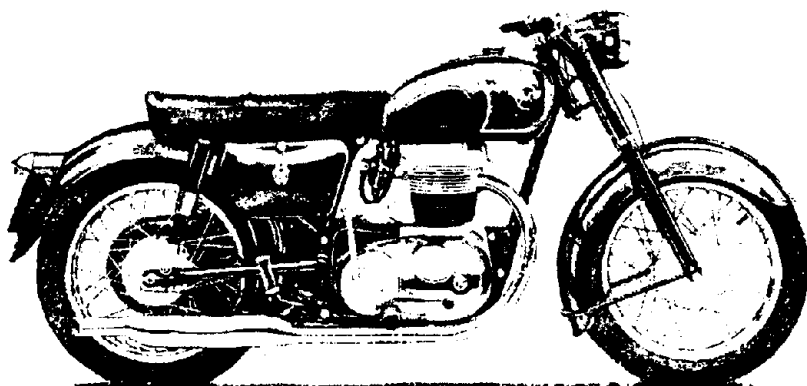
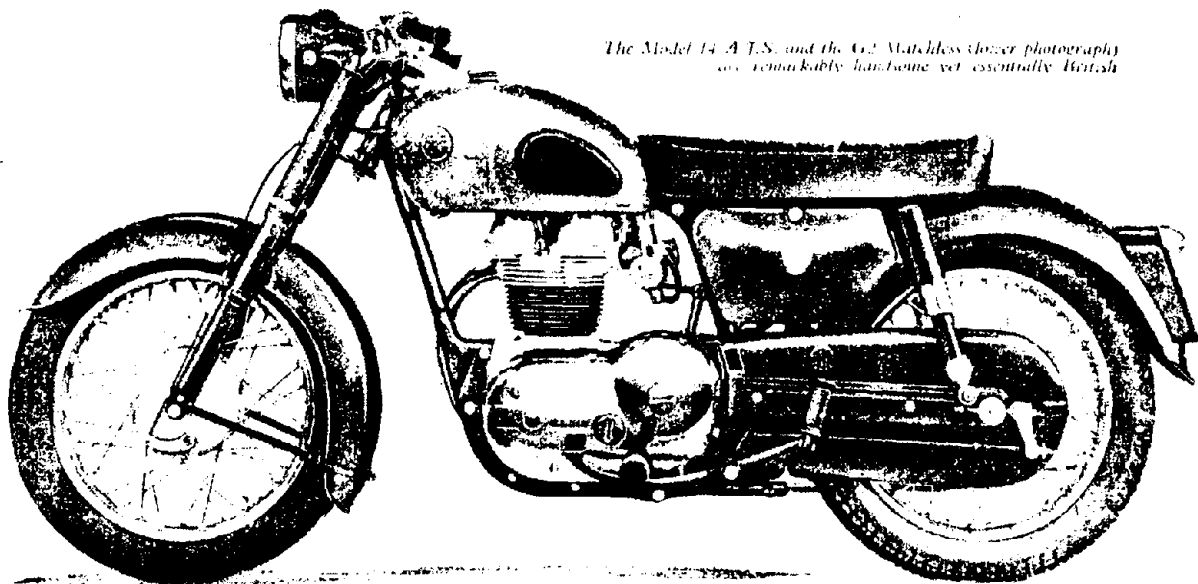
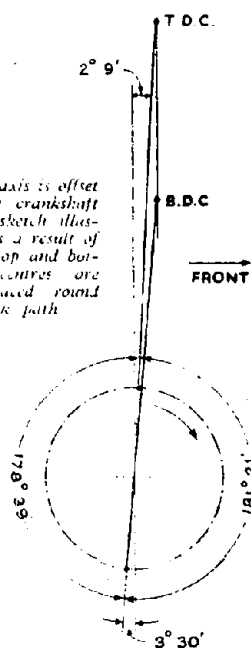


The Model 14 A.T.S. and the G2 Matchless (lower photograph) are remarkably handsome yet essentially British



The cylinder axis is offset ahead of the crankshaft axis. This sketch illustrates how, as a result of that layout, top and bottom dead centres are anomalously spaced round the crank path.



not great and the system was chosen not just for those minor benefits stated but also because it fitted in with the general geometry of the engine. A single camshaft with two trailing lever-type followers was one of the fundamental design requirements and by positioning the cylinder forward and the camshaft rearward of the crankshaft axis, more room was obtained for the cams and followers.

A further requirement was a minimum of side thrust on the followers, which meant that the pushrods had to be as near as possible vertical in front elevation. Rotation of the plane of the valves (through 21½ degrees clockwise, seen from above) made this practicable without the use of rocker spindles of different lengths and had the additional advantage that it brought the exhaust port and sparking plug more directly into the air stream, to ensure maximum cooling.

The cylinder head is in DTD 424 aluminium alloy and has a part-spherical combustion space with cast-in valve seats of austenitic cast iron. In addition to the deep horizontal finning there are diagonal vertical fins on the left to direct air over the sparking plug and combustion chamber. The silicon-chromium inlet

valve is considerably larger than the exhaust valve, which is of Jessops G2 steel (respective head diameters are 1⅞ and 1⅝ in). Because of this difference, and the wish to avoid too sharp a bend in the exhaust tract, the valve included angle of 75 degrees is split unequally: the inlet valve is at 35 degrees to the vertical and the exhaust valve is at 40 degrees.

Swirl is imparted to the charge and adequate scouring of the sparking plug achieved by offsetting the inlet tract 10 degrees towards the right of the centre line of the head. The exhaust tract, too, is offset to the right—by 11½ degrees—and is counterbored at its forward end to take the push-in 1½-in-diameter exhaust pipe. Choke diameter of the Type 376 Amal Monobloc carburettor is 1⅝ in and the downdraught angle is 12 degrees. There is a thick heat-insulating spacer between the carburettor and cylinder-head flanges.

Valve guides, of cast iron, are located axially by circlips and crossover hairpin valve springs are employed. Four long studs screwed into the crankcase hold down the cylinder barrel and head; the separate die-cast rocker box is attached to the head by nine bolts. Rockers are

of typical A.M.C. built-up construction: on each, the arms are spinned to the ends of a "live" spindle and are separated by a hardened sleeve to which they are clamped by nuts on the spindle ends. Each rocker is supported by two bronze bushes with an oil-retaining felt sleeve between them. Owing to the unequal valve angles in the head, and the desirability of utilizing interchangeable pushrods, the exhaust rocker is mounted slightly lower in the box than the inlet rocker.

For simplicity and quiet running, the single camshaft is driven directly by the crankshaft pinion. Ends of the camshaft are supported in bronze bushes, one in the

There are no external oil pipes and the fabric filter is on the left of the engine. Two ball bearings support the drive-side mainshaft which carries the rotor of the A.C. generator—which is of Wico-Pacy manufacture

crankcase wall and the other in a light-alloy bolted-on case which surrounds the gears. On the outside of the case is the contact-breaker unit, actuated by an extension of the camshaft and embodying centrifugal automatic control of the ignition timing.

The cam followers have curved rubbing faces and oscillate directly on a common spindle ahead of the camshaft. Of light-alloy tubing, the pushrods are fitted with steel ends, the upper of which embody the valve-clearance adjusters. The rods are appreciably splayed and operate in a single cored tunnel of figure-eight section in the barrel; in the head each has its own tunnel.

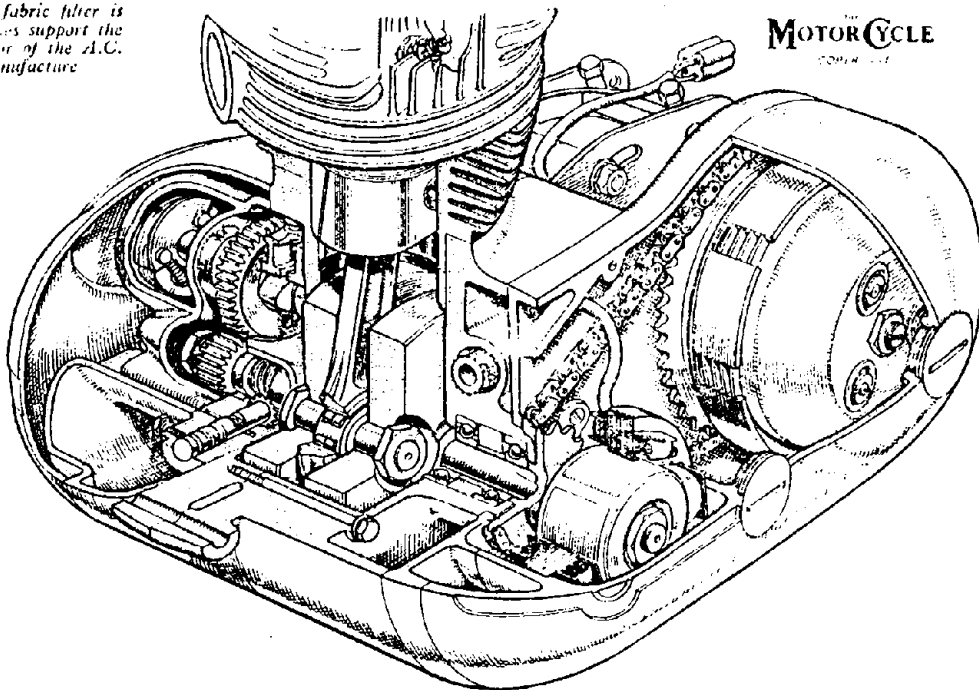
Following normal A.M.C. practice, the piston is wire wound above the gudgeon pin and has a split skirt. It carries a scraper ring and two compression rings, the upper of which is chromium plated (to obviate scuffing) and has a taper face for quick bedding-in. The piston crown features a shallow dome and flats to provide valve-head clearance during the overlap period. Standard compression ratio is 7.8 to 1.

The connecting rod, or 1 per cent chromium steel, measures $5\frac{1}{2}$ in between the centres; within the ribbed big-end eye is a hardened-steel sleeve which forms the roller track; the small-end bush is of aluminium alloy. Comprising the big-end bearing are two rows of $\frac{1}{4}$ in \times $\frac{1}{2}$ in rollers, 10 in each, spaced by a Duralumin cage. Nominal crankpin diameter is 1.2in and En. 351 is used for the hardened roller-track sleeve, on a body of KE805. The pin is a parallel press fit in the high-grade cast-iron flywheels (which measure $6\frac{1}{2}$ in diameter by $\frac{3}{8}$ in rim width) and is secured by nuts.

Of Ubas steel and with a journal diameter of $\frac{1}{2}$ in, the mainshafts have flanged inner ends and, too, are a parallel interference fit in the flywheels; each is located by a Woodruff key. Two ball bearings support the drive-side shaft, their inner races spaced by the keyed-on sleeve of the timed crankcase breather which discharges to the rear of the case. Timing-side bearing is a long bronze bush, cut out on its underside to accommodate the oil-pump worm drive.

The engine sprocket is splined on to the drive-side mainshaft and outboard of it is the rotor of the Wico-Pacy A.C. generator; the stator is carried in the outer half of the primary chaincase and both sides of the inner half of the case are dowelled to ensure accuracy of alignment. The drive-side crankcase half mates up with the primary chaincase and the timing-side half blends into a domed cover which carries a circular plate giving access to the contact breaker.

The reciprocating plunger oil pump, worm driven from the timing-side main-



shaft, is similar in design and operation to those fitted to the other A.J.S. and Matchless singles. It draws oil from a 2 $\frac{1}{2}$ -pint oil container of kidney shape which is bolted to the outside of the timing-side crankcase half, ahead of the timing case; the in-board wall of the container is formed by the crankcase and the filler neck is in the case.

Some of the oil picked up by the supply side of the pump is fed to the worm chamber and passes through holes in the root of the worm thread into the mainshaft whence it travels to the big-end bearing through drillways. The balance of lubricant travels to the overhead rocker shafts via passages in the barrel and head. Grooves in the sides of the valve-operating arms of the rockers lead some of the emerging oil to the valve-stem ends—and there is an adjustable bleed to the inlet valve guide.

Lubricant drains from the valve compartment down the pushrod tunnels to the timing gear; from the timing chest it overflows into the crankcase to join that thrown out from the big end. The scavenger pump picks up the oil from the bottom of the case and passes it across the rear of the engine to the felt-cartridge oil filter, mounted longitudinally in the left half of the crankcase and removable from the front. From the filter the oil returns across ahead of the cylinder and, with the filler cap open, can be seen re-entering the tank.

Although no official claims are made for the power output and torque of the power unit, it is stated that prototypes have been running up to 7,400 r.p.m. and producing over 18 b.h.p. on the bench.

The most ingenious single feature of the new models is the combination of the neatness of an integral gear box with the ease of dismantling or unit replacement afforded by a separate box.

Orthodox adjustment of the primary chain, too, is achieved. The gear box has a cylindrical shell which butts against substantial faces of matching curvature on the rear of the crankcase; the right-hand end cover of the box fits snugly within a hole in the engine side cover. Since the mainshaft lies appreciably above the shell axis, rotation of the shell alters the position of the primary-chain centres. The mounting is identical in principle with that commonly used for belt-driven dynamos on cars.

The gear box is held on its seating by two substantial steel straps attached under the rear of the crankcase. At the upper ends of the straps are eye blocks threaded to take tensioning bolts passing through a bar bridging the two steel plates which embrace the gear box and are bolted to the crankcase and frame seat tube to form the rear mounting of the power unit. A draw bolt of normal pattern rotates the gear box after the straps are slackened. The drawbolt and the strap bolts are readily accessible on removal of a pressed-steel cover plate which is secured by two screws and, curving well round the back of the gear box, gives an extremely neat appearance with no indication of what lies beneath.

In the interest of standardization, the four-speed gear cluster is identical with that of the two-fifty A.M.C. two-stroke and provides internal ratios of 1, 1.30, 1.85 and 2.95 to 1. The foot-change and selector arrangements, too, are similar but the clutch thrust operation resembles that of the larger gear box for four-strokes in that the floating cable arm pivots on a thrust ball and has on its other face a cam profile bearing on a fixed-centre roller.

Primary drive is by $\frac{1}{2} \times 0.225$ in simple chain running on sprockets having 21 and 50 teeth. The clutch employs four friction plates with bonded-on oil-resisting

material and embodies in its centre a vane-type transmission shock absorber employing rubber blocks as the resilient medium. In the outer half of the primary chaincase are two large holes closed by screw-in plugs; the forward hole serves as a combined inspection, filling and level orifice and the other gives access to the adjuster at the centre of the clutch pressure plate. Final drive is by $1 \frac{1}{2} \times 0.305$ in chain on 19- and 55-tooth sprockets. Overall top gear is thus 6.9 to 1.

The malleable-iron steering-head lug of the frame is gusseted for extra stiffness and into it is brazed the $1 \frac{1}{2}$ in \times 14-gauge top tube which curves downward at the rear of the petrol tank to become the seat tube. Part-way down it passes through another malleable lug in the front of which are two bosses for the attachment of the

gear-box plates already described. This lug also incorporates the pivot bearing of the rear-suspension fork; the spindle runs in bronze bushes and the seat tube is scalloped out within the lug to provide spindle clearance. Further bosses on the lug form the attachment points for the diagonal tubes of the rear sub-frame.

Dimensions of the single front-down tube of the frame are $1 \frac{1}{2}$ in diameter and 14 gauge. At the top the tube is brazed into the steering-head lug and its lower end carries a brazed-on sleeve to which is welded a fabricated pressed-steel box member in the form of a tilted pyramid. This box member supports the front of the crankcase at two points.

In addition to the previously mentioned seat-tube attachment through the gear-box plates, the crankcase is linked to the

bottom of the seat tube by a 12-gauge steel pressing of inverted channel-section. The pressing is held to the tube by the mounting bolt for the pillion footrest; it extends behind the tube to the rear main-guard and to its rearward end is welded the tubular silencer-support stay.

A second pressing, of 14-gauge channel section is also clamped to the bottom of the seat tube. It lies beneath and within the 12-gauge channel and extends forward beneath the crankcase, turning upward at the front to mate with the engine mounting pyramid. The result is a frame cradle of remarkably neat appearance, free from nooks and crannies to harbour dirt.

To the upper of the two pressings are welded bosses which carry the square-section bar supporting the rider's footrests. The bar passes through a spacer tube between the flanges of the channel. Outboard of the bosses are short sleeves on which the centre stand pivots. In the footrest hangers are triple-square (i.e., twelve-point-star) holes which permit adjustment in steps of 30 degrees.

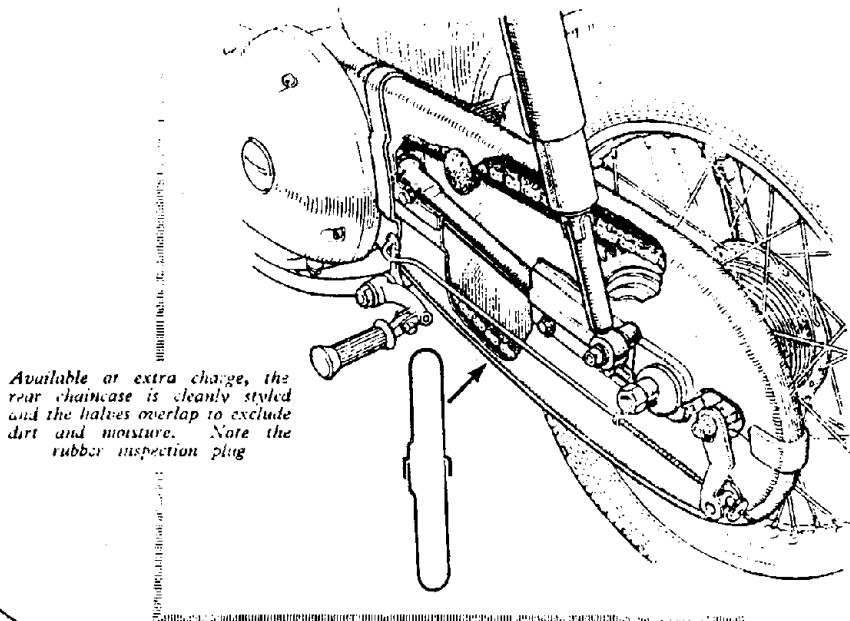
The return spring of the tubular centre stand is cleverly concealed within the channel pressings. Welded-in ears behind the pivot eyes of the stand are linked by a double cranked rod passing through slots in the lower pressing. In the middle the rod is slightly "joggled" to locate one end of the spring; the other end hooks over the footrest spacer tube. The slotted forward attachment of the lower pressing permits it to be hinged down (after the slackening or removal of the various cradle bolts) for access to the spring in the event of breakage.

Of $\frac{1}{2}$ in tubing the horizontal strays of the rear sub-frame are bolted at their forward ends to bosses on the bend of the top tube. At the rear they are welded and gusseted to the $\frac{1}{2}$ in diagonal tubes and the joints are bridged by a transverse tube carrying studs which support the upper ends of the adjustable Goring rear legs. The sub-frame is unusually narrow and is almost completely hidden by the dual-seat and the matching side cases.

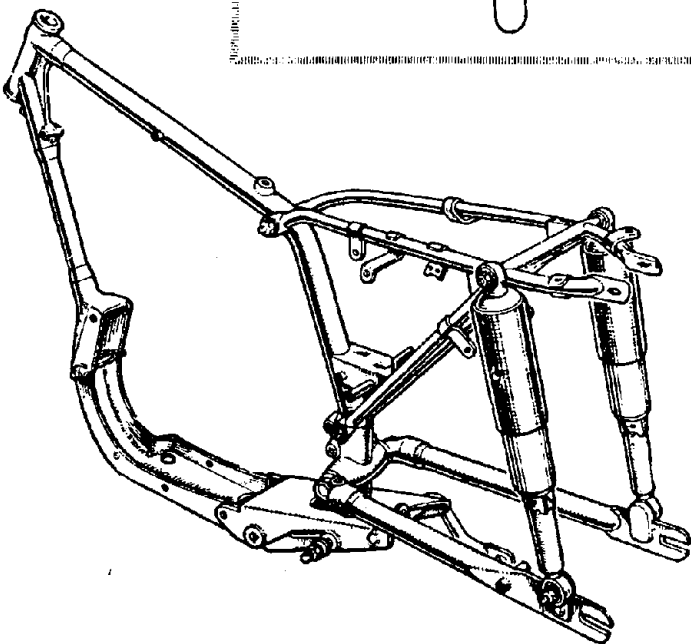
The arms of the pivoted rear fork are of $1 \frac{1}{2}$ in \times 14-gauge tubing and their forward ends are brazed into malleable-iron lugs. Pressed into the right-hand lug, and welded to it on the outside for security, is the pivot spindle; the left-hand lug is split and is fitted with a cotter. The sleeved and trapped rear ends of the arms are slotted to take the wheel spindle.

Of pressed steel, the side cases mentioned earlier are cleverly shaped to blend with the lines of the machine and conceal the ignition coil, rectifier, horn and 12-ampere-hour battery which are stowed beneath the seat. The battery sits on a platform welded to the seat tube and is secured by a rubber strap. It is readily accessible when the right-hand lid is hinged down. Within the lid, which is of deep section, is the tool kit in a compartment formed by a second, internal lid. When fitted (it is an optional extra) the air filter is located within the left-hand case.

The telescopic front fork is hydraulically damped and its pressed-steel upper yoke has extensions to carry the 6-in-diameter Wipac headlamp. The yoke fits closely round the rear of the headlamp



Available at extra charge, the rear chaincase is cleanly styled and the halves overlap to exclude dirt and moisture. Note the rubber inspection plug



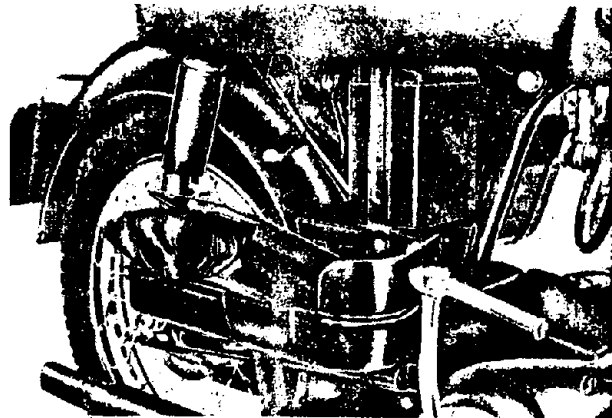
The frame is of simple design and the lower portion comprises two channel-section pressings. A cotter locates the left-hand arm of the rear fork

body in which are mounted the speedometer, ammeter and the separate ignition and lighting switches. Adjustment for the grip angle of the handlebar is permitted by hemispherical ends on the short risers on the bar; in these ends are studs which pass through slotted holes in dimples in the yoke. Clutch and front-brake controls have welded-on pivot blocks and the levers are hooded. On the left side of the handlebar is a combined dip switch and horn button of the latest Wipac ring design.

Both mudguards are very shapely and of deep helmet section. The rear guard has no visible stays and for the close-fitting front guard there is only a tubular hairpin stay at the lower end. To add to the clean appearance, it is intended that the front registration numbers should be painted on or attached to the valances of the mudguard. Wheel size is 17in, admirably suited to the proportions of the machine, and the rims are chromium plated; tyre section is 3.25in front and rear. Brake diameter is 6in and hubs are of full-width pattern. The rear-brake pedal pivots on a sleeve on the pillion footrest bolt and has a concealed return spring.

In standard form the machine has a deep-section guard over the upper run of the rear chain but, as mentioned, a chain-case is available at extra charge. The case is divided horizontally and embraces the

Battery, horn, coil and rectifier are concealed under the dual-seat by sheet-metal cases. The tool kit is stowed within the other case



tork arm (to which the upper and lower halves are bolted; the edges of the halves overlap to prevent the ingress of road dirt and water. Forward end of the case is shielded by a sheet-metal section bolted to the back of the primary chaincase.

Nominal wheelbase is 53in and the weight is about 325 lb. Finish of frame and mudguards is black stove enamel. Capacity of the petrol tank is 2½ gallons and it is finished in Mediterranean blue with gold lining on the A.J.S. and in Cardinal red with silver lining on the

Matchless. The appropriate tank colour is repeated in a flash on each side of the engine castings which also carry a small replica of the tank badge.

It is anticipated that production will start in May but initially the output will be exported. Foreign prices are being announced at the Geneva Show and home-market prices as soon as possible thereafter; in both cases they are expected to be highly competitive. Manufacturers are Associated Motor Cycles, Ltd., Plumstead Road, London, S.E.18.

ACCESSORIES REVIEW

Helmet Holdalls

MANUFACTURED in weatherproof plastic material, Stadium helmet bags—holdalls, as they are called—are available in two sizes—one to take two helmets, the other to hold one. Each holdall is big enough also to accommodate goggles and gloves. After the helmet has been inserted the zip fastener is drawn closed, a strap fitted to the zip catch is passed through a ring attached to the bag, slipped over the



Above is a pair of Waddington Scooter Gauntlets and below is a Stadium helmet holdall

handlebar inboard of the clutch or front-brake lever and then inserted into the lock. When not in use the bag can be folded up to slip into a riding-coat pocket. The No. 656 (one helmet) costs 17s 6d and the No. 656/2 (two helmets) 22s 6d. Makers are Stadium, Ltd., 30-36, Queensway, Ponders End, Enfield, Middlesex.

Ladies' Gloves

ON test, a pair of Waddington Scooter Gauntlets for women recently proved to be thoroughly comfortable and warm without excessive bulk. The gloves are made of supple but hard-wearing hide, with a white fleecy lining and an elasticated wrist to keep out draughts. Colour of the pair tested was a pleasing, soft red which remained completely fast under wet conditions; alternative colours are blue and green.

Price of the standard Scooter Gauntlets is £1 19s 6d a pair, but a de luxe version with lambskin lining for the hands and shearling-lined gauntlet portions is available at £3 2s 6d. The makers are G. Waddington and Son, Ltd., Newland, Hull.

Riding Suit

A TWO-PIECE riding suit by Reg Cross—famous for his racing leathers—has been in regular use for well over a year and has given thorough satisfaction. Made of waxed Egyptian cotton, dyed black, it has proved both hard wearing and completely waterproof. Lined in dark blue denim-type material, the suit is comfortably warm for its weight and does not suffer unduly from condensation.

Cross road-going suits have been developed from the one-piece unlined pattern made for wearing over leathers under wet conditions. All suits are made only to order and to the customer's specification, so that special ideas can be embodied. The jacket of the suit tested had a corduroy-lined, strap-adjusted



Neat and waterproof—a Reg Cross suit

stand-up collar, four pleated pockets and press-studded cuffs. The trousers have braces support, a zip-closed fly front with covering flap and side access slits similarly equipped.

Prices of the one-piece suits are £6 10s (unlined) and £8 10s (lined); a two-piece suit costs between £9 and £10 depending on the style and details of the specification. The maker is Reg Cross, Louth, Lincs.

