

## Details of the Clement-Garrard Motor—continued.

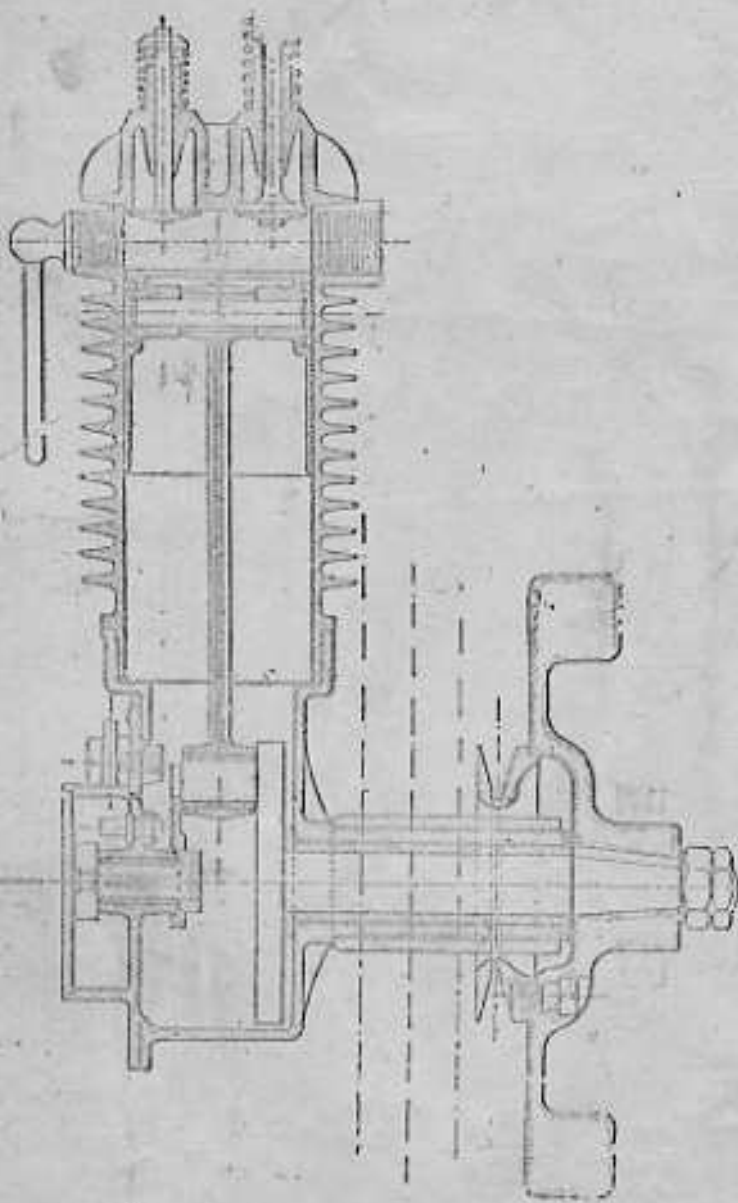


Fig. 9.

**Section  
Long Bearing.  
No Internal  
Screws or Nuts.**

**All Nuts in  
Sight.**

**Wrist Pin.**

The connecting rod is a solid steel forging. The wrist pin is simply placed in position and the piston rings put on. There are three of these, two small or narrow ones, and one wide one. This latter covers the ends of the wrist pin, thus ensuring that it will not come out and scrape the cylinder walls.

It is a question of assembling A.B.C. to disassemble Z.Y.X.

**Exhaust Valve  
Lifter.**

Fig. 9 is an elevation in section. One of the many unique features to call attention to is the *very long Main Bearing*, measuring  $5\frac{1}{2}$  inches.

It will be remarked that there are no screws, pins, nuts, or anything whatsoever in the assembling of the internal parts. The proper sequence must be observed to get the parts together, and then when the nuts on the crank case and cylinder cover bolts are screwed home, they remain there in full view, and the rider knows for absolute certainty nothing can possibly go wrong inside.

Fig. 10 is a side elevation, showing the crank case cover screws, and the exhaust valve lifter. This is connected on to the same hand lever as the advance spark rocker.

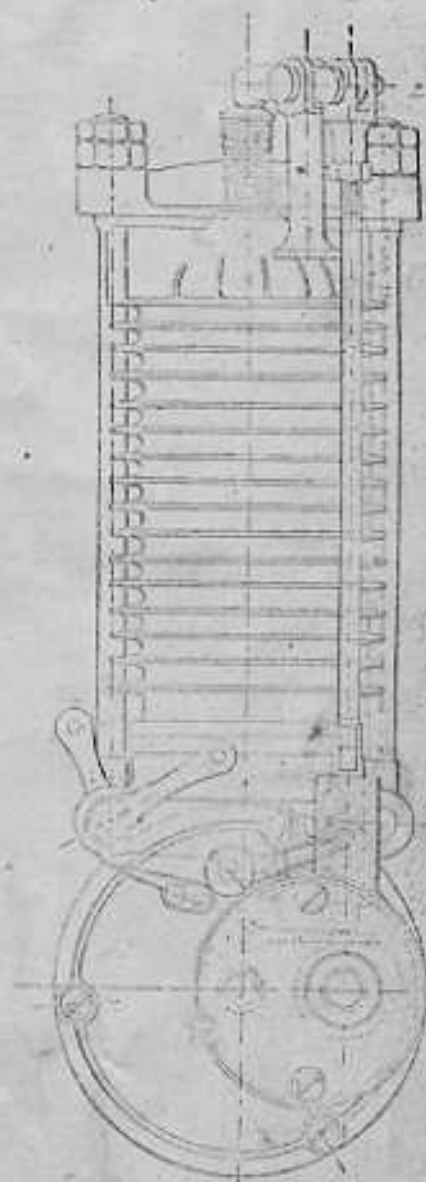


Fig. 10.

## Details of the Clement-Garrard Motor—continued.

**Cylinder Cover.** Fig. 11 is a "plan" view of the cylinder cover No. 401, showing the "exhaust valve striker No. 415" and the "assembling cross piece No. 422."

**Ground Joint.** The cover is fitted with a ground surface joint. We have never heard of a leak, but should this ever require re-grinding in, both sparking and viewing plugs must be screwed home while the grinding is done, or an infinitesimal elasticity in the metal when the plugs are screwed in would spoil the joint. Be extremely careful to remove every vestige of emery before assembling.

**Crank Chamber.** Fig. 12 is part section of "crank chamber No. 433" and "crank case No. 444," showing the 2 to 1 gear bushes Nos. 445 and 446. The screw thread seen to the right of the fig. is for the "contact breaker" plate to screw on.

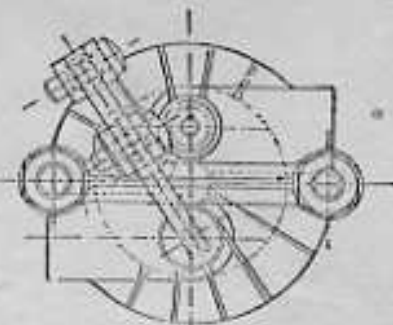


Fig. 11.

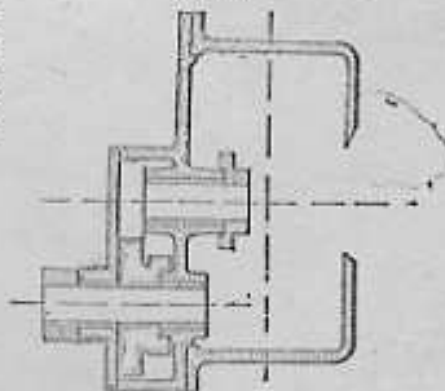


Fig. 12.

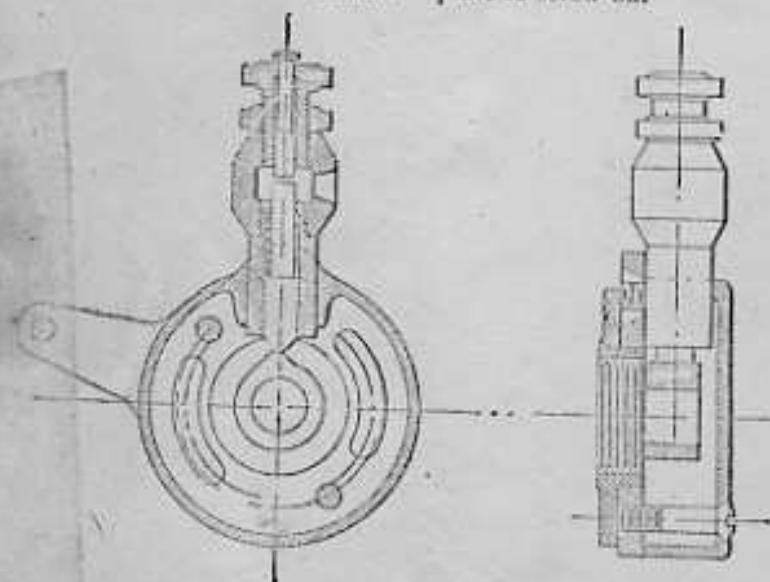


Fig. 13.

### Contact Breaker.

Fig. 13 is an illustration of the Garrard-Maxfield Contact Breaker, ready to be fitted to Cam Shaft.

This form of contact breaker has been specially designed to overcome the faults found in the majority of these devices.

- 1st. It will be noticed the platinum points are enclosed in a separate insulated chamber, thus ensuring no dirty oil getting at the points while the cam itself is well lubricated.
- 2nd. Arcing at break. This trouble is overcome by the very sharp and positive break given at the contact. This is done by the bottom plunger being on its downward stroke along with the top plunger. The top plunger is suddenly arrested by a positive stop, while the bottom one is still in motion ensuring the sharpest possible hammer break.
- 3rd. Wearing of Platinum. The platinum points in this contact breaker have a direct action against one another, while in the trembler blade type the trouble is, one side of the platinum always wears away first. This is due to the varying angles which the spring blade takes up when pushed up against the platinum tipped screw by the cam. A wipe contact and trembler coil can be fitted if required.
- 4th. Voltage. With this contact it is possible to use a 2-volt accumulator instead of the usual 4-volts generally employed. The reason of this is that the whole of the flat surface of platinum is always in contact at once, not one corner at first, gradually meeting all over, and the reverse when the break takes place.

**Lubrication.** This is effected by means of a force pump fitted inside the back tank, or on the left hand side of frame tank.

The correct lubricant is an oil of a similar character to Price's Medium Gas Engine Oil. The usual Motor oil supplied is too heavy and viscous for these high-speed engines.

## Details of the Clement-Garrard Motor—continued.

We mix a special oil called "Garrard's High Speed Oil," which can be used not only through the pump but by mixing with the petrol. This was discovered by one of our staff, and after a number of experiments with various oils and mixtures, the above oil was decided on. The proportion of High Speed Oil to petrol is 1 to 10.

It is necessary to supplement this method of lubrication by oiling in the usual way, but only a quarter of the usual quantity is required.

This lubrication can only be done with a spray carburettor.

It is always better to over lubricate than go to the other extreme. The correct amount of lubrication is easily found after a little experience.

Lubrication can be done from the saddle. It is obviously advisable to occasionally empty the crank case of the waste or spent oil, by means of tap or plug at bottom of crank case and wash out with paraffin.

### Accumulators.

We supply two 2-volt cells with all these motors, so that there is always one cell in reserve. These cells are each of 15 ampere hours capacity, and each should last 400 to 500 miles before requiring recharging.

When charged the cells should show 2.4 volts each, and should be recharged when the voltage falls to 1.8

Do not let the cells stand long when discharged, as this is the chief cause of the plates sulphating.

A good accumulator should hold its full charge for twelve months.

### Positive.

The brass screw on the Positive Pole of any accumulator tends to corrode, the negative one does not. The positive pole is generally coloured red.

### Charging.

It is always the better way to recharge accumulators from an electric light installation with direct current. (The alternating current is of no use for this purpose.)

The correct way to do this is to get three 16-c.p. lamps mounted on a board along with a small switch, then connect the accumulators up in series with the 3 lamps placed in parallel. When connecting up, test the voltage before the current is switched on, then test again. If the voltage falls, the accumulator is connected up to the wrong poles. This can be rectified by changing the wires over.

It is then advisable to mark the wires with the (+) positive and (-) negative marks.

The accumulator should be charged until it shows 2.6 volts while charging, and 2.4 when disconnected.

If charged in any other manner, care must be taken that the charging is not done too quickly. That is to say at not a greater rate than  $1\frac{1}{2}$  amps.

The cost of charging a C. G. cell at Electric Light Stations is usually half that of other accumulators.

### Electrical Connections.

#### Low Tension.

The end marked Positive goes to the Terminal marked Positive (+) on the coil. The lead from the negative terminal (-) of the Accumulator goes to the Contact Plug Block. From there the continuation of the same line goes to the Switch handle (or any other device that may be used) through the said switch to the Handlebar which is usually termed the "Mass." The Terminal marked T on the coil goes to the "Trembler" or Contact breaker. The completion of the Low Tension Circuit is from the handle bar to the cam in the Contact breaker through the "Mass."

Care should be taken when clamping engine to frame, that the enamel is cleaned away at some part beneath the clip, so that good metallic contact is ensured for the low tension circuit, or a piece of covered cable from any part of engine to handle-bar clip.

#### High Tension.

M on the coil should be connected to the positive terminal on same end of the coil. The single terminal end of coil must be connected by the special thick insulated wire to the sparking plug.

#### Sparking Plug.

The single end of the coil connects straight to the Sparking Plug with the thick insulated cable. Be careful to screw small nut up tightly when attaching wire.

NOTE.—The wiring is always correct on a machine despatched from the Works. It is therefore advisable to make a careful note, for future reference, of the attachment of each wire.

## Notes on Driving, Kit, &c.

**Starting.**—Have I turned on petrole, put in contact-plug after "opening" handle switch? Is my inlet valve free? If engine is stiff have I oiled or petrolled the piston through the plug? Almost every driver has left undone one or more of these things at some time and pedalled lots for his lapses.

**Carburettor.**—In the larger chamber there is a cork float having a stem with a conical valve on it. When this is just right, the proper level is maintained, when too light, motor is weak at slow speeds, but fully effective when at high speeds. When too heavy the petrole will leak by dripping through the second chamber. In the second chamber is the spraying tube, with a very fine hole through it; should it be suspected that this is somewhat stopped up, the bottom hexagon plug may be withdrawn and a fine wire passed up through the fine hole.

**Handles.**—The forward handle serves the double functions of advancing the spark and also propping open the exhaust valve. Of the rear pair, the right hand is the "throttle" which operates on the mixture just the same as the "regulator" on a steam engine. The left handle operates on the strength of the mixture or may be called the mixture variator.

**Light Running.**—It is clear that a motor that will run up a steep incline has generally more power than need be expended in a good proportion of the journey, therefore we run what locomotive drivers call "linked up;" we throttle up rather fine, get the mixture on the weak side, but still keep the spark well advanced, the motor will purr contentedly at a fine rate of speed and keep splendidly cool, then when the hill comes we have a motor in fine form to crowd on full throttle and feel for the best mixture.

**2-speed Gear.**—With the 2-speed Gear, however, we can often let the Motor run right over the hill throttled and cut down, by dropping the gear down and going a little more slowly.

**Electrical.**—When stopping *always* remove the Contact Plug, and thus avoid running down your electrical energy by accident or meddling.

**Valves.**—These should not be touched (beyond passing a little petrole through for cleaning) unless there is a loss of compression.

**Flywheel.**—If this should ever be taken off, great care must be taken to screw up the two nuts thoroughly tight, or the Key in the Flywheel will be destroyed and perhaps damage the boss on the Flywheel.

**Kit.**—Riders are recommended to make a "checking list" of their own; most aggravating stoppages can thus be avoided. One's attention is often absorbed by the Motor Kit, and the Cycle Kit gets forgotten.

**Cycle.**—Pump, Repair-Outfit, Spanners, Oil Can, Cape, Map, Coupling Pin and Nut for Chain.

**Motor.**—Petrole Address Book, Glass Paper or Emery-cloth, spare Sparking Plug, spare Belt Hooks, Pill Box of Resin, Small Voltmetre, Special Motor Spanner, or a Movable Spanner to take largest nuts, Turn-screw, Pocket Knife, and a Pair of Pliers.

**Belt Driving.**—The belt must be *supple*. When nothing better is available, soaking in castor oil is good, but it is argued that castor oil is ultimately somewhat destructive to the leather; but since our belts are low in cost, they disregard this. A better material is belt dubbin. We can send tin boxes of this. The belt will then draw well when quite slack. If a belt gets covered in dirt, mud, metallic rubbings, &c., the best way to remove these is to untwist it (if a twisted belt) and scrub it with hot soap powder and rain water, let it get nearly dry and dress it again with dubbin immediately. If caught in a very severe rain storm use castor oil and resin for the emergency, and that as soon as possible. It will take you through anything. Should a twisted belt show a tendency to jump over the side of the belt pulley, unhook it and reverse it, if this does not cure it, untwist the belt and reverse the twisting.

**Heating.**—The C.-G. Motor is well within the size where air cooling is successful, it does not overheat at the low gear, and suspicion of overheating can be dealt with by placing the "mixture" rather at a shade too weak than otherwise, it is when too strong that overheating takes place, and a falling off in power also.

# The "Garrard"

## Two-speed Gear, Chain Drive, and Combined Belt and Chain Drive.



**T**HE ideal drive for a Motor Cycle is certainly by means of a chain but this method has not proved satisfactory when used direct in the ordinary way owing to the effect of the Shock communicated to the rider, the injury done to the engine, and the extra wear on the tyres, through the positive drive.

In designing our chain drive we had these disadvantages before us, and we therefore incorporated a two-speed gear working on a countershaft, in which a compensating device takes up the shock of the explosion.

The two-speed gear is a modification of the Sun and Planet gearing, and gives on the low gear a Free Engine, that is, on the low gear the bicycle can be propelled by the pedals without driving the engine or through the engine.

The advantages of this arrangement are obvious, as on descending long hills, the engine is stopped and efficiently cooled.

The change of gear is effected by a band acting upon a drum connected with the gear, and worked by a lever fixed on the tank.

The method of starting up the Motor Cycle is as follows:—

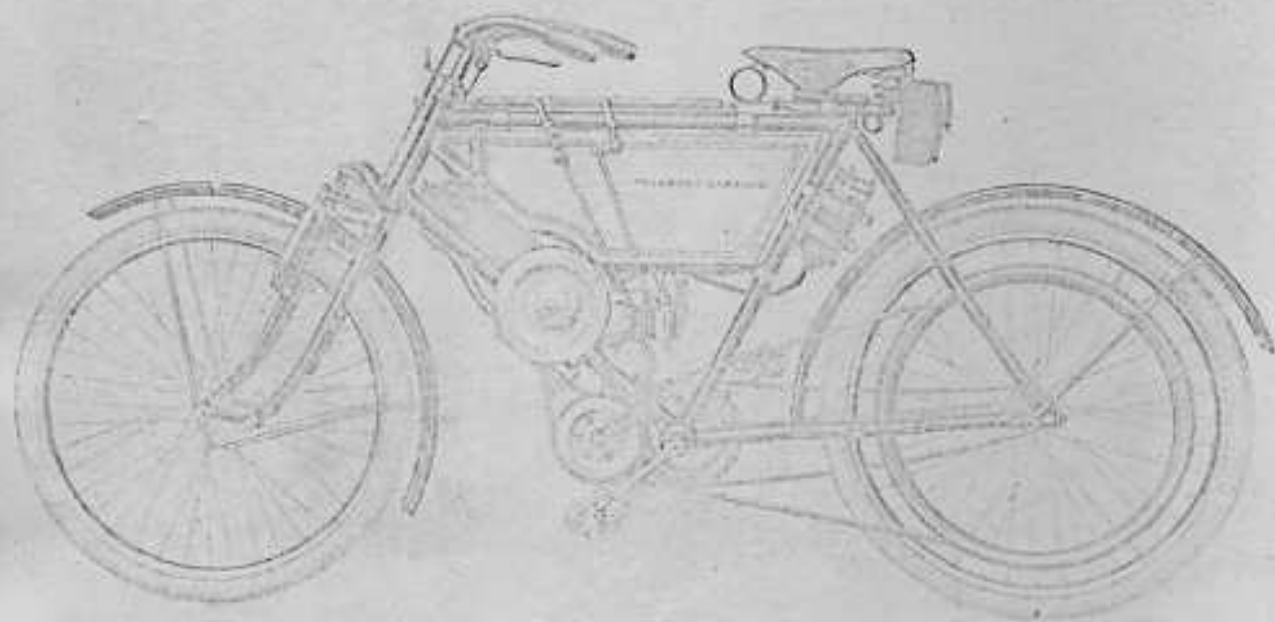
The lever of the two-speed gear is pulled back as far as it will come, the machine being mounted and propelled like an ordinary cycle. When the rider is comfortably seated and has a little impetus on the machine, push the lever right forward. This causes the flywheel of engine to turn round, and the rider closes his exhaust and advances the spark by pushing front right hand lever forward. Under the impulse of the engine the gear drum slips and allows the engine to kick from high to low gear, the shock of the impulse being absorbed by the slipping of the drum inside the band.

- |                 |   |
|-----------------|---|
| Low Gear.       | When the engine is running smoothly, pull the gear lever back to the first or starting position, and keep it there until the speed is fourteen or fifteen miles an hour.  |
| High Gear.      | If faster pace is required push the gear lever forward, which immediately brings the high gear into operation.  |
| Ratios of Gear. | The gear is so arranged as to give a difference of 25%, or a ratio of 6 to 1 and 8 to 1. The difference between the gears always remains the same, but the ratio can be arranged according to the district to be ridden or the work to be done.           |
| Combined Drive. | At the request of a number of our friends we are now making a combination of chain and belt drive in conjunction with the two-speed gear. In this type a chain is used between the engine and two-speed gear, and a belt between the gear and back wheel. |

# The Garrard Suspended Fork.

Reg. No. 416237.

Solves the Vibration Problem in an entirely  
satisfactory manner.



The chief objection to Spring Forks has been the rolling of the wheel due to each side being independent of the other.

The Garrard Suspended Fork is constructed in such a manner that there is no lateral strain at all, and the hub spindle is always at a true right-angle to the fork sides.

## Unsurpassed for Hill Climbing and Economy.

WE have pleasure in giving a few of the successes and distinctions obtained with the "Clement-Garrard" Motor.

### Hill Climbing

Semmering, near Vienna, 10,000 metres with a rise of 400 metres.		
Time, 14 mins. 24 $\frac{1}{2}$ secs.	-	1st Prize
Laffrey Hill Climb	-	1st Prize
La Turbie Hill Climbing Contest	-	1st Prize
Mont Ventoux Hill Climb	-	1st Prize
Gaillon Hill Climb	-	1st Prize
Chateau Thierry Hill Climb	-	1st Prize <i>Record for Motor under 50 kilos.</i>
Cote de Huy Hill Climb	-	1st Prize
Rose Hill, near Birmingham	-	1st Prize

### Economy.

Paris Criterium de Consommation (Economy Contest), 1st, 2nd, 4th, 5th and 6th Prizes. All on the 55 $\frac{1}{2}$  m engine.  
Lyons Economy Trials, 1st.

### Reliability.

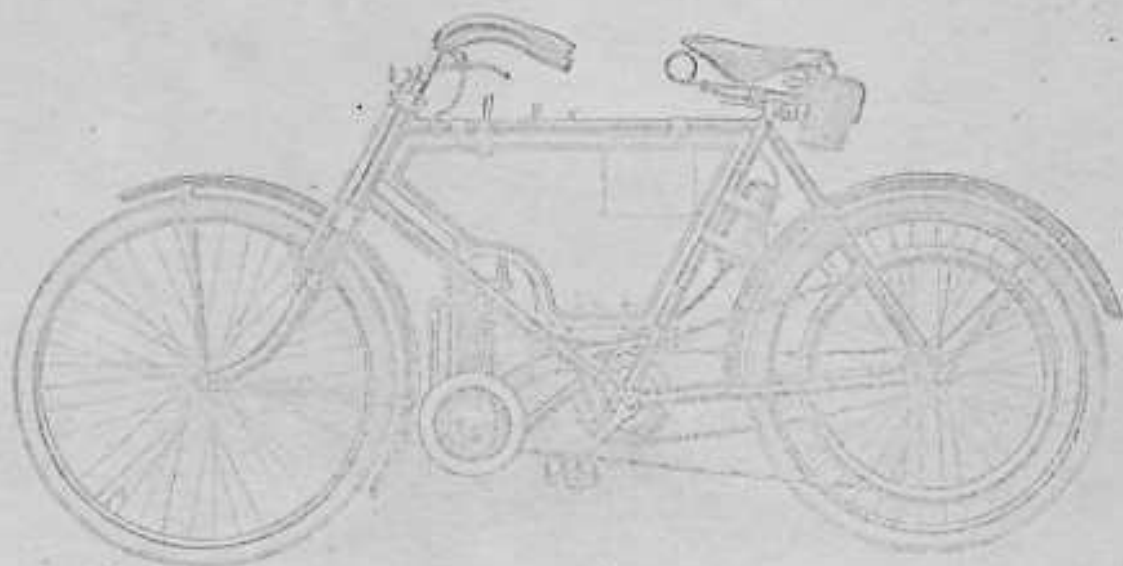
Paris-Rome Record, 1,800 Kilometres in Mid Winter. This was done on the 55 $\frac{1}{2}$  m engine.  
Circuit des Ardennes, 1st Prize.  
Circuit du Nord (Paris to Arras), 1st Prize.

### Speed.

Nice 1 Kilometre and 1-Mile World's Record.  
Parc des Princes 100 Kilometres for Motors under 30 Kilos, 1st and 2nd Prize.  
Plymouth 5 Miles International, 1st Prize.  
Do. 5 " Scratch, beating Rigal on 8 h.p. Motor.  
Birmingham Charity Sports, 5 Miles, 1st and 2nd, with Featherweight Motors, doing over 33 $\frac{1}{2}$  miles an hour.  
Ostend, Flying Kilometre. *Record, 36 $\frac{1}{2}$  secs.*  
New York (Empire City Track), 5-Mile *American Record.*  
Canning Town, *World's Record* 1 Mile.  
Do. International 3 Miles, 1st Prize.  
Do. International 5 Miles, 1st Prize.  
Deauville, 500 Metres, 1st Prize.  
Phoenix Park, Dublin, Speed Trials, 1st Prize.

**The Clement-Garrard**  
**Featherweight Motor Cycle.**  
**Paris-Rome Vertical Model.**

**Price: 29 GUINEAS.**



**SPECIFICATION.**

**Clement-Garrard Engine,** 55 m/m bore,  
60 m/m stroke.

**Carburettor**—Improved surface.

**Coil**—High-speed Trembler.

**Drive**—Belt.

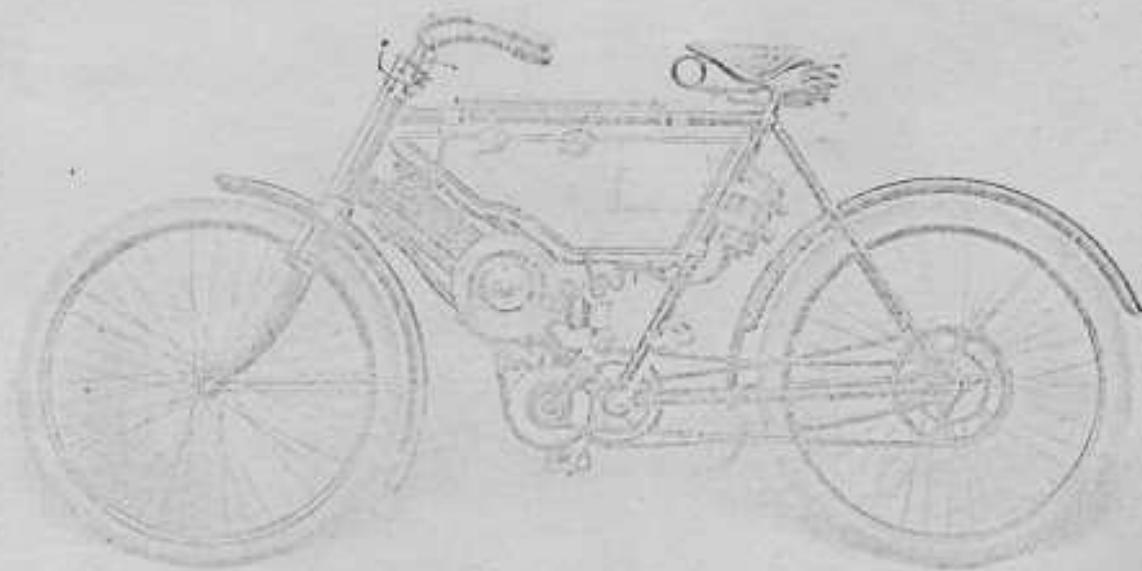
**Frame**—Special design, 23 in.

**Tyres**—1 $\frac{1}{4}$  in. Clincher.



# Clement-Garrard

## Featherweight Motor Cycle.



### SPECIFICATION.

- Engine— $1\frac{1}{2}$  h.p.: bore 55 m/m, stroke 60 m/m. 143 c.c.  
 Carburettor—Float feed spray.  
 Ignition—Garrard-Maxfield high speed.  
 Frame—Special design 23 in.  
 Tyres—2 in. Clincher, 25 in. wheels.  
 Petrol Capacity—Cylindrical tank at back of saddle, containing sufficient petrol for 75 to 100 miles. Separate compartment for lubricating oil, with pump.  
 Frame Tank Capacity—200 miles.  
 Weight—72 lbs. to 79 lbs.  
 Drive—Belt, or two-speed chain drive.

PRICE—Belt Drive, Cylindrical or Frame Tank - - £33 0 0

Two-speed Chain Drive, Cylindrical or Frame  
 Tank - - - - - £42 0 0

Garrard Suspended Forks, extra, £1 15s. 0d.

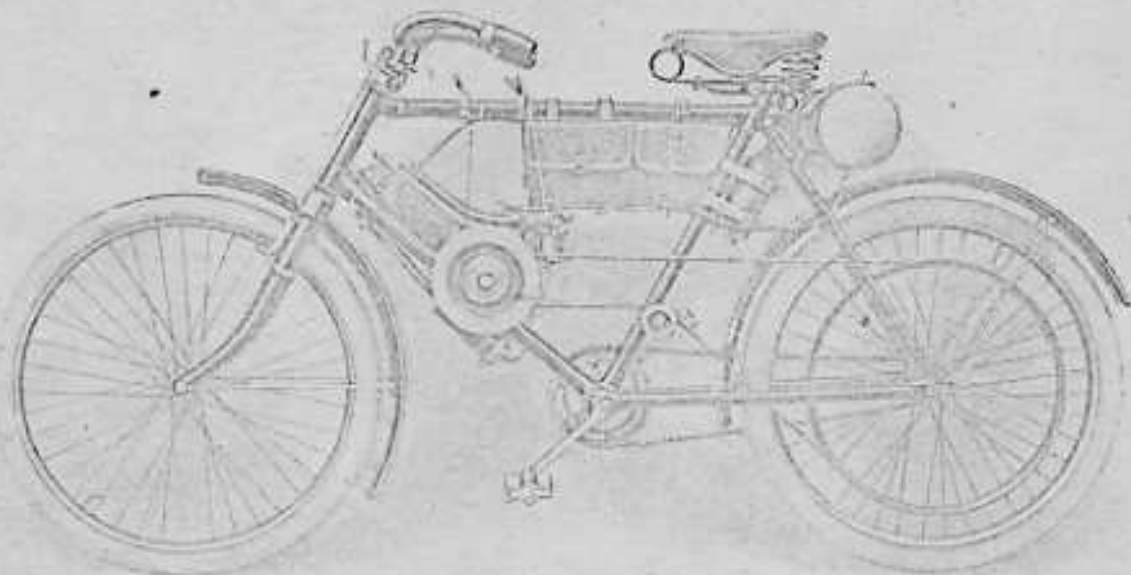
Motor Sets complete, £23, Belt Drive. £4 extra for Two-speed Chain Drive.

The Cycling Editor of "The Queen" (Dec. 6th) says:—

"REALLY GOOD.—The only firm who seem to have got the reduction of weight on the Garrard Company of Birmingham, who showed a plain diamond frame bicycle fitted with the 143-c.c. 1½ h.p. Clement-Garrard motor. This is a very light, which I was able to test pretty thoroughly a month ago, when the little motor, pushing in a simple yet very ingenious manner, without the weight and difficulty of starting involved with a fly engine. The chain drive does away with the slipping and breaking of the belt, and the control of the two-speed gear by a friction band intercepts the ticks of the engine when starting."

# Clement-Garrard

## 2-h.p. Motor Cycle.



### SPECIFICATION.

Engine—2 h.p.; bore 60 m/m, stroke 70 m/m. *198 cc*

Carburettor—Float-feed spray.

Ignition—Garrard-Masfield high speed.

Frame—Special design 23 in. extra strong

Tyres—26 in. by 2 in. Clincher.

Petrol Capacity—Cylindrical tank at back of saddle containing sufficient petrol for 75 to 100 miles. Separate compartment for lubricating oil, with pump. A frame tank can be fitted if required.

Drive—Belt, or two-speed chain drive.

Weight—75 to 84 lbs.

PRICE—Belt Drive, Cylindrical or Frame Tank - £40 0 0

Two-speed Combined Chain and Belt Drive - £44 0 0

Garrard Suspended Forks, extra £1 15s. 0d.

Motor Sets with all parts complete, £25, Belt Drive.

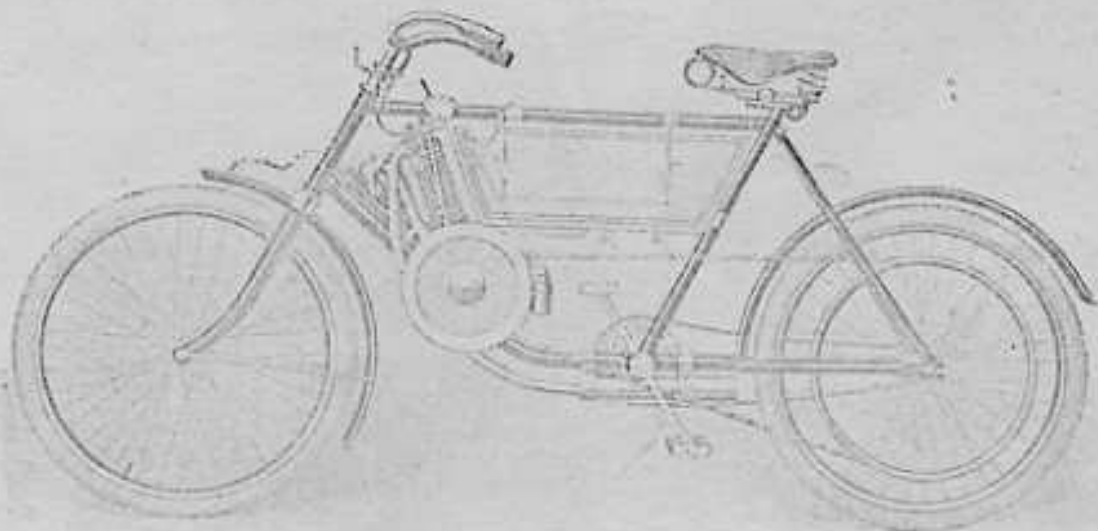
February 12th, 1903.

DEAR SIR—I reached Marnouth, which is 40 miles, in three hours twenty minutes on my Clement-Garrard motor. I consider the new (Gibson) Garrard-Masfield a great improvement especially on hills.—GEO. WEBB.

Manager, GASBROW CYCLE CO., LTD.

# Clement-Garrard

## Twin Cylinder Motor Cycle.



### SPECIFICATION.

Engine—3 h.p. Twin Cylinder; bore of each 55 m/m, stroke 70 m/m.

Carburettor—Float feed spray.

Ignition—Double Garrard-Maxfield high speed, or wipe contact and trembler coils.

Frame—22 in. or 24 in. special design, extra strong

Wheels—26 in.

Tyres—Palmer motor cycle, 2 in.

Petrol Capacity—Frame tank contains sufficient petrol for 75 miles.

Drive—Belt.

Weight—110 lbs.

PRICE of Motor Cycle - - - - - £57 0 0

Garrard Suspended Forks, extra, £1 15s. 0d. Twin Cylinder Motor Sets, £35.

BANGOR.

10th September, 1907.

DEAR SIR.—The Clement-Garrard has earned a unique distinction in my experience. It has never once failed to start right off, whether after a forty mile or a hundred yards; whether it has been all night in a road shed or resting five minutes on the kerb. Considering I've been on it, off and on, for seven days continuously, I think it's about record in our motor experience, not have I had the slightest trouble except a back wheel puncture.—Yours, etc., J. G.

# Press and Various Opinions.

## From "The Queen."

"With the Two-speed Motor Gear fitted to the 2-h. p. Clement-Garrard engine this motor is well up to trailer work, and will tackle any reasonable hill with ease, while the very long wheel base gives steady and easy running. The capabilities of this engine are surprising."

## From the Technical Editor of "The Motor."

"My little 'Clement-Garrard' motor is still running fine; the power and efficiency of the little thing is *marvellous*. It dashes up hills in fine style, sometimes it seems so powerful that it is all I can do to keep the speed down."

"Have given up riding my ordinary machine and come to business every day on the 'C. G.' motor, I can rely upon it to such an extent; how is that for motor bicycles coming to stay?"

"Yours faithfully,

"B. A. HUNT."

## From "The Clarion."

"I have now the smartest little motor-cycle that ever I have thrown myself across. It is a feather-weight compared with the ordinary machine, and if it only keeps going like it goes just now I shall be satisfied. I received it from the railway station, and without any trials, I took some petrol on board, gave her a preliminary run, set the levers, and, heigho! she was off, and never stopped until home was reached, thirty miles away. Up-hill she goes better than ever I have been taken before, but then the machine complete is not over 70lb. as against the 120lb. of the ordinary motor-cycle. This is the 'Clement-Garrard.' Neat and smart-looking. The engine parts come from France, and are built up at the Garrard Manufacturing Co.'s premises in Birmingham. The cycle is fitted with a Moderatum free wheel and coaster hub and Crabbe front brake. The wheels are shod with 28in. by 1 7/16. Clincher motor-cycle tyres. By simply throwing the strap loose from the pulley wheel the cycle can easily be pedalled at nine or ten miles an hour. I have tried this to-day, although I have not needed manual power yet. She is a dandy."

"If any man wishes to test the merits of a motor-driven vehicle, let him take it around Lancashire territory—Bury, Bolton, Ramsbottom, Chorley, Rawtenstall, etc. These are the journeys to test the merits of your car or cycle. Abominable stretches of roadways, hill-climbing extraordinary, shocks and bumps and hair-raising escapades—these all come in as a matter of course. There are times when it is manifestly impossible to drive a cycle at all. My switches shook on or off on scores of occasions, and often it was policy to take off the engine altogether. Now I know what some of our Clarion Clubs have to put up with when they take their club runs. As a testing-ground for my feather-weight motor cycle it was great, and nothing came adrift but a broken wire from a terminal. Such an awkward break, too, hidden by the outer casing, and hard to locate. I soon found a Bury copper-smith to put it right again, and it cost me 2d. Now I would take my Clement-Garrard anywhere."

## The S.G. Co., Birmingham, say, October 6th, 1903.

"I am writing you to say how very pleased I am with the 1 1/2 h.p. Clement-Garrard. After eighteen months' hard wear it gives the utmost satisfaction and is better than when I first rode it. I have reached considerably over 30 miles per hour and that even with my son on a second saddle fixed over the back wheel like a tandem."

## R. W. Woodforde, writing in the "Motor," May 20th, 1903.

"Some readers were asking for the cost of running a motor a few weeks ago. My 1 1/2 H.P. Clement-Garrard runs 22 miles on a pint of petrol or about 75 miles a gallon. Cost about 12 miles a penny; lubricating oil 20 miles a penny. Speed about 20 miles an hour. This little engine will pull a trailer and passenger at about 13 or 14 miles an hour (average) with gas tap nearly closed. My engine has just run its 1,000 miles and gives no trouble."

## A. Strawson, Louth, 11th July, 1903.

"The engine set is highly satisfactory. I can do 10 miles in 40 minutes, which I think very good for a small machine."

**From J. H. Williams, Birkenhead.**

"Now that I have given the little Clement-Garrard motor what I consider sufficient use to be able to offer an opinion on it, I have great pleasure in saying that it has given every satisfaction. The engine is certainly more efficient than I expected, and as far as speed is concerned, I have found this motor considerably faster than others of greater size and h.p. As to design and workmanship I consider there is nothing to beat the C.-G. motor."

**From F.E.B., Clayton, nr. Manchester, 15th August, 1903.**

"I have ridden the Clement-Garrard 2-h.p. motor for over 500 miles and I have not had the slightest trouble with it. It has climbed all the hills it has come to without assistance and is very fast on the level."

"I ran from here to Morecambe and back on one gallon of petrol."

**From South of England Cycle Co., Southsea, 28th July, 1903.**

"The engines we have had have given universal satisfaction, in fact the writer has tried most makes, but the 2-h.p. Clement-Garrard knocks spots off anything we have tried."

**From T. W. Fawns, Brechin, 2nd May, 1903.**

"Many thanks for your letter of 30th ult. I have made the alteration you suggest. I can now get any speed from 6 to 35 or 40 miles an hour. I have had trials of a few styles of motor cycles, but I would not exchange my Clement-Garrard for any of them."

**From B.G., His Majesty's Theatre, London, 27th Sept., 1903.**

"During the season I have been riding one of your 2-h.p. two-speed motor bicycles, and I am more than pleased with the magnificent work it will do. Lately I have fitted a fore-carriage to it and it pushes the entire entourage along without a protest at a speed satisfying to any but the extreme speed-seeker. I must compliment you on the grand work put into it."

**From J. S. Atkinson, Scarborough, 15th Sept., 1903.**

"I take the opportunity to inform you that my Clement-Garrard motor cycle is giving me every satisfaction, and that I find the two-speed gear and chain-drive has greatly improved the machine."

**From J. Hatcher, East Ham, 7th July, 1903.**

"I have two of the 1 1/2-h.p. motors, and I must say that they are the best little motors for general work, especially when one has to go amongst the traffic of London."

**From H.L.C., South Wales, 27th July, 1903.**

"I have now run 1,000 miles with a forecar, with passenger weighing 150lbs. and the last 400 miles with 80lbs. of luggage on the machine in addition. This is the 2-h.p. motor I had from you some time ago."

**From H. Gordon Tidey, 3, Pentonville Road, London, N.,  
June 16th, 1903.**

"Whilst writing permit me to congratulate you on your 1 1/2-h.p. machine. I had no experience of motor cycles before, but your little machine seems equal to anything, and I have not had the slightest trouble with it."



**Bristol, June 29th, 1903.**

"I have had my 1 1/2-h.p. Clement-Garrard motor a year to-day, so I thought you would be interested to hear how I have got on with it. During the year I have ridden over 7,000 miles on it, and it is now going as well as ever it did. During the last few weeks I have done some stiffer hill climbs with it than ever before. Although my weight is about 12 1/2 stone I find it will take me without puffing up hills that are too much for most of the 2-h.p. machines one sees about here. It is also thoroughly capable of drawing a trailer with an adult passenger on any ordinary main roads. My last run with the trailer was one of 60 miles and there was only one hill for which it was necessary to dismount, and that was a very steep one with a danger board."

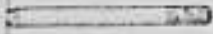
















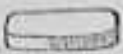
**From R. Windram, Esq., of Birmingham.**

"I have travelled over 4,000 miles on it, on all kinds and conditions of roads without the slightest trouble, thus showing the excellence of material and workmanship."










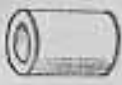








## Interchangeable Parts for the Clement-Garrard Motors.

	No. of Piece	No. of Pieces per set	Paris Rome Model 1½ h.p.	Phoenix Pack Model 2 h.p.	Twin Cyl. Model M 3 h.p.	ENGLISH NAME	FRENCH NAME
	401	2	24/-	27/-	32/-	Cylinder Head	Culasse
	402	1	1/3	1/7	—	Inlet Elbow Connection	Pipe d'aspiration
	403	1	1/3	1/7	—	Exhaust Elbow Connection	Pipe de refoulement
	404	2	4d.	4d.	—	Elbow Nuts	Ecrous de pipe
	405	1	2/6	3/3	4/-	Inlet Valve	Clapet d'aspiration
	406	1	3d.	3d.	4d.	Inlet Valve Spring	Ressort du clapet d'aspiration
	407	1	4d.	4d.	5d.	Inlet Valve Cap	Calotte de clapet d'aspiration
	408	1	2d.	2d.	2d.	Inlet Valve Cotter	Clavette de Calotte de clapet d'aspiration
	409	1	3/3	4/-	5/-	Exhaust Valve	Clapet d'échappement
	410	1	4d.	4d.	4d.	Exhaust Valve Spring	Ressort du Clapet d'échappement
	411	1	4d.	4d.	5d.	Exhaust Valve Cap	Calotte du Clapet d'échappement
	412	1	2d.	2d.	2d.	Exhaust Valve Pin Cotter	Goupille de la calotte
	413	1	2/6	2/6	3/3	Exhaust Valve Striker Supports	Support du culbuteur
	414	1	2d.	2d.	2d.	Exhaust Valve Striker Support fixing screw	Vis de fixation du Support du culbuteur
	415	1	1/7	1/7	3/3	Exhaust Valve Striker	Culbuteur
	416	1	3d.	3d.	3d.	Striker Pin	Axe du Culbuteur
	417	1	8d.	8d.	10d.	Eye for Striker	Chape du Culbuteur
	418	1	3d.	3d.	3d.	Striker Eye Pin	Axe de chape de Culbuteur

# Changeable Parts of the Clement-Garrard Motors.






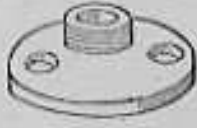



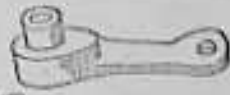








	No. of Pieces	Pieces per Set	Paris Course Model 1 1/2 h.p.	Paris Park Model 2 h.p.	Twinn Cylinder Model 3 h.p.	ENGLISH NAME	FRENCH NAME
	419	1	7d.	10d.	1/2	Striker Eye Rod	Tige de chape de culbuteur
	420	1	2d.	2d.	2d.	Lock Nut for Striker Eye Rod	Contreécrou de tige de culbuteur
	421	2	6d. doz.	6d. doz.	6d. doz.	Split Pin for Striker Pin	Goupille fendue pour axe de culbuteur
	422	1	3/3	3/3	4/-	Assembling Cross Piece	Bride d'assemblage
	423	1	16/-	19/6	25/6	Cylinder	Cylindre
	424	1	1/9	1/9	1/9	Cylinder Plug	Bouchon de décompression
	425	1	3d.	3d.	3d.	Handle for Cylinder Plug	Manette du bouchon de décompression
	426	1	13/-	16/-	23/-	Piston	Piston
	427	2	1/2 each	1/7 each	2/- each	Narrow Piston Rings	Segments étroits
	428	1	1/7	2/6	3/-	Wide Piston Ring	Segment large
	429	1	7d.	10d.	1/3	Wrist Pin	Axe du piston
	430	1	7/3	9/6	12/-	Connecting Rod	Bielle
	431	1	10d.	1/-	1/-	Bronze Bush for large connecting rod end	Douille en bronze pour tête de bielle
	432	1	8d.	10d.	1/-	Bronze Bush for small connecting rod end	Douille en bronze pour pied de bielle
	433	1	29/-	41/6	56/-	Crank Chamber	Carter
	434	1	5/6	5/6	8/-	Crank Case Bush	Bague du carter
	435	1	22/6	35/-	48/-	Crank Axle	Arbre manivelle
	436	1	6d.	6d.	10d.	Crank Shaft Feather (or key)	Clavette

# Interchangeable Parts of the Clement-Garrard Motors.

















	No. of Piece	No. of Pieces per Set	Paris Rome Model 1 1/2 h.p.	Phoenix Park Model 2-h.p.	Twin Cylinder Model 3-h.p.	ENGLISH NAME	FRENCH NAME
	437	1 écrou et contre-écrou	2d.	2d.	2d.	Nut and Lock-nut	Écrou et contre-écrou
	438	2	9d.	9d.	9d.	Oiling and Washing-out Plug	Bouchon graisseur et de vidange
	439	1	3d.	3d.	3d.	Connecting Bolt Plain Axle	Axe de colonne d'assemblage
	440	1	4d.	4d.	4d.	Connecting Bolt Hollow Axle	Axe de colonne d'assemblage (percé sur toute la longueur)
	441	2	1/-	1/7	2/6	Connecting Bolts	Colonnes d'assemblage
	442	2	2d.	2d.	2d.	Connecting Bolt Nuts	Écrous de colonnes d'assemblage
	443	2	2d.	2d.	2d.	Connecting Bolt Lock-nuts	Contre-écrou de colonnes d'assemblage
	444	1	13/-	24/-	29/-	Crank Case Cover	Couvercle du carter
	445	1	1/7	1/7	1/7	Exhaust Cam Bronze Bush	Douille en bronze du pignon came
	446	1	1/7	1/7	1/7	16-tooth Pinion Bronze Bush	Douille en bronze du pignon de 16 dents
	447	1	1/7	1/7	1/7	Exhaust Valve Lifting Socket Bronze Bush	Douille en bronze du poussoir
	448	1	3d.	3d.	—	Lifting Socket Lever Axle	Axe du levier du poussoir
	449	1	2/6	2/6	2/6	Lifting Socket Lever	Levier de poussoir
	450	1	2/3	3/3	5/-	Compression Lever	Levier de décompression
	451	1	4d.	4d.	4d.	Compression Lever Small Spring	Petit ressort du levier de décompression
	452	1	4d.	4d.	4d.	Compression Lever Small Spring Axle	Axe du ressort du levier de décompression
	453	1	2d.	2d.	2d.	Compression Lever Small Spring Stop	Axe butée du ressort du levier de décompression
	454	1	1/7	2/6	3/3	Exhaust Valve Lifting Socket	Poussoir





















## Interchangeable Parts for the Clement-Garrard Motors.

	No. of piece	No. of Pieces per Set	Paris Rome Model 1-h.p.	Phoenix Park Model 2-h.p.	Twin Cylinder Model 3-h.p.	ENGLISH NAME	FRENCH NAME
	455	2t	6/6	6/6	6/6	Exhaust Cam	Pignon came 32 dents
	455 bis	1	1/-	1/2	1/7	Exhaust Cam Axle	Axe du Pignon came
	456	1	3/3	3/3	3/3	16-tooth Pinion	Petit Pignon de 16 dents
	457	1	4/-	4/-	5/6	Exhaust Valve Gear Carrier	Remorque de distribution
	458	1	2d.	2d.	2d.	Carrier Pin	Goupille de la remorque
	459	1	3/3	3/3	5/-	Exhaust Valve Gear Cover	Plateau de distribution
	460	1	6d.	6d.	6d.	Exhaust Valve Gear Cover Bronze Bush	Douille en Bronze du plateau de distribution
	461	2	1d.	1d.	1d.	Exhaust Valve Gear Covers Fixing Screws	Vis fixant le plateau de distribution
	462	3	1d.	1d.	1d.	Crank Case Cover Fixing Screws	Vis fixant couvercle de carter
	463	1	4/9	4/9	4/9	Compression Cam	Levier came de décompression
	464	1	2/6	3/3	3/3	Compression Cam Lever	Billette de commande
	465	1	10d.	10d.	10d.	Sparking Cam	Came d'allumage
	466	1	2d.	2d.	2d.	Sparking Cam Pin	Goupille de la came d'allumage
	467	1	19/-	19/-	29/-	Fly Wheel	Volant
	468	1	4/6	6/6	9/6	Grooved Pulley	Poulie à gorge
	469	4	1d.	1d.	1d.	Grooved Pulley Fixing Screws on the Flywheel	Vis de fixation de la poulie sur le volant
	470	1	5/6	8/-	11/6	Double Fixing Clip	Collier double d'attache du moteur sur la bicyclette
	471	4	2d.	3d.	4d.	Fixing Screws for Double Fixing Clip	Vis de serrage du collier double










# Interchangeable Parts for the Glement-Garrard Motors.

	No. of Piece	No. of Pieces per Set	Parts Rome Model 1 1/2-h.p.	Phoenix Park Model 2-h.p.	Twin Clvin'er Model 3-h.p.	ENGLISH NAME	FRENCH NAME
	472	2	4d.	8d.	10d.	Fixing Bolts for Double Fixing Clip	Boulon de serrage du collier double
	473	20				Distance Pieces	Plots
	474	20	9/6 per set	9/6 per set	9/6 per set	Small Spokes	Petit rayons
	475	20				Nipples	Ecrous de rayons
	476	1	7d.	7d.	7d.	Male Union	Raccords
	477	1	7d.	7d.	7d.	Union Nut	Ecrous de raccords
	478	1	3/3	3/3	3/3	Clip for Two Levers	Collier arriere 2 manettes
	479	1	2/6	2/6	2/6	Clip for One Lever	Collier avant 1 manette
	480	4	1d.	1d.	1d.	Clip Fixing Screw	Vis de serrage des colliers
	481	3	1/3	1/3	1/3	Regulation Levers	Manettes
	482	3	1d.	1d.	1d.	Regulating Lever Fixing Screws	Vis de serrage des manettes
	483	3	1d.	1d.	1d.	Regulating Levers "D" Washers	Rondelles des manettes
	484	3	6d.	6d.	6d.	Male Union Nuts	Ecrous de raccords
	487	1	10d.	1/2	1/7	Sparking Advance Rod	Tirant
	488	2	6d. doz.	6d. doz.	6d. doz.	Split Pin for Advance Rod	Goupille du tirant
	489	1	4d.	4d.	4d.	Decompression Lever Axle Screw	Vis axe du levier de decompression

Parts for the Clement-Garrard Motors.

No. of Pieces	No. of Pieces per Set	Paris Rome Model 1 1/2 h.p.	Phoenix Park Model 2 h.p.	Twin Cylinder Model 3 h.p.	ENGLISH NAME	FRENCH NAME
	490	1	—	—	Front Petrol Tank; fixed part	Pièce d'attache du réservoir sur les tubes arrière; (fixé)
	491	1	—	—	Front Petrol Tank; loose part	Pièce d'attache du réservoir sur les tubes arrière; (mobile)
	492	1	1/2	1/2	Crank Shaft Adjusting Ring	Bague entrecroise du volant et du carter
	493	1	1/2	1/2	Jockey Pulley Axle	Axe du tendeur
	494	1	2d.	2d.	Fixing Nut	Ecrou de serrage
	495	1	2d.	2d.	Fixing Nut	Ecrou de serrage
	496	1	1d.	1d.	Washer	Rondelle
	497	1	2/6	2/6	Jockey Pulley	Poulie à gorge
	498	2	1/2	1/2	Jockey Pulley Clip	Bride d'attache du tendeur sur la bicyclette
	499	1	3d.	3d.	Jockey Pulley Cone	Cône du tendeur
	500	5	4d.	4d.	Stud for Tank Clip	Goujon fixant les plaques d'attache du réservoir
	501	1	4d.	4d.	Carburettor Fixing Bolt	Boulon fixant le carburateur sur le collier double
	502	1	2d.	2d.	Nut for fixing Bolt	Ecrou
	503	1	2d.	2d.	Lock Nut	Contre-écrou
	504	6	—	—	Stud for Front Tank	Goujon fixant les plaques du réservoir
	505	12	—	—	Nut for Front Tank	Ecrou de goujon
	506	1	3/3	3/3	Contact Breaker Brass Plate	Plaque d'allumeur
	507	1	1/2	1/2	Square Connection	Borne carrée

Interchangeable Parts for the Clement-Garrard Motors.

	No. of Piece	No. of Pieces per Set	Parts Name Model 2 1/2-h.p.	Parts Name Model 4-h.p.	Parts Name Model 5-h.p.	English Name	French Name
	508	1	4/9	5/9	5/9	Platinum Screw	Vis de platine
	509	1	6d.	6d.	6d.	Platinum Screw Lock-nut	Vis avec de vis réglage
	510	1	8d.	8d.	1/3	Connection Fixing Screw	Vis d'attache de borne
	511	1	5d.	5d.	1/4	Vibrator Fixing Screw	Vis fixation de trembleur
	512	1	1/3	1/3	4	Vibrator	Trembleur
	513	2	10.	10.	50.	Fibre Washers	Rondelles fibre
	514	1	6d.	6d.	10d.	Fibre Plate	Plaque fibre
	515	1	3/4	3/4	1/2	Contact Breaker Cover	Couvercle allumeur
	516	1	3d.	3d.	2d.	Nut for Contact Cover Breaker	Veron du couvercle
	517	1	2/5	2/5	2/5	Sparking Plug	Bougie
	518	1	40/-	40/-	77/-	Coil with Clips	Bobine avec clips
	519	1	10/-	10/-	10/-	Accumulator	Accumulateur
	520	1	9/0	9/0	10/0	Case for Accumulator	Enveloppe d'accumulateur
	521	1	4/-	4/-	4/-	Plug Switch	Contact-Interrupteur
	522	1	5/6	3/6	3/6	Set of Wires	Jonc de fils
	523	1	32/-	30/-	38/-	Carburettor	Carburateur
	524	1	1/6	1/6	1/6	Petrol Tube	Tube d'amenée d'essence
	525	1	3/-	6/-	9/6	Inlet Tube	Tube d'Aspiration
	526	2	6d.	6d.	6d.	Union Nuts	Ecrous de raccords
	527	1	1/-	1/-	1/-	Warming Tube	Tube réchauffe
	528	1	6d.	6d.	6d.	Union	Raccord
	529	1	8/-	13/-	19/6	Silencer	Silencieux
	530	1	2/6	2/6	2/6	Reels	Bobines
	531	6	6d.	6d.	6d.	Split Pins	Clous à vis fendus
	532	1	24/-	20/-	32/-	Petrol Tank	Réservoir à essence
	533	1	—	—	—	Stays for front fork (long) Right	Tube renfort fourche (longs) droite
		1	—	—	—	Left	gauche (longs)
		1	—	—	—	Right	droite (courts)
	534	1	—	—	—	Stays for front fork (short) Left	Tube renfort fourche (courts) gauche
		1	—	—	—	Right	droite (courts)
	535	1	4/3	6/1	8/1	Belt	Courroie