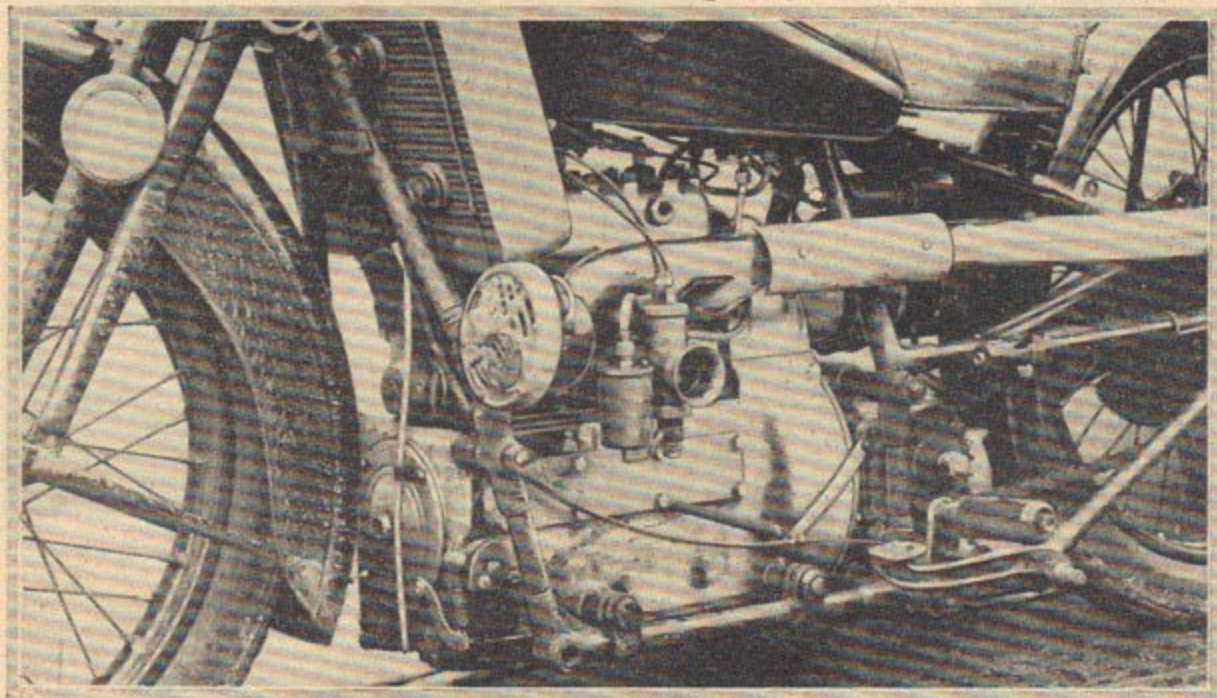


A Three-cylinder Unit-

New Water-cooled Three-in-line Scott with Four-speed Gear and Many Novel Features, to be Marketed in Two Sizes: "The Motor Cycle" Tests the First Sample



The near side of the unit, showing its sturdy mountings in the duplex cradle frame. Note, too, the position of the single carburetter immediately beneath the exhaust ports

A MOTOR cycle with the torque of a six-cylinder, with unit-construction, a four-speed gear, water-cooling, and an ultra-low centre of gravity—this is the intriguing specification of an entirely new Scott that is shortly to be placed on the market. It will be made in two sizes, namely, 747 c.c. and 987 c.c., and the first machine, a 747 c.c. model, is at present in *The Motor Cycle* test stable.

The engine is a two-stroke with three cylinders and the cranks set at 120 degrees. As has been pointed out before in these columns, this arrangement offers several advantages, the most important of which are the excellent balance and the short overall length. Although in the accompanying photographs the machine looks to be unusually long, this is largely an impression created by the low build of the mount as a whole, the wheelbase being but 59in.; the saddle height is the low one of 26in.

A monobloc casting is employed for the three cylinders. This is of Chromalium cast-iron and is arranged with three ports per cylinder, in accordance with

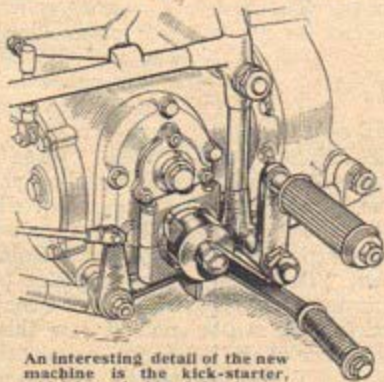
the usual practice. The ports, however, are both machined and polished to ensure the maximum efficiency. A patented divided cylinder skirt liner is fitted, and oil is led in at eight points around each liner; it is said that not only do these

liners allow a direct feed to the little-end bearings and positive lubrication of the pistons, but they also permit accurate timing of the inlet ports.

Split-skirt pistons of heat-treated light alloy are employed; these carry three rings, pegged, of course, to prevent rotation, and, as is customary in Scott designs, the skirts have a number of small grooves arranged with the object of assisting the lubrication.

For the cylinder head a single light-alloy casting—of Hiduminium—is used. This has an eighteen-stud fixing and spherico-conical combustion heads with the sparking plugs arranged centrally. Accuracy in the matter of combustion-chamber volume is ensured by reason of each head being machined; they are also polished.

The lower half of the engine is particularly interesting. The crank chamber is of box formation and therefore immensely rigid. It is constructed of Elekron and contains an oil sump of approximately one gallon capacity. Since the engine is of the crank-case-compression type, the



An interesting detail of the new machine is the kick-starter, which is so designed that it may be used as a non-stand

construction Two-stroke

crank chamber is, of course, divided up to form three separate crank cases. This is accomplished in a most ingenious manner, which can be readily understood from the illustration of the built-up crankshaft on the next page.

As will be seen, there are three circular light-alloy discs of a diameter slightly greater than that of the flywheels. These, together with a fourth at the front end which is not shown, form the walls of the crank cases and are mounted in a tunnel in the main crank-case casting. In addition, they form the main-bearing assemblies, each containing a double-row roller bearing.

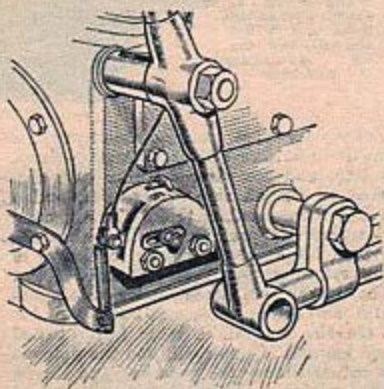
A novel feature of these crank case "walls" is that they are cored so that oil or water may be passed through them for cooling purposes in the event of the engine being used for almost continuous full-throttle work, as in long-distance racing. The effect, of course, would be to cool both the bearings and the crank case. This last point is important as regards the volumetric efficiency.

Gas-sealing

Equally interesting is the means whereby the individual crank cases are made compression-tight. This is accomplished by oil-flooding the main bearings, which act as oil distributors, and maintaining the oil at a pressure higher than that attained by the mixture in the crank cases. Special races, which have only a running clearance between the outer and inner members, are employed. The rollers, incidentally, are $\frac{3}{16}$ in. \times $\frac{1}{16}$ in. and the crankshaft is mounted in no fewer than eight separate bearings—two in each crank-case "wall."

Roller bearings are also fitted to the big ends of the H-section light-alloy connecting rods. Since the crankshaft is of the built-up type there is no difficulty over the use of solid-race bearings. These are carried in a split big-end eye, which grips the solid outer race, and are lubricated under pressure.

A single Amal carburettor, mounted on



The regulator of the throttle-controlled oil-pump

the near side of the engine, feeds the three crank cases by way of a flush-fitting aluminium manifold, which is located close to the exhaust ports, from which it abstracts a certain amount of heat for pre-heating purposes. The transfer ports are, of course, arranged on the opposite side of the unit.

The lubrication system is as unusual as it is clever. There are two pumps—a small rotary pump and a variable-angle swash-plate pump. The two are interconnected, and the latter throttle-controlled. The rotary pump draws oil from the sump and delivers it to (1) the other pump and (2) the various auxiliary drives, such as the dynamo, oil pump and ignition distributor drives. In this latter case the oil drains back into the sump and, therefore, is not lost, as is usual with two-stroke lubrication.

The oil from the throttle-controlled, or metering, pump is delivered to the main

bearings, the big ends and the little ends. An interesting little feature is that the oil returning to the sump from the auxiliary drives passes the cylinder skirts and thereby assists in the cooling. A simple dash-pot connection, such as is used for connecting the throttles of twin carburettors, is employed for linking the oil pump with the throttle.

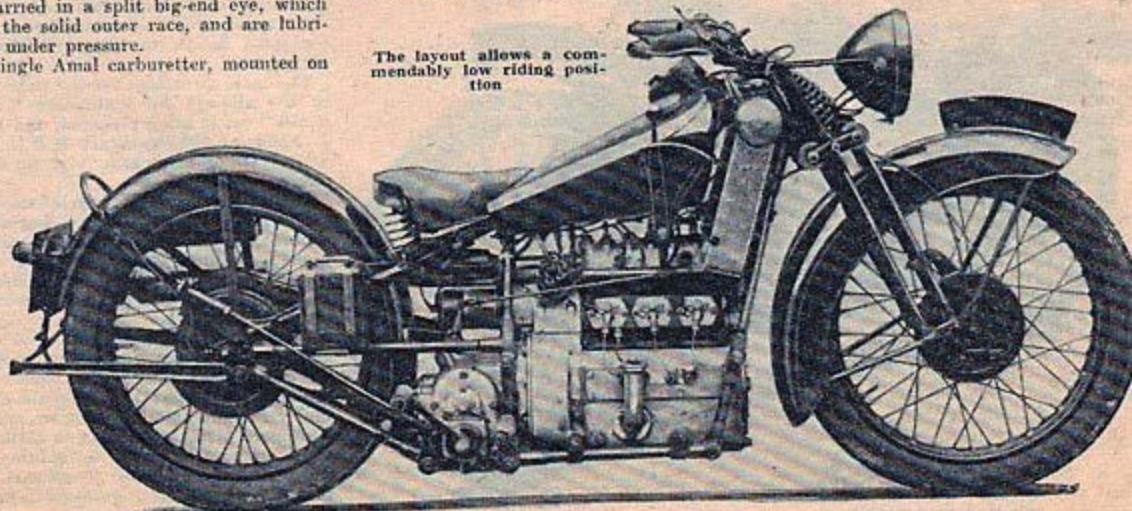
At the rear of the engine is an eight-inch-diameter flywheel embodying a single-plate clutch of the dry-plate type. Immediately behind the clutch, engaging with the driven member by splines, is the spiral bevel that provides the necessary right-angle drive for the final transmission, which is by chain—the only chain in the whole design.

The gear box is of the constant-mesh type and provides four ratios. The gear box ratios are 1.94, 2.45, 3.9 and 6.1 to 1, which give, with the 18-tooth sprocket fitted to the machine undergoing road test, ratios of 4.30, 5.44, 8.66 and 13.5 to 1. The machine, it should be mentioned, is fitted with 28×3.50 in. tyres.

The Frame

In its detail work the machine is typically Scott, with its large brakes, Brampton bottom-link front forks, large gear-box filler, upturned handlebars and radiator mounting, but the frame layout is unusual. The frame is of the duplex loop type with twin saddle-tube members, a single large-diameter top tube, two front down tubes, chain stays and torque stays. At first sight the torque stay appears to be a continuation of the members running on either side of the base of the crank case, but in order to facilitate the removal of the engine and gear unit there is a short channel section between the bottom of the seat-pillar tubes and the front of the torque stay. This obviates the trouble that would otherwise occur in regard to the kick

The layout allows a commendably low riding position

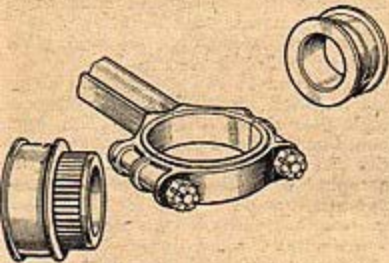


A Three-cylinder Unit-construction Two-stroke—

starter extension fouling the frame, and enables the frame to be lifted from over the unit when the latter has been dropped.

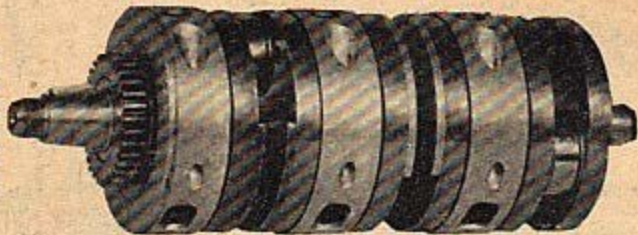
An extremely rigid engine fixing is employed; the unit is attached to the frame by six large transverse bolts.

Other features of the machine are a



Arrangement of the big end: on the left is shown a complete bearing; in the middle the split big end eye, and on the right an inner race

The crankshaft, showing the discs or drums which divide the crank chamber into three separate crank cases (a fourth disc at the front end is not shown) and act as bearing housings



kick-starter that swings round against the footrest fixing to form a prop-stand, a large and accessible oil filler with dipstick on the off side of the unit, and a wedge-shaped saddle tank. The ground clearance is approximately 5in., while the overall height of the engine, exclusive of the sparking plugs, is just over 16½in. The length of the cylinder casting is 11in. and of the whole unit 26in.

On the machine that is being tested coil ignition is employed, and the dynamo is mounted over the gear box and driven off a pinion mounted at the rear end of the crankshaft; the distributor is

arranged at a convenient angle on the off side close to the front end of the dynamo, and the coil immediately beneath the saddle. Magneto ignition is optional.

A full report of the performance of the new Scott on the road will be published as soon as *The Motor Cycle* tests are complete. From the experience gained so far it can be said that this novel three cylinder is one of the most fascinating motor cycles that has ever been produced.

The makers are the Scott Motor Cycle Company, of Shipley, Yorkshire, and 73, Charlotte Street, London, W.1.