Royal Enfield

★ ★ *'Made like a Gun'* ★

Three High-performance Twins

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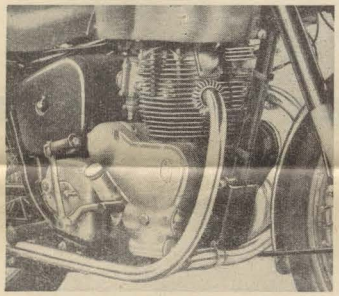
Three High-performance

Royal Enfields Introduce a Super-Sports Seven-hundred and hundreds With 29-inch Seat Height : Ingenious Clutch

THREE exciting additions to the Royal Enfield range are to go into immediate production. High-performance vertical twins developed from the successful Super Meteor roadster (which retains its place in the programme), they comprise a super-sports seven-hundred named Constellation and standard and de luxe versions of an entirely new five-hundred of cobby build, the Meteor Minor. Common to all three models is an unusual clutch-withdrawal mechanism which permits the installation of a heavy-duty clutch capable of transmitting the full torque of the Constellation without any increase in the manual effort required to operate it.

Most potent of the trio of newcomers, the 692 c.c. Constellation twin is, in effect, a specially tuned counterpart of the Super Meteor roadster. Externally the engines of the two models are similar; bore and stroke remain the same at 70 × 90mm. But there are essential differences in the specification of the Constellation which give it a claimed power output of 50 b.h.p. at 6,250 r.p.m. During extended road tests, prototype machines are reported to have exceeded 110 m.p.h. Although the machine as a whole has not previously made a *début* in Britain the modified engine has been in full production for well over a year and was originally designed to meet a specific export contract.



Like that of the Super Meteor on which it is based, the Constellation engine features a one-piece crankshaft supported in a ball bearing on the drive side and a roller bearing on the timing side. To cope with the increased power output the material used for the shaft is high-tensile nodular iron. Crankpins are of 1⅞in diameter and the H-section light-alloy connecting rods are fitted with shell-type big-end bearings. The crankcase assembly follows traditional Royal Enfield practice in that a half-gallon oil container is embodied in the main castings. Driven by a two-start worm on the timing end of the crankshaft, the oil pump is of duplex oscillating pattern. Beneath the timing chest a horizontal compartment houses a renewable fabric oil filter; oil from the feed pump passes through the filter before reaching the bearings.

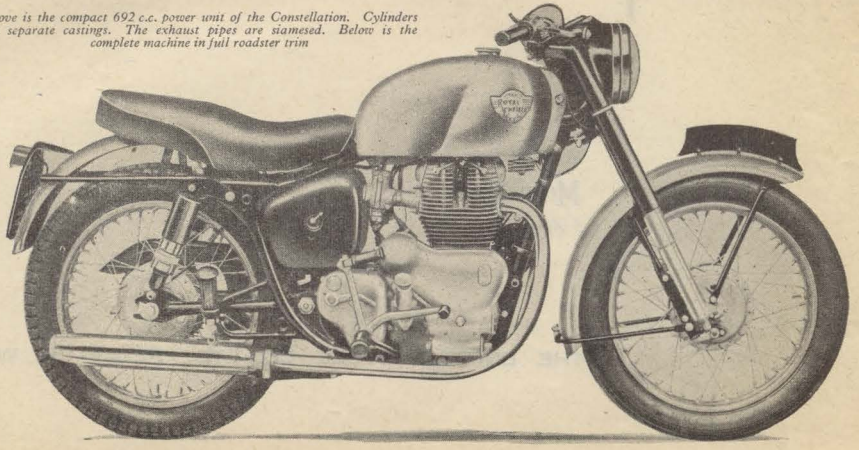
Chain-driven camshafts are located fore and aft of the cylinders. The cams are based on racing practice and provide a higher lift and longer open dwell than is customary on a roadster; undoubtedly they contribute to the sparkling performance, as also do pistons giving a compression ratio of 8.5 to 1.

On the timing cover, opposite the end of the exhaust camshaft, there is a detachable plate which affords a means of mounting a rev-meter drive. The rev-meter gear box has a projecting tongue to engage with a special coupling which fits over the camshaft retaining nut. The rev-meter, gear box, coupling and drive cable will be made available at extra cost.

Independent cast-iron cylinder barrels are fitted. Heavily finned, the heads are of light alloy and feature shrunk-in valve inserts of austenitic iron. Exhaust valves are in En.54 austenitic steel and for the inlet valves En.52, a silicon-chromium steel, is used. Pushrods are formed from light-alloy tubing.

A single Amal T.T.-pattern carburettor of 1⅜in bore is fitted, mounted on a light-alloy induction manifold; the bores of the manifold and of the cylinder-head induction tracts are carefully mated to provide

Above is the compact 692 c.c. power unit of the Constellation. Cylinders are separate castings. The exhaust pipes are siamesed. Below is the complete machine in full roadster trim



Twins

Two Compact Five-

Withdrawal Mechanism

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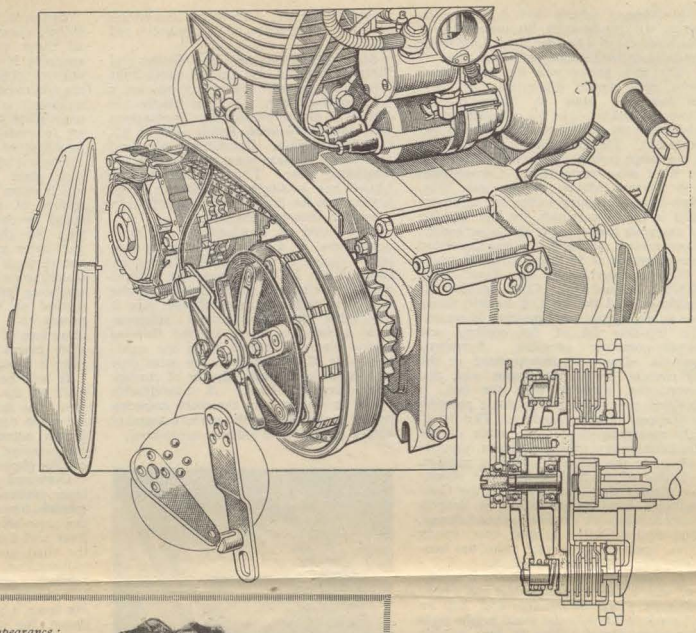
Details of the Meteor Minor primary transmission and of the clutch-withdrawal mechanism common to all three of the new models. Rotary movement imparted by cable to the clutch lever causes four steel balls to ride out of indentations in the clutch and fixed levers and hence moves the clutch lever laterally to the left. The lateral movement draws the inner pressure plate away from the friction plates through the medium of the central bolt, thus further compressing the clutch springs held by the outer plate. Both plates rotate with the clutch



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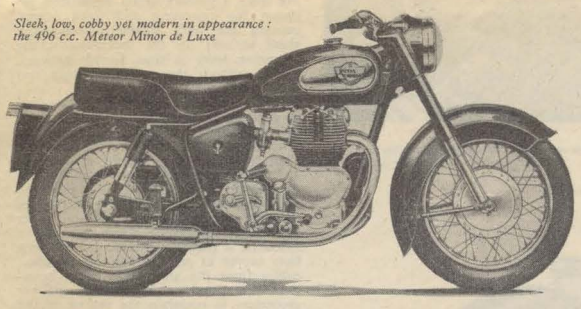
Sleek, low, cobby yet modern in appearance : the 496 c.c. Meteor Minor de Luxe



an unrestricted gas flow. The carburettor intake is connected by a rubber hose to a fabric-element air filter.

Housed within the light-alloy primary chaincase is a crankshaft-mounted Lucas RM14 A.C. generator of 70-watt output which feeds the battery through a normal rectifier. In this instance, however, the current so generated is used only for the lights and horn; ignition is by a Lucas K2F magneto with manual control.

Frame of the model is similar to that used for the existing twins and Bullet singles. A malleable steering-head lug is allied to a frame of otherwise all-welded construction. In place of conventional seat tubes are twin tubular loops which are attached to the rear of the 1½in-diameter top tube. The loops sweep rearward and downward to pass behind a large pressed-steel box which houses the tool kit, battery and air filter, then curve forward beneath the gear box to an attachment point at the rear of the crankcase. Engine plates bolted to the lower end of the single front down tube support the front of the power unit. Bolted directly to the rear of the crankcase castings to form a compact assembly, the four-speed Albion gear box gives overall ratios of 4.44, 5.77, 7.99 and 12.35 to 1. An independent neutral-finder pedal is fitted.

Of telescopic pattern, the front fork carries the wheel spindle slightly ahead of the fork legs. At the upper end of the fork is a light-alloy casquette into which are set the headlamp, speedometer and twin pilot lights. Control of the pivoted rear fork is by Armstrong hydraulically damped spring units with adjustment for various loads.

Other items in the Constellation specification include a steering damper (the model is thus the only one in the Royal Enfield range to be so equipped) and a deep, 4½-gallon fuel tank with recesses for the rider's knees towards the rear. The tank is fully chromium plated but to obviate glare there is a top panel finished in polychromatic Burgundy red to match the mid-section pressing and the guard which covers the top run of the rear chain. Frame and forks are enamelled in black and the light-alloy mudguards are polished.

Sheer concentrated energy sums up the pair of Meteor Minor five-hundreds in which a new short-stroke 496 c.c. engine is married to the lightweight frame first seen on the 248 c.c. Crusader model. In spite of its bulk, the power unit fits the available space neatly. A seat height of only 29in results from the employment of

17in-diameter wheels and 3.25in-section tyres. In consequence, the mount has all the beefiness of a five-hundred allied to the traditional handleability of a two-fifty.

The new power unit has over-square bore and stroke dimensions of 70 × 64.5mm—the same as those of the Crusader indeed—but the cylinder barrels and heads are similar to those of the Constellation. The short-throw crankshaft is a one-piece casting of Meehanite iron but in most other respects the Constellation and Meteor Minor engines are alike. New-type quietening ramps are incorporated in the cams which are less sporting in character than those of the larger model. Compression ratio is 8 to 1 and the stated power output is 30 b.h.p. at 6,250 r.p.m.

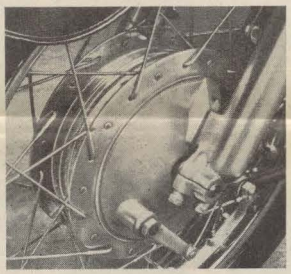
The carburettor is an Amal Type 376/92 Monobloc. Coil ignition is employed and the ignition switch, which has an emergency-start position, is set into the left-side lid of the toolbox and battery-container pressing. Automatic ignition advance is incorporated in the lightweight Lucas distributor and this component, together with the coil, is shielded by a tidy, wedge-shape pressing at the rear of the cylinders. The drive-side mainshaft carries the rotor of the Lucas alternator which, of course, supplies current to the battery through a rectifier.

Frame of the Meteor Minor is shorter and lighter than that used for the Constellation but, except that it is entirely welded, it follows the same general design. The hydraulically damped rear spring units, again of Armstrong make, are non-adjustable. Wheelbase is 52 in.

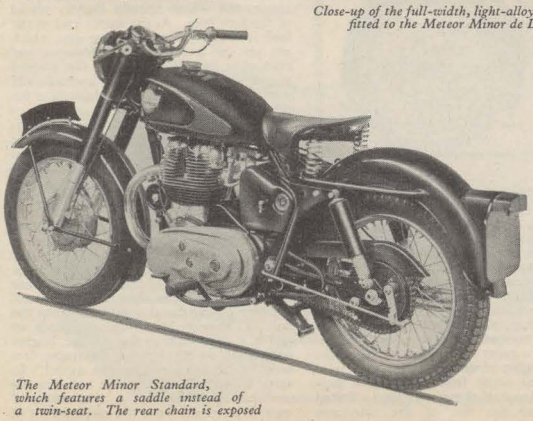
In standard form the machine is equipped with a Terry spring saddle and a non-valanced front mudguard and has an all-black finish with the usual bright parts chromium plated. The de luxe version has a twin-seat and pillion footrests, a deeply valanced front mudguard with registration facings on the valances, a quickly detachable rear wheel and total enclosure of the rear chain. Other de luxe features include an air filter, a stop lamp, chromium-plated tank panels and a choice of black, silver-grey, Wedgwood blue or polychromatic Burgundy red finishes.

Standardized on the Constellation and Meteor Minor de luxe are full-width hubs which, on the rear wheel, incorporate a 7in-diameter brake. The Constellation, in view of its higher performance, is equipped with the well-known Royal Enfield 6in dual front brakes. Operating cables lead to a small balance beam attached to the handlebar lever. The standard Meteor Minor has a single 6in-diameter front brake while for the de luxe model there is a new 7in-diameter component.

Also fitted as standard to the three newcomers is a siamesed exhaust-pipe layout similar to that used for the factory twins in the I.S.D.T. Near the exhaust ports a bracing rod passes through bosses welded to each pipe; the left-side pipe is detachable for maintenance purposes from a junction ahead of the forward engine plates. Trained along the right-hand side of the machine, the main pipe terminates in a single silencer of streamlined torpedo shape. A considerable saving in weight over the more orthodox layout is claimed for the system, together with a reduction in exhaust noise level.



Close-up of the full-width, light-alloy front hub fitted to the Meteor Minor de Luxe



The Meteor Minor Standard, which features a saddle instead of a twin-seat. The rear chain is exposed

Operated from the chaincase side, the unique clutch mechanism is common to all three machines. As the operating assembly is contained within the oil-bath primary chaincase, the need for providing a bore for a thrust rod in the gear-box mainshaft is obviated. The clutch is of multi-plate pattern and the friction discs are provided with inserts of Klinger manufacture.

Load is applied to the cast-iron pressure plate by six heavy-duty springs which exert their force against the inner surface of a cast-iron outer plate, secured by three screws to pillars integral with the clutch centre. Both pressure and outer plates rotate with the clutch but through their centres passes a shaft which, at its outer end, carries the clutch-operating lever. At the inner end, a head formed on this operating shaft is supported by a thrust bearing carried in the inner face of the pressure plate; where the shaft passes through the rotating outer plate it is supported in a further bearing.

It will be realized that lateral movement of the shaft to the left will allow it to pass through the outer plate but at the same time the pressure plate will be drawn outward by the shaft head, so compressing the clutch springs and freeing the plates.

Outboard of the outer plate a fixed lever embraces the operating shaft and extends forward to an anchorage on the chaincase-securing bolt. Between this lever and the operating lever attached to the shaft are four steel balls located in indentations. Under the action of the handlebar lever through a cable attached to a stirrup at the extremity of the operating lever, a scissors action is induced between the operating and fixed levers, causing the balls sandwiched between them to ride up the indentations; the operating lever is thus forced outward, taking with it the operating shaft and the clutch pressure plate.

The outer end of the shaft is threaded to accommodate a lock nut which holds the operating lever securely in place; by releasing the lock nut and turning the shaft by means of a screwdriver slot provided, the clutch may be adjusted to compensate for wear of the friction surfaces.

The clutch operating cable passes through a hole in a boss cast in the inner half of the chaincase above the engine sprocket; a parallel aperture in the same boss serves as an exit for the electrical cables from the alternator. Both openings are fitted with oil-proof rubber grommets to maintain the sealing of the chaincase.

Smooth transmission is ensured by two shock absorbers; in addition to the famous Royal Enfield cush drive in the rear hub, there is also a vane-type shock absorber incorporated in the clutch centre unit. Ease of maintenance is an attractive feature of the new clutch, for by releasing the three screws securing the outer plate to the clutch centre the withdrawal mechanism can be detached in its entirety without upsetting the adjustment. The clutch plates can then be removed and inspected without the necessity for further dismantling.

Makers are The Enfield Cycle Co., Ltd., Redditch, Worcestershire.

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