

The Lightweight of Distinction

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Not For Resale



THE CLYNO

ENGINEERING CO.,
WOLVERHAMPTON.

Telegrams: "Clyno, Wolverhampton."
Telephone: 992 (2 lines).

INTRODUCTION.

THIS Booklet indicates a new departure in the Clyno business. For some years we have specialized in the production of a Motor Cycle for Sidecar work, but feeling that there was a very large market for a reliable Light-weight Solo Machine, and also having recently made extensive alterations and additions to our factory and plant, it was decided that we would enter this new field and the result is the machine which is described and illustrated herewith.

Starting thus we were in an excellent position, for we were able to take advantage of public experience with, and the capabilities of, the various Light-weight Motor Cycles then on the road. We were not hampered in any way or tied down to existing designs nor were we compelled, from a manufacturer economy point of view, to use old patterns, jigs, tools, or old stock; we were able to proceed with absolutely unbiased opinion, and to develop along whatever should be decided to be the best lines.

After a great deal of thought, and figure discussions, and careful comparisons, it was decided that the Clyno Light-weight Solo Machine should embody the following points:—



1. A two-stroke engine, on account of its simplicity and few number of moving parts.
2. A serviceable and simple two-speed gear.
3. A multiple disc clutch.
4. Belt drive (provided a large diameter belt pulley could be fitted).
5. 26in. wheels, on account of the desirability of using a size of tyre which would be easily obtainable.
6. Strength and rigidity.
7. Simplicity.
8. The machine should be marketed complete, ready for the road, including lamp, horn, etc.
9. Moderate price.

Designs were drawn up embodying the above; a machine manufactured, put on the road, and thoroughly tested during the 1913 season.

In this period the new Light-weight competed in the Oxford Motor Cycling Club Hill Climb, at Arms Hill, and made a clean ascent, which was much admired, and which "The Motor Cycle" described as "No mean performance for so small a machine"; while "Motor Cycling" stated that "The little machine climbed the hill with ease, and it y looked as if the rider would not have minded if the gradient had stiffened to one in two."

Another more strenuous test—though a te one—was undertaken one morning in November, 1913, when the machine was ridden t to Wellington, Salop, and an ascent of Vrekin successfully made. Most Midland will know something of this Shropshire

mountain. Half the climb is over a stony, and in places, exceedingly steep track, with one very bad bend, while the second half is merely grass and rock. These and other tests perfectly satisfied us as to the capabilities of the new machine. A few alterations—the principal one being a difference in the frame to ensure a more comfortable riding position, and some detail refinements—were carried out, and the Clyno Light-weight exhibited for the first time at Olympia during the Motor Cycle Show in November, 1913. This exhibit received an enormous amount of attention; the best informed critics stated that they could find no fault with it; the general lines and appearance were admittedly extremely pleasing, but of greater importance were the extreme simplicity, stiffness, rigidity and thorough manner in which every detail had been carried out. A multiple disc clutch, a gate change, long exhaust pipe from silencer to the rear of the machine, are features which hitherto had been only associated with high-grade heavy weight machines. The fitting of a special two-speed gear, combined with the power unit, foot boards instead of foot rests, an external fly wheel covered with an aluminium shield, and an extremely large belt pulley at the driving end are features well worth consideration, and the Clyno Light-weight is put on the market with the manufacturers' greatest confidence in its success and ability to do what it is designed for, and what the rider should require from it.

The single-speed model described on page 22 is extremely simple, and at the figure at which it is listed is remarkable value for money.



What Happens in the Clyno "Two-Stroke."

The principle of the two-stroke is of course quite different from the ordinary four cycle petrol engine. In the latter case there is one explosion only in every two revolutions, whereas, in the former—the two-stroke, which is here under consideration—there is an explosion in each revolution. What happens in the cylinder is as follows:—

Supposing the piston to be at the top of its stroke, and that the combustible mixture has just been ignited. The explosion forces the piston downwards, and at a certain point the piston itself uncovers, in the front of the cylinder wall, the exhaust opening, and the burnt gases immediately start to escape. This port is uncovered slightly in advance of the inlet port on the opposite side of the cylinder wall through which enters a fresh charge of petrol and air under pressure, helping to drive out the remainder of the exhaust gas, which of course passes by means of the exhaust pipe into the silencer. Further movement of the piston, upwards, closes both these openings or ports, and on the same up-stroke the newly admitted charge of gas is compressed, and in due course fired by the electric spark from the sparking plug. The piston is again driven downward by the force of the explosion, the same sequence of events as related above being repeated each revolution.



In the previous paragraph it is stated that the explosive mixture enters the cylinders under pressure. The method of compressing the mixture, and the means by which it passes from the carburettor to the cylinder is explained below :—

The engine crank case is airtight, and on the up-stroke of the piston, a partial vacuum is formed, which induces a charge of petrol and air from the carburettor through the inlet pipe, this being the only entrance into the crank case. On the down-stroke of the piston, the inlet port into the crank case is closed by the piston itself, and the charge recently sucked into the case compressed until at a certain point in the down-stroke of the piston, the outlet port from the crank case is opened, and the charge rushes through this opening into the transfer port and on to the top of the piston, assisting in driving out the exhaust gases as stated above.

LONDON TO LAND'S END AND BACK ON THE CLYNO LIGHTWEIGHT.

“ At Liskeard we came up with Hugh Gibson (Two-stroke Clyno), whose little machine was going well and had safely negotiated all the hills.”

“ The Motor Cycle,”

16th April, 1914.

Hints to Clyno Light-weight Riders.

(1) As, in the "two-stroke" engine, the piston, in addition to its ordinary use acts as a slide valve, it is absolutely essential that it be a good fit in the cylinder, and that the rings are free in the grooves, to prevent the possibility of any of the ignited explosive mixture being blown down between the piston and the cylinder. In the Clyno Light-weight there is a detachable transfer port which can very easily be removed by undoing two nuts, and the piston and rings exposed to view.

(2) The crank case joints must be kept perfectly pressure-tight for two reasons. Firstly, because there must be no place where the suction caused by the upward stroke of the piston, can draw in any air otherwise than through the proper inlet port. Secondly should there be any leak, a certain amount of the gas would naturally be blown through when the piston comes down and compresses the charge. If at any time the joint between the covers and the cases, or between the case and cylinder, should be disturbed they should be very carefully re-made. The only satisfactory joint is one of thin brown paper coated with gold size on each side, and this should be allowed to become tacky before the covers or cylinder are put on. How leakage at the bearings is prevented is dealt with on page 10.



(3) Both the cylinder and the piston must be kept free from carbon deposit, which is much more fatal to sweet running in the "two-stroke" engine than in the ordinary four-stroke.

(4) A sparking plug which may be quite satisfactory in a four-stroke engine, will often be anything but satisfactory in a "two-stroke" engine, for the points require much more frequent attention. We strongly recommend riders of the Clyno "two-stroke" Light-weight to use the plug which we fit as standard.

(5) The silencers and exhaust pipes should have a little more frequent attention, and should be cleaned out more often than those of the ordinary machine, so as to do away with any possibility of there being the slightest back pressure.





SPECIFICATION :

ENGINE.	2½ h.p., two-stroke Patent (No. 6876/12), single inclined off-side cylinder, 70 m/m bore, 70 m/m stroke, capacity 269 c/c.
GEAR.	Special two-speed gear and free engine with gear ratios 5½ and 9½ to 1.
GATE CHANGE.	For two-speed gear on R.H. side of tank.
CLUTCH.	Multiple disc type. Handle-bar control.
FRAME.	Loop frame, made of steel weld-less tubes, Druid spring forks, carrier, front and back wheel stands, both swing-up type.
TRANSMISSION.	¾ in. "Lyco" rubber belt
WHEELS.	26 in. by 2 in., fitted with Hutchinson 26 in. by 2 in. tyres.
TANK.	Capacity: Mixture of oil and petrol, 1½ gallons. Lubricating oil, 2½ pints.
BRAKES.	Bowden front rim brake. Powerful rear brake operating on belt rim.
SILENCER.	Large capacity, with long exhaust pipe.
ALUMINIUM FOOTBOARDS.	
RUTHARDT WATERPROOF MAGNETO.	
CARBURETTOR.	Clyno—A.M.A.C 2 lever handle-bar control.
WEIGHT.	130 lbs. approximately.
PRICE.	Complete, ready for the road, £40.





The Power Unit is self-contained and comprises Engine, Carburettor, Silencer, Magneto, Two-speed Gear and Clutch, and it is possible to quickly remove the whole unit as an entirety from the frame.

ENGINE.

This is of special design (Patent No. 6876) and works on the two-stroke principle. The bore and stroke are both 70 m/m, the cubical capacity 269 c.c., and the horse-power $2\frac{1}{2}$. The design of the cylinder is of the three-port type, the inlet port being at the front with the exhaust port immediately above it. This has the advantage that the ingoing charge is warmed, and vaporization assisted while the



exhaust is cooled. The transfer port on the inside of the cylinder is worthy of special observation. This forms a passage for the gases moving from the crank case to the top of the piston. It also serves as an inspection door for easy examination of the piston and rings. A gauze is fitted over the opening to prevent any possibilities of the gases in the crank case being ignited.

A specially designed compression release valve is fitted on the top of the cylinder, and this is of such a form that it is impossible for any flame to escape. The cylinder is secured to the crank case by the usual four studs and nuts, and is set in the frame at the same angle as the front down tube. This is a departure from what might be regarded as the standard practice, but the inclined position gives better cooling, less vibration, and the machine holds the road better than when the cylinder is vertical.

The piston is illustrated on page 7, where it will be seen that there are two piston rings, while the gudgeon pin is a tapered driving fit. The connecting rod is a steel stamping, with a phosphor bronze bearing at the small end, for fitting on to the gudgeon pin, and a roller bearing at the big end connecting up to the crank pin. The crank shaft is a stamped forging carefully machined, accurately ground and running in two roller bearings, and one large plain bearing, which last is lubricated from the gear box with fresh clean oil. Special provision is made in order to ensure the crank case being gas-tight where the shaft comes through the plain bearing (all the other bearings are entirely





enclosed in the crank case itself). A special feature is that the external fly wheel is covered by an aluminium shield (as illustrated) so that no oil can possibly be thrown on the rider's legs. There are, of course, no valves or valve mechanism whatever, while the magneto is driven from the two-speed gear, as described elsewhere.

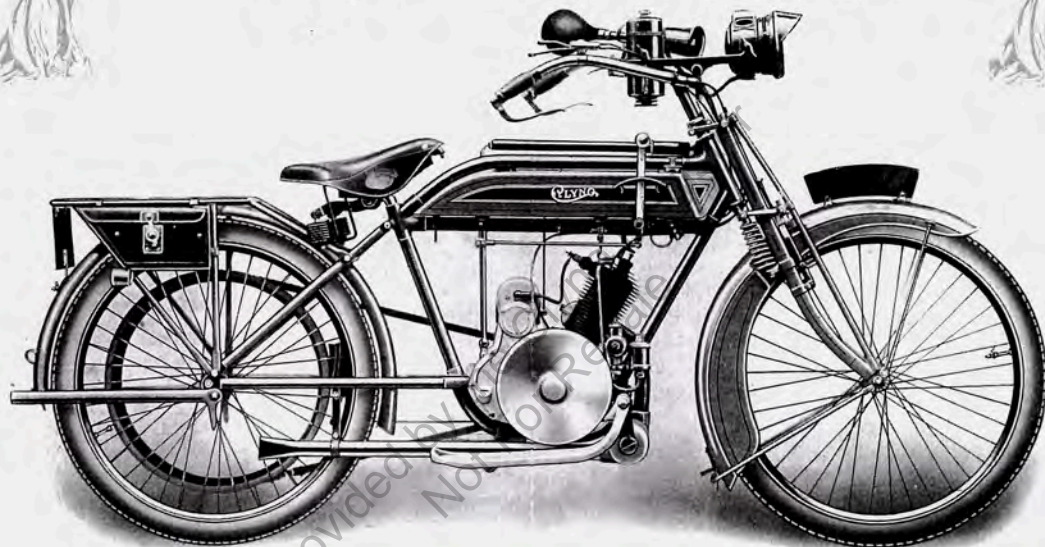
TWO-SPEED GEAR.

This is entirely contained in the main crank case casting, but is, of course, quite separate from the compartment in which the connecting rod and cranks revolve, there being in the casting itself a division between the



The Clyno

Lightweight.



£40. PRICE READY
TWO-SPEED GEAR MODEL.

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FOR THE ROAD **£40.**
TWO-SPEED GEAR MODEL.

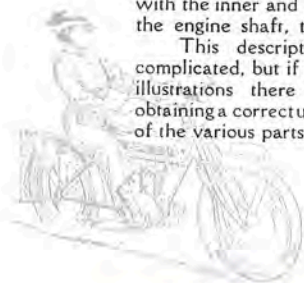
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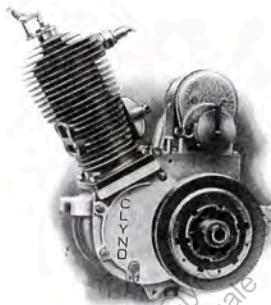
two compartments. The unique feature about this gear is the small number of moving parts; as a matter of fact, there are only six wheels in the whole power unit, including the two-speed gear and those required for the magneto drive.

Mounted on the main shaft is a double sleeve gear, the two gears being of different sizes. The smaller and outer of these two is always in mesh with a large gear wheel, which runs free on the secondary or clutch shaft.

This shaft has double feather keys, and carries a sliding gear, which is moved backward and forward through suitable connections by means of the change gear lever on the right-hand side of the tank. When the low gear is put into operation the sliding gear is moved along the shaft outwards towards the large gear. This latter is provided with a ring of holes, so situated that they mesh with four projecting pegs on the sliding gear. The result is that the large outer gear transmits the drive from the engine shaft, through the sliding gear to the clutch shaft. When the change gear lever is moved from the low gear position (1) into the top gear (2) past the neutral (0) notch in the quadrant, the sliding gear is moved out of contact with the large gear on the clutch shaft, and through the free position into contact with the inner and larger of the two gears on the engine shaft, the drive then being direct.

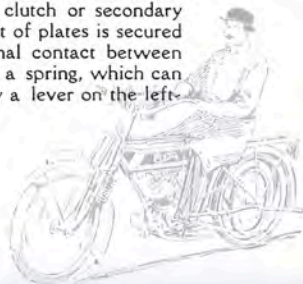
This description possibly reads rather complicated, but if carefully followed with the illustrations there will be no difficulty in obtaining a correct understanding of the function of the various parts.





CLUTCH.

This is of the multiple disc type, very similar to the one on our Standard 5/6 H.P. Model; as a matter of fact the plates are of the same size, but there are, of course, not so many used. One set is secured to the clutch drum, revolving with the clutch or secondary gear shaft. The other set of plates is secured to the pulley, and frictional contact between the two sets, obtained by a spring, which can be put out of operation by a lever on the left-hand handle-bar.



SILENCER.

The exhaust gases pass from the cylinder through the exhaust pipe into a large silencer; and from this the outlet is by means of a long pipe which opens into the atmosphere at the rear of the machine. This is in accordance with modern car and high-class motor cycle practice, and makes the machine exceedingly quiet.

LUBRICATION.

The oil for lubricating the piston, piston rings, gudgeon pin bearing, cylinder walls, large end connecting rod, and the roller bearing on the one side of the crank shaft, is conveyed to the engine by being mixed with the petrol, and by being taken through the carburettor with the fuel. This system is perfectly satisfactory and is being adopted by many of the makers of the smaller two-stroke Motor Cycles. The tank contains two compartments, a small one on the front for oil, the main compartment being for the mixture of petrol and oil ready for use. Connected to the oil compartment is a hand operated pump, so proportioned and designed that when one gallon of petrol is poured into the tank through the back filler cap, five full charges from this pump conveys exactly the right amount of lubricant from the oil compartment to the petrol compartment. The large phosphor bronze bush in which the crank shaft revolves is lubricated from the gear case, which is provided with a special opening on the fly wheel side. Fitted to this outlet is a plug which must be taken out and good engine oil (not grease) filled in until it starts to run out at



the plug hole; the plug should then be replaced and screwed up tight. This will lubricate all the shafts, shaft-bearings, and gears. Every 300 miles the plug should be taken out and any lost oil should be replaced, while occasionally it would be wise to drain out the old oil and fill up with clean.

CONTROLS.

These are as follows:—

1. Carburettor control fixed on the right-hand handle-bar, two levers, top air, bottom gas.
2. Underneath the same handle-bar grip is an inverted lever for the front rim brake.
3. On the left, immediately below the left-hand handle-bar grip, an inverted lever, which operates the clutch by means of Bowden mechanism.
4. Just in front of this lever and underneath the bar is the small trigger which controls the compression release.
5. The magneto advance lever is on the left-hand side of the tank.
6. The gate change and gear control is situated on the right of the tank, and has three positions—the central notch (0) being for neutral, and giving a free engine, the front one (1) being the low gear position, and the back notch (2) being the top gear position.



7. The rear brake is operated by a pedal on the left-hand side of the machine, immediately above the footboard.

FRAME.

As will be seen from the illustrations this is very strong and of the loop type. The tube from the front head-lug right underneath the engine to the saddle pin-lug is one piece, the whole of the members of the frame being, of course, weldless steel tubes. The spring forks are of the well-known Druid pattern, while swing-up stands are fitted to both front and back wheels. The carrier is of steel weldless tube. The brackets for carrying the tank are brazed to the frame on the lower horizontal tube, the tank thus being supported from underneath and not swung from the top tube.

TANK.

Strong and well-made. Capacity, $1\frac{1}{4}$ gallons of fuel, $2\frac{1}{2}$ pints of lubricating oil.

TRANSMISSION.

$\frac{3}{4}$ Lycó rubber belt, large size pulley on the power unit (6 in. in diameter) 20 in. belt rim.

CARBURETTOR.

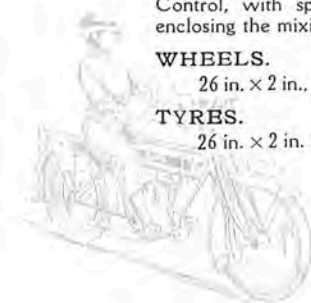
Clyno A.M.A.C. Two-lever Handle-bar Control, with special hot-air jacket, totally enclosing the mixing chamber.

WHEELS.

26 in. \times 2 in., Standard Motor Cycle Rims.

TYRES.

26 in. \times 2 in. Hutchinson Brooklands



BRAKES.

Rear Brake with fibre shoe, which operates on belt rim. (NOTE:—No brake fittings or connections have to be removed to take out the back wheel). Bowden front rim brake.

FOOTBOARDS.

Footboards have been fitted in preference to rests, as these are much more comfortable and convenient than is the case when merely a round rod or pedal supports the foot.

SADDLE.

Lycett's La Grande Saddle, No. L110. Anti-vibratory model, springs being in constant tension. Low riding seat.

TOOL BAG.

Pannier bag, enclosed in metal case, fixed to right-hand side of carrier.

TOOLS.

Tool Roll containing the following:—Adjustable spanner, one double-ended spanner, three tyre levers, screw driver, pin punch, lamp spanner.

NUMBER PLATES.

One on front mudguard and one on carrier.

ACCESSORIES.

Lucas Lamp No. 341, black finish; Lucas Cyclorn, No. 60, black finish; Reflex Light, Lamp Burner Cleaner, Tyre Inflator, Tyre Repair Outfit, Oil Can.

WEIGHT.

130 lbs. (approx.)



FINISH.

The best everywhere. The enamelling is of special Clyno silver grey, lined blue. Tank, grey with blue panels, lined gold. Hubs and spokes of wheels all enamelled, also the rims, except a narrow portion which is left plated for the front brake.

PRICE.

£40, complete, ready for the road as specified.

STARTING.

Although no starter is fitted, the Clyno Light-weight can be started without pushing and jumping into the saddle in the old way. There are two much better methods. The one is:—

By running alongside with the low gear in, and as soon as the engine has started, declutching by means of the hand lever on the handle-bar, allowing the engine to run, and getting into the saddle while the machine is stationary, and then letting the clutch in. This is, of course, the easiest way, but starting may be also effected by sitting in the saddle and paddling, *i.e.*, pushing off with each foot alternatively.

AN EXPERT'S OPINION.

"Anyone who had ridden a pedal cycle would be able to ride straight away through traffic on this lightweight (the Clyno 2½ h.p. Two-Stroke machine)."

See Motor Cycling, 24th March, 1914, page 649.



In the 1914 Paris-Nice Trial Mr. Hugh Gibson riding a Clyno Light weight, as illustrated above, was awarded the following:

1. GOLD MEDAL.
2. SPECIAL PRIZE, for smallest successful machine, given by Touring Club of France.
3. SPECIAL PRIZE in the 350 c.c. Class for flexibility, given by Messrs. The Vacuum Oil Co.

Gentlemen,

I should like to put on record my appreciation of the splendid manner in which the Clyno Light-weight carried me through the 800 miles of the Paris-Nice Trial. I had not the slightest trouble of any description.

At the finish the machine was running much better than at the start and, in my opinion, this improvement by running in will be much more marked in the Two-stroke machine than in the Four-stroke, which commences to deteriorate after 250 miles. This, together with the fact that there are no valves to stick, push rods or tozzles to break, nothing to seize up and no friction makes the small Two-stroke machine ideal and practically fool-proof.

A very noticeable feature during the ride was the remarkable steadiness of the new model.

Yours truly,
HUGH GIBSON.



SINGLE-SPEED MODEL.

Price - - - £30

The specification of this machine is exactly the same as the two-speed gear model, with the exception of the following :—Single Gear—Direct Drive.

No Clutch is fitted

No Lamp, Horn, or Rear Reflector Light are included, and there is no Aluminium Shield for the External Fly Wheel.

Apart from the above differences, the single gear model is almost identical with the two-speed gear machine.

PRICE LIST OF SPARE PARTS.

Ref. No.	Name of Part.	Price
		s. d.
1203.	Piston Ring	1 6
1264.	Piston	12 6
1332.	Joint Washer for Transfer Cover ..	0 9
1334.	Joint Washer for Exhaust and Inlet Manifold	0 9
1295.	Sparking Plug	5 0
1545.	Sparking Plug Joint Washer	0 1
1286.	Compression Release Valve Spring ..	0 2
1413.	3/4 in. Rubber Lycro Belt	12 3
1414.	Belt Fastener	0 9
1415.	Filler Cap for Oil or Petrol Tank ..	1 0
1386.	Main Spring for Spring Forks	1 9
1442.	Rear Brake Block	0 9
1252.	Clutch Push Rod	0 6



Ref. No.	Name of Part.	Price
		s. d.
1298.	Clutch Lever Adjusting Screw	0 5
1300.	Nut for ditto	0 1
762.	Inner Clutch Plate	0 6
761.	Outer Clutch Plate	0 6

EXTRAS.

		s. d.
TT	Handle-bars	3 6
	Dunlop Tyres, 26in. by 2in. each	7 6
XL	All Light-weight Saddles	5 0
XL	All Model A Saddles	8 6

SUNDRIES.

		s. d.
	Assortment of Pins, Nuts and Washers	2 0
	Sparking Plug	5 0
	Belt Fastener	0 9
	Tin of Price's Huile-de-Luxe Engine Oil	2 9
	Tin of Price's Amber Gear Oil	1 0
	Tin of Clyno Clutch Oil	0 10

TERMS.

Railway Transit. All goods are delivered free on rail at Wolverhampton station in good condition and signed for as being so by the railway companies, who then become the agents of the purchaser, the latter paying all charges for carriage, etc. Customers should therefore carefully examine machines when received, and if damaged should sign accordingly, and make an immediate claim upon the carriers.

Packing. Crates are charged at 4/- each, not returnable. Export Case, 12/-

Repairs and Sundries. These cannot be booked, our terms being net cash on receipt of *pro forma* invoice. Machines or parts for repair must be sent carriage paid, and the name of the sender attached, or they cannot be received.

The Company reserves the right to alter any Specifications, Illustrations, and Prices in this Catalogue at any time without notice.



GUARANTEE.

We guarantee, subject to the conditions mentioned below, that all precautions which are usual and reasonable have been taken by us to secure excellence of materials and workmanship, but this guarantee is to extend and to be in force for three months only from the date of purchase, and damages for which we make ourselves responsible under this guarantee, are limited to the replacement of any part which may have proved defective. We undertake, subject to the conditions mentioned below, to make good at any time within three months any defects in these respects.

As Motor Cycles are easily liable to derangement by neglect or misuse, this guarantee does not apply to defects caused by wear and tear, misuse or neglect.

If a defective part should be found in our Motor Cycle, or in any part replaced, it must be sent to us carriage paid, and accompanied by an intimation from the sender that he desires to have it repaired free of charge under our guarantee, and he must also furnish us at the same time with the number of the machine, the name of the agent from whom it was purchased, and the date of the purchase, or the date when the alleged defective part was replaced as the case may be.

Failing compliance with the above, no notice will be taken of anything which may arrive, but such articles will lie here at the risk of the senders, and this guarantee and any implied guarantee shall not be enforceable.

We guarantee only those machines which are bought either direct from us or from one of our duly authorised agents, and under no other conditions.

We do not guarantee the specialities of other firms, such as tyres, saddles, belts, lamps, etc., or any component part supplied to the order of the purchaser, differing from our standard specification supplied with our Motor Cycles, or otherwise.

The Term "Agent"

is used in a complimentary sense only, and those firms whom we style our Agents are not authorised to advertise, incur any debts, or transact any business whatsoever on our account, other than the sale of goods which they may purchase from us; nor are they authorised to give any warranty or make any representation on our behalf other than those contained in our guarantee.