

Catalogue Barr & Stroud 1923 en anglais

Pamphlet No. 294.
Issued Nov. 1922

It's the Engine that Counts

The
BARR & STROUD
SINGLE
SLEEVE VALVE
MOTOR CYCLE
ENGINE

REGISTERED



TRADE MARK

1923 MODELS

350 c.c. 500 c.c. 1000 c.c.

The
BARR & STROUD
SINGLE
SLEEVE VALVE
MOTOR CYCLE
ENGINE

Manufactured under the Burt and M'Collum Patents

1923



MODELS

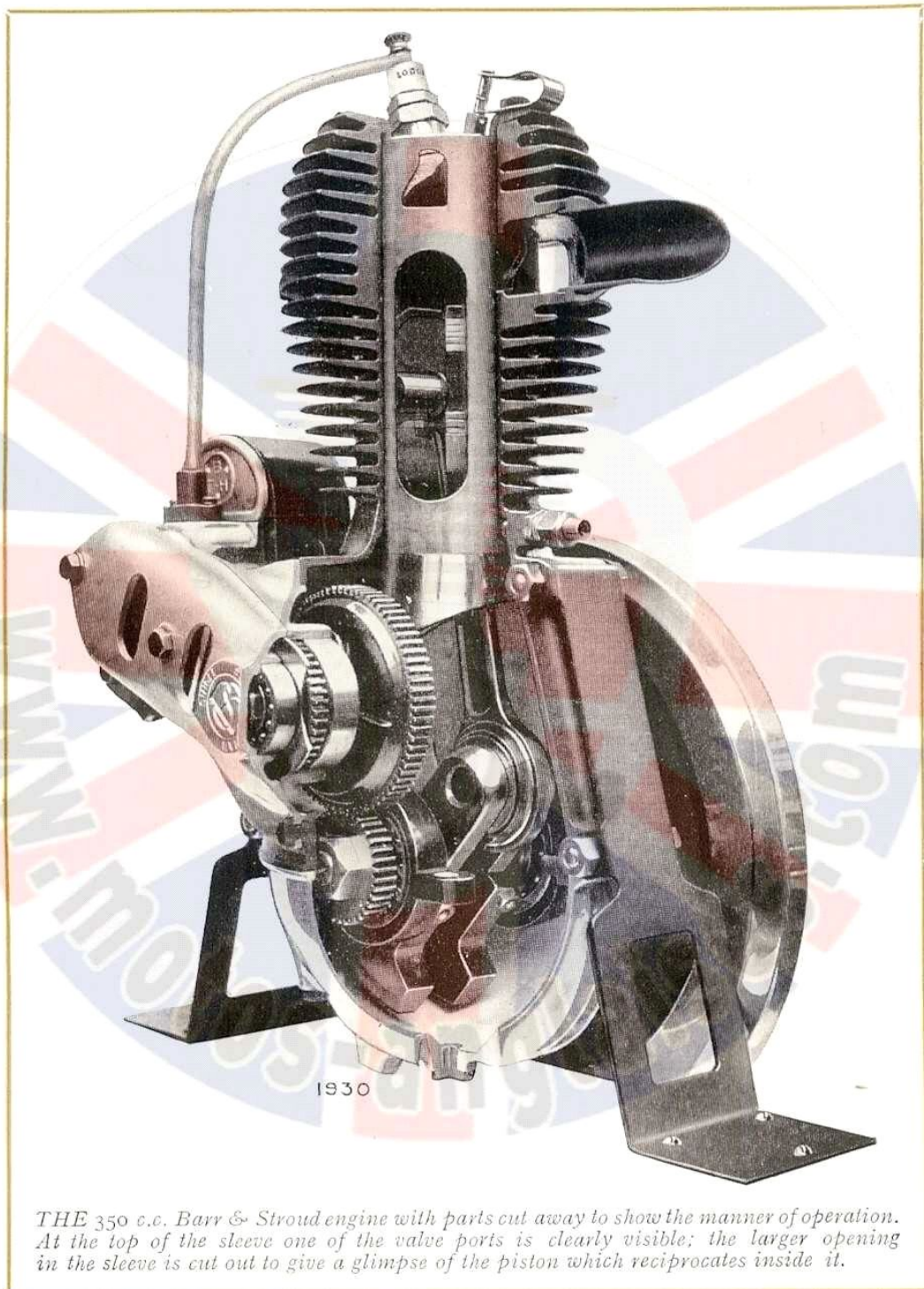
350 c.c.

500 c.c.

1000 c.c.

BARR & STROUD, LIMITED
Anniesland, Glasgow

London: 15 Victoria St., Westminster, S.W.1



THE 350 c.c. Barr & Stroud engine with parts cut away to show the manner of operation. At the top of the sleeve one of the valve ports is clearly visible; the larger opening in the sleeve is cut out to give a glimpse of the piston which reciprocates inside it.

The BARR & STROUD Single Sleeve Valve Engine

F O R E W O R D



THE repeated enquiries for Barr & Stroud Single Sleeve Valve Engines of large capacity suitable for fast solo and high-powered combination machines, have warranted the makers in marketing with every confidence two new models for the coming season, a $3\frac{1}{2}$ h.p. single and an 8 h.p. twin, in addition to their well-known $2\frac{3}{4}$ h.p. engine.

Since its introduction to the motor cycling public twelve months ago, the $2\frac{3}{4}$ h.p. (350 c.c.) Engine has made for itself an enviable name for flexibility, silence, and power output. It has now been modified in one or two minor details, as a result of experience, and the makers are confident that this engine will more than maintain its high reputation.

Some of the successes in competition work obtained during the past season by riders using the $2\frac{3}{4}$ h.p. Barr & Stroud Engine are given at the end of this pamphlet, together with a selection from the many enthusiastic letters received, and some press extracts referring to the unique qualities of this engine.

The new larger models embody several improvements and modifications in design necessitated by the heavier duty for which they are intended. In principle they are similar to the smaller engine and are manufactured with the same scrupulous care and

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

accuracy that has given the Barr & Stroud Engine a wide reputation for perfection in workmanship. It has been rightly described as "Superb."

The $3\frac{1}{2}$ h.p. (500 c.c.) Engine will meet the requirements of the rider desiring a fast solo mount. It will take a heavy sidecar anywhere and will be found to embody many features which the Poppet Valve Engine of corresponding power does not and cannot possess.

The 8 h.p. (1000 c.c.) Engine offers the maximum of luxury, refinement and power and will satisfy the desires of the most exacting owner of a heavy sidecar combination. In silence, ease of control, reliability, and cleanliness it is quite remarkable, whilst accessibility has been given the same thought and consideration which at Olympia last year resulted in the Barr & Stroud Engine being characterised as unique in this respect.

Throughout the design and production of the Barr & Stroud Single Sleeve Valve Engines, the constant aim of the manufacturers is perfection in every detail, because, after all,

It's the Engine that Counts

THE BARR & STROUD SINGLE SLEEVE VALVE
FOUR STROKE MOTOR CYCLE ENGINE

Type W.A. 6 A.

H.P. - $2\frac{3}{4}$
Bore - 70 mm.
Stroke - 90.5 mm.
Capacity 350 c.c.
Weight - 50 lbs.



Cylinder and Crank-case combined.

Cylinder Head detachable without removing carburettor or exhaust pipe connections.

Crank-case provided with readily detachable sump for cleaning and inspection purposes.

Solid Crankshaft of H.T. steel, carried on ball and roller bearings on upper half of Crank-case. The Crankshaft, Connecting Rod and Piston may be removed from engine without the latter being taken out of cycle frame.

Large External Flywheel.

Magneto housed at rear (Mark I. Engine), or in front (Mark II. Engine), as desired.

Sleeve Driving Shaft and Magneto removable as a unit without disturbing timing gears.

This Engine is intended for Light Weight Solo Machines
and Light Sidecar Combinations.

THE BARR & STROUD SINGLE SLEEVE VALVE FOUR STROKE MOTOR CYCLE ENGINE

Type W.A. 7.

H.P. - $3\frac{1}{2}$
Bore - 86 mm.
Stroke - 86 mm.
Capacity 500 c.c.
Weight - 74 lbs.



Cast Iron Cylinder secured to Aluminium Crank-case.

Cylinder Head detachable without removing carburettor or exhaust pipe connections.

Reversible Exhaust Pipe Coupling, giving alternative positions for piping.

Crank-case provided with readily detachable sump for cleaning and inspection purposes.

Built-up Crankshaft, incorporating Internal Flywheels, carried on ball and roller bearings on upper half of Crank-case; Flywheels, Connecting Rod and Piston may be removed from engine without the latter being taken out of the cycle frame.

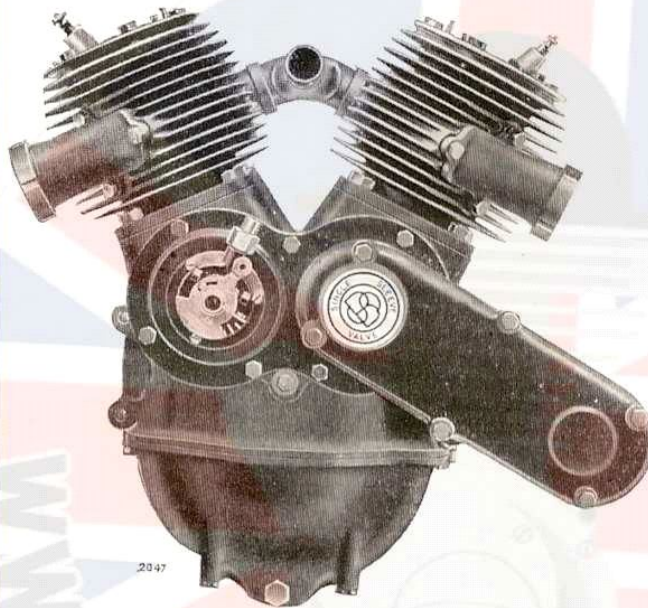
Magneto housed at rear of engine. Driven by Chain from Sleeve Shaft.

"Best & Lloyd" Mechanical Pump driven off Sleeve Shaft.

This Engine is intended for Fast Solo work in Heavy Machines or Medium Weight Sidecar Combinations.

THE BARR & STROUD SINGLE SLEEVE VALVE FOUR STROKE MOTOR CYCLE ENGINE.

Type W.A. 9.



Twin Cylinders	(50°)
H.P. -	- 8
Bore -	- 86 mm.
Stroke -	- 86 mm.
Capacity -	- 1000 c.c.
Weight -	- 100 lbs.

This Engine is similar in general design to the 3½ h.p. Engine.

Special attention has been given to the Induction Pipe design to ensure equal distribution of gas and the prevention of starvation of one Cylinder by the other.

Lubrication is by "Best & Lloyd" Mechanical Pump driven off the Rear Sleeve Shaft.

The Magneto is carried on one forward engine plate, and is chain-driven from the forward Sleeve Shaft.

This Engine is primarily intended as a luxurious Sidecar Power Unit; it will, however, be found to meet all the requirements of the rider who desires a Solo Machine having a large Engine capable of the very highest speeds for prolonged periods.

HOW THE VALVE OPERATES

IN the Barr & Stroud Engine, which operates on the well-known four-stroke cycle, the usual poppet or mushroom-headed valves, with their cams, springs and tappets, have been eliminated, and their functions are performed by a simply operated sleeve which moves within the cylinder.

The cylinder and combustion chamber have no side pockets for the valve ports, these being formed in the cylinder wall itself and opening and closing when corresponding ports in the sleeve register with them. The piston reciprocates within the sleeve, which extends throughout the whole length of the cylinder bore; but it should be clearly understood that the piston has no function in connection with the opening and closing of the ports.

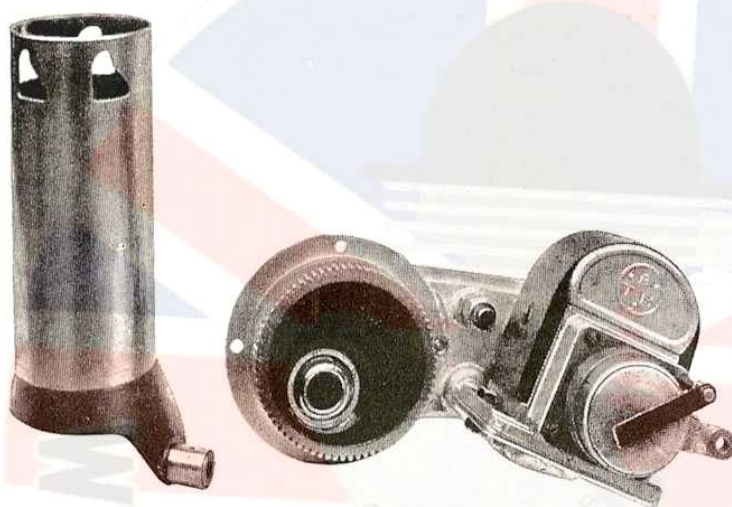
The sleeve valve is operated at half the speed of the piston and crankshaft through the agency of half-time gearing. Its motion is of a combined reciprocal and rotary nature, so that any point upon its surface describes an ellipse in completing a cycle of movement.

Six ports of a shape experimentally determined are cut in the cylinder wall, three communicating with the inlet and three with the exhaust passages cast round the cylinder. The inlet and

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

exhaust passages communicate directly with the carburettor and the exhaust pipe respectively.

The sleeve is made of a close-grained iron, and has five specially shaped ports cut in it. Two of these uncover the inlet ports in the cylinder and two the exhaust, while the fifth, which is larger in size than the others, opens an inlet and an exhaust port alternately. The sleeve is $\frac{5}{64}$ of an inch in thickness, and is ground externally and internally to a very fine finish.



Sleeve and sleeve bracket assembly of the 350 c.c. engine (including magneto), which can be detached by the removal of five set screws. The ball and socket coupling which drives the sleeve is clearly visible in the half-time wheel.

At the base the sleeve is thickened, and this part carries at right angles to the axis a pin by means of which it is driven, and as the drive is positive as regards both the opening and the closing of the ports it is obvious that there can be no variation in the valve timing at any speed or condition of use.

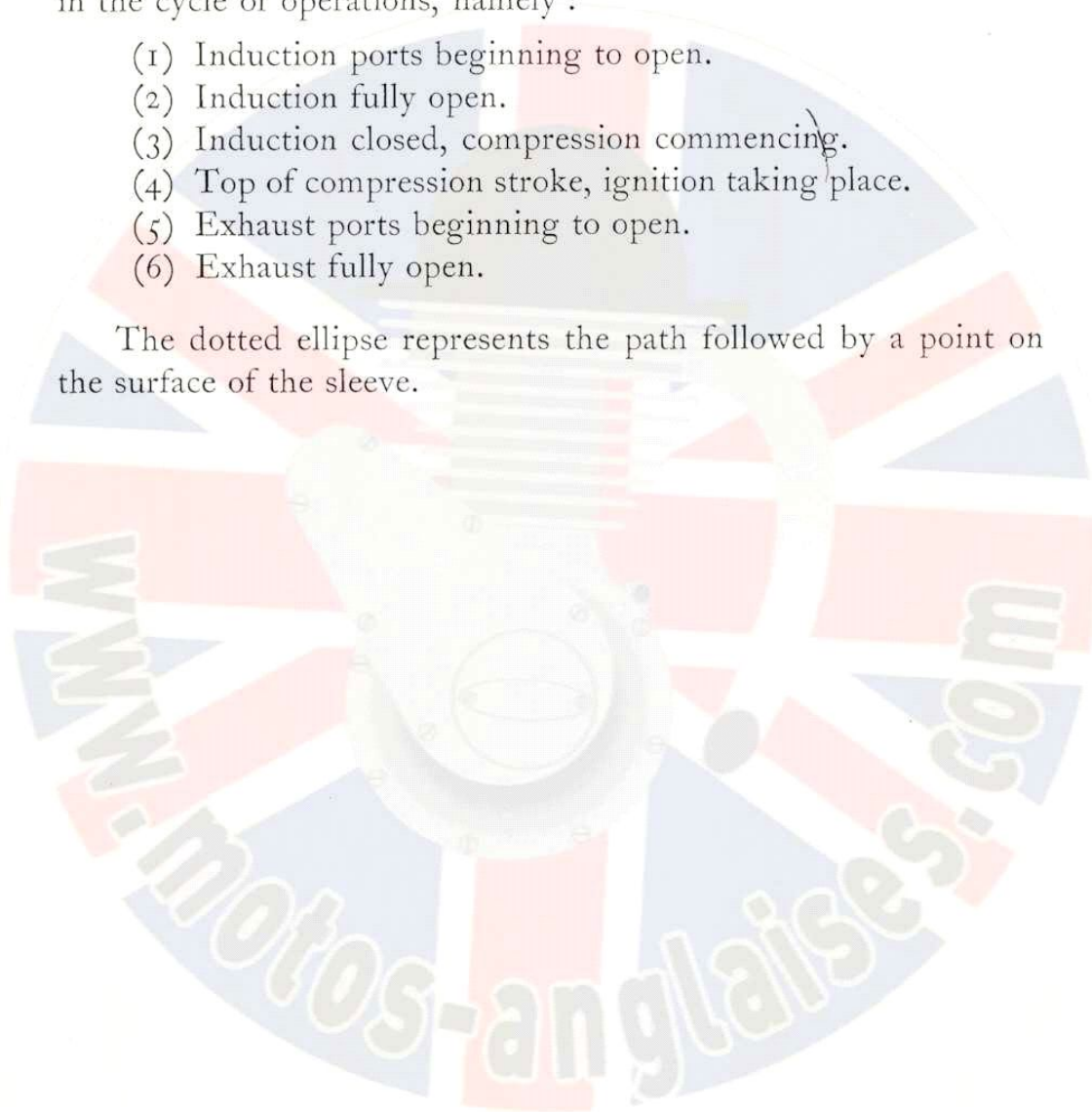
The action of the sleeve valve will be best understood by reference to the diagrams on page 11, which illustrate the relative

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

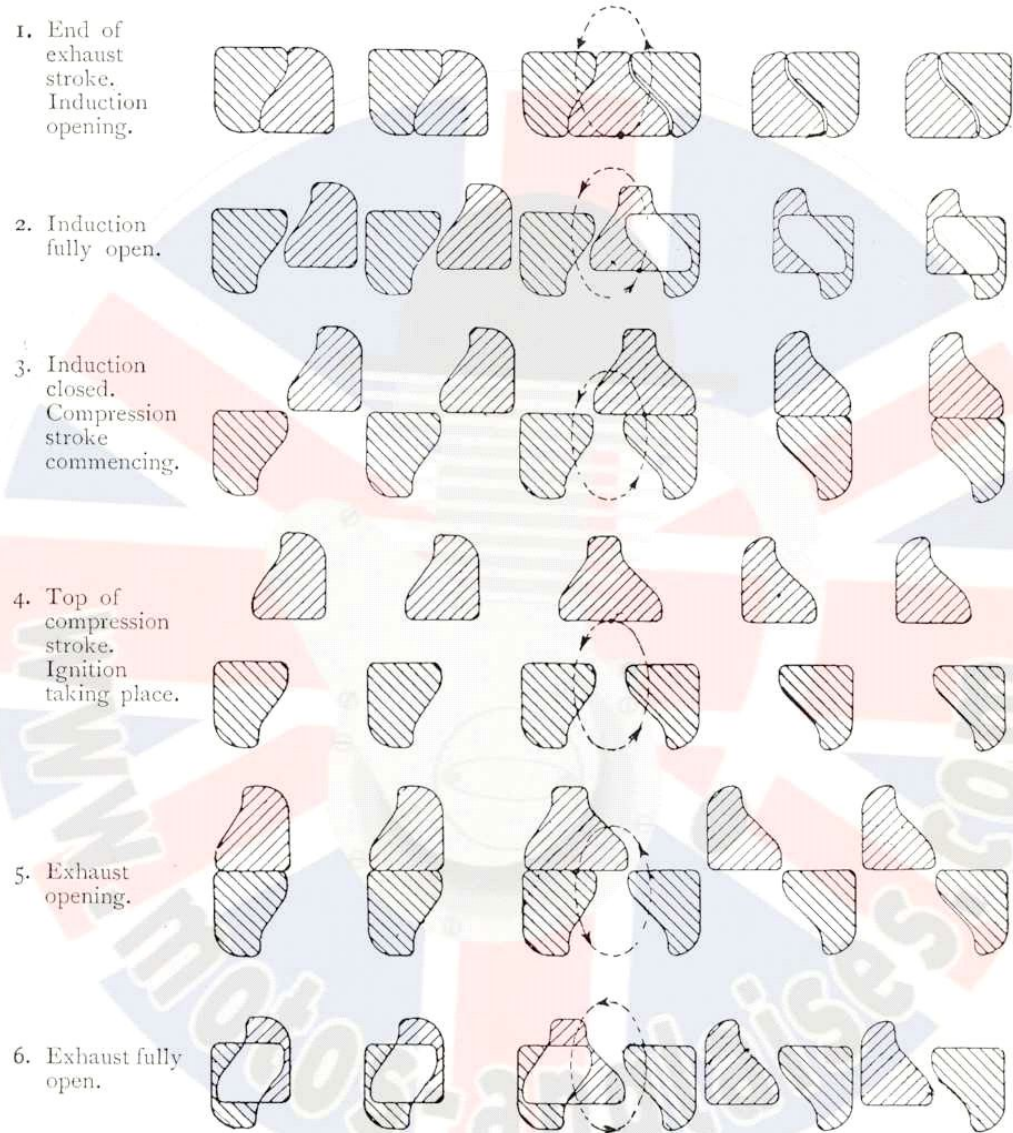
positions of the cylinder ports and the sleeve ports at six points in the cycle of operations, namely :

- (1) Induction ports beginning to open.
- (2) Induction fully open.
- (3) Induction closed, compression commencing.
- (4) Top of compression stroke, ignition taking place.
- (5) Exhaust ports beginning to open.
- (6) Exhaust fully open.

The dotted ellipse represents the path followed by a point on the surface of the sleeve.



The BARR & STROUD SINGLE SLEEVE VALVE ENGINE



////// **SLEEVE PORTS.**
 \\\\\\\ **CYLINDER PORTS.**

Port opening diagram showing the relative positions of the sleeve and cylinder ports during a complete cycle of operations.

THE ADVANTAGES OF THE SLEEVE VALVE

compared with the Poppet Valve Engine

IN the larger, water-cooled sizes, the sleeve valve engine has established a high reputation on cars, lorries, "tanks," and road and agricultural tractors, and upon such cars as the Argyll, Daimler, Mercedes, Minerva, Panhard, Piccard-Pictet and Willys-Knight, sleeve valve engines have been used with great success. The Barr & Stroud Engine is made under the same patents as the Argyll, viz. those of Messrs Burt & McCollum.

Probably the most obvious advantage which the single sleeve valve engine possesses over the poppet valve type lies in the absolute silence of the valve mechanism, but there are numerous other advantages, all of which have their own importance.

1. The combustion chamber is made as near as is practicable to that shape which is theoretically most efficient. There are no valve pockets to cause uneven expansion as the temperature rises.
2. The sparking plug is placed in the position of greatest efficiency, viz. in the centre of the cylinder head.
3. As the combustion chamber is of regular shape, radiation and cooling is equal over the whole surface.
4. The whole of the timing mechanism is enclosed and runs in oil; therefore wear is infinitesimal.
5. There are no valves to be ground in at more or less frequent intervals, no valve springs to require renewal and no tappets to adjust.

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

6. Opening and closing of the ports are both carried out by a positive mechanism which does not in any way depend upon the strength of springs which may lose their temper when exposed to heat.

7. Although the sleeve is larger and heavier than the poppet valve which it replaces, less power is absorbed in its operation than is required to raise the valves against the springs and, in the case of the poppet exhaust valve, against the compression of the exploded gases in the cylinder.

8. In the Barr & Stroud Engine the sleeve is in *continuous motion* in a closed path while the engine is running. This is advantageous not only in lessening the frictional resistance between cylinder and sleeve and between sleeve and piston, but also in distributing the lubricant evenly all over the surfaces which are in contact and in preventing the complete reversal of direction in the shearing of the oil film, which is an unavoidable characteristic of all other engines.

9. There is no possible chance of loss of efficiency due to the ingress of unwanted air into the cylinders past valve stems. This is a very common trouble in motor cycle engines where the valve stems are exposed to the dust from the roads which, with the absence of lubrication, causes rapid wear both in the valve guides and in the stems.

10. The ports can be made to open much more rapidly than poppet valves, and thus "wire-drawing" of the charge on the induction stroke at maximum engine speed is reduced to a minimum, while the position of the ports is such that a particularly high degree of gas turbulence, so essential for complete and rapid combustion

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

of the mixture, is obtained, and similarly a more complete scavenging is obtained on the exhaust stroke.

11. Far fewer parts are required in a sleeve valve than in a poppet valve engine. The sleeve alone does the work of:—

Two valves Two valve cups

Two springs Two cotter pins

and the single half-time wheel with the ball and socket coupling takes the place of:—

One or two cam wheels Two rockers

Two tappets with adjustments.

Further, in the case of overhead valves there must be added to the poppet valve engine:—

Two overhead rockers Two push rods.

This statement of the main advantages inherent in the Barr & Stroud Engine is sufficient to show that it has little to fear from its most important rival, and its excellent performances during the past season and the many enthusiastic letters received from its riders, prove that there is undoubtedly a great future before the Single Sleeve Valve Engine in the motor cycling world.

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

1922 SUCCESSES

THE FOLLOWING are some of the AWARDS gained by the 350 c.c. Barr and Stroud Engine during the year 1922 :—

Glasgow Western M.C.C. One Day Trial, Jan. 2nd

Mr. J. Donaldson (Royal Scot, with Sidecar)	-	-	First Class Award
Mr. G. Hope Wilson	-	-	First Class Award

Colmore Cup Trial, Feb. 25th

Mr. C. S. Burney (Beardmore)	-	-	-	-	-	Gold Medal
Mr. G. Oates (Edmund)	-	-	-	-	-	Silver Medal

A.C.U. Stock Trial, March 15th

Mr. J. Donaldson (Royal Scot)	-	-	-	Special Certificate of Merit
Mr. S. Warne (Beardmore)	-	-	-	First Class Certificate

Victory Cup Trial, March 18th

Mr. F. J. Price (Diamond)	-	-	-	Duke Cup and Gold Medal
Mr. C. S. Burney (Beardmore)	-	-	-	Gold Medal

West Centre A.C.U. Arctic Trial, April 1st

Mr. H. Greaves (Beardmore)	-	Special Silver Arctic Trial Medal (First Class Award)
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Glasgow Western M.C.C. Hill Climb, Sorn Hill, April 8th

Mr. A. Douglas S. Barr	-	350 c.c. General Class, Solo—First—on time
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M.C.C. London—Land's End, April 14th

Mr. A. S. Guthrie (Diamond)	-	-	-	-	Gold Medal
Mr. C. W. Lewis (Beardmore)	-	-	-	-	Gold Medal

Glasgow Western M.C.C. Two-days Easter Trial, April 15th and 17th

Mr. G. Hope Wilson (Edmund)	-	-	Hutchinson Cup and Gold Medal
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The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

Edinburgh M.C.C. Hill Climb, Bavelaw Hill. April 22nd

Mr. G. Hope Wilson ~ 350 c.c. Class, Open Speed Test ~ ~ ~ **First**

A.C.U. North-Eastern Centre. Travers Trophy Trial, April 22nd

Mr. S. Bell (Beardmore) ~ ~ ~ ~ ~ **Silver Medal**

Mr. F. J. Price (Diamond) ~ ~ ~ ~ ~ **Silver Medal**

Mr. R. A. Thacker (Beardmore) ~ ~ ~ ~ ~ **Bronze Medal**

North Cheshire M.C.C. Hill Climb, Axe Edge, Buxton, April 29th

Mr. G. Oates (Edmund) ~ ~ ~ 350 c.c. Class—**First and Gold Medal**

Scottish Six-days Trial, May 1st to May 6th

Mr. H. Mortimer Batten (Beardmore) ~ ~ ~ ~ ~ **Special Gold Medal**

Mr. G. Hope Wilson (Edmund) ~ ~ ~ ~ ~ **Special Gold Medal**

Mr. H. Greaves (Beardmore) ~ ~ ~ ~ ~ **Gold Medal**

Coatbridge M.C.C. Speed Test (Flying Half-mile), May 13th

Mr. A. Douglas S. Barr [(Speed, 67.7 m.p.h.) 350 c.c. Class—**First**

500 c.c. Class—**First**

A.C.U. Northern Centre. Open Reliability Trial, May 13th

Mr. G. Hope Wilson (Edmund) ~ ~ ~ ~ ~ **Gold Medal**

Mr. S. Bell (Beardmore) ~ ~ ~ ~ ~ **Silver Medal**

South Birmingham M.C.C. Inter-Club Trial, May 13th

Mr. H. Greaves (Beardmore) ~ ~ ~ **Palmer Cup and Silver Cup**
(Best performance of the day.)

A.C.U. South-Western Centre. Open Reliability Trial, May 20th

Mr. S. Warne (Beardmore) ~ ~ ~ ~ ~ **Special Gold Medal**
(The only Gold Medal awarded in the 350 c.c. Class.)

Dublin M.C.C. Dunlop Cup Trial, May 27th

Mr. S. Smith (Beardmore) ~ ~ ~ ~ ~ **Gold Medal**

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

Sunderland M.C.C. Grimshaw Trial, May 28th

Mr. S. Bell (Beardmore)	- - - - -	Special Award
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M.C.C. London to Edinburgh Trial, June 2nd

Mr. A. S. Guthrie (Diamond)	- - - - -	Gold Medal
Mr. B. N. Taylor (H.T.)	- - - - -	Gold Medal
Mr. R. N. Thomas (H.T.)	- - - - -	Gold Medal
Mr. S. Warne (Beardmore)	- - - - -	Gold Medal

Stockton M.C.C. Centre Trial, June 11th

Mr. S. Bell (Beardmore)	- - - - -	Special Award
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A.C.U. Yorks. Centre Trial, June 17th

Mr. J. W. Moffet (Beardmore)	- - - - -	Certificate of Merit
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Glasgow Western M.C.C. 50 Miles Non-Stop Trial (Speed Judging) June 17th

Mr. G. Hope Wilson (New Gerrard)	- - - - -	Bates Trophy (Premier Award)
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Glasgow M.C.C. 12 Hours Open Reliability Trial, June 24th

Mr. G. Hope Wilson (Edmund)	- - - - -	Gold Medal
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A.C.U. Mid-Centre Trial, June 24th

Mr. H. Greaves (Beardmore)	- - - - -	Gold Medal
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M.C. and A.C. 24 Hours Trial, July 8th

Mr. H. Greaves (Beardmore)	- - - - -	Bronze Medal
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M.C.C. Brooklands Race Meeting, July 8th

Mr. A. S. Guthrie (Diamond)		
3 lap Handicap, 350 c.c. Class	- - - - -	First
Speed, 54.96 m.p.h.		

A.C.U. Midland Centre. Open One Day Trial, July 13th

Mr. H. Greaves (Beardmore)	- - - - -	Gold Medal
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The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

Ipswich M.C.C. Joint Speed Trials, July 15th

Mr. J. F. Rose (Beardmore)										
350 c.c. Class "any trim"	-	-	-	-	-	-	-	-	-	First
750 c.c. Class	-	-	-	-	-	-	-	-	-	Second
Unlimited Touring Class	-	-	-	-	-	-	-	-	-	Third

S. Birmingham M.C.C. Avon Cup Trial, July 22nd

Mr. H. Greaves (Beardmore)	-	-	-	-	-	-	-	-	-	Bronze Medal
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Scottish Speed Championships, July 29th

Mr. G. Hope Wilson (New Gerrard)										
350 c.c. Class	-	-	-	-	-	-	-	-	-	Second

B.M.C.R.C. Brooklands Races, August 12th

Mr. G. L. Werts (Curtis)										
350 c.c. Solo Handicap	-	-	-	-	-	-	-	-	-	Third

A.C.U. North Wales Centre. Open Trial, August 12th

Mr. C. M. Jones (Diamond)										
Novices' Prize	-	-	-	-	-	-	-	-	-	Silver Bowl
Best 350 c.c. Performance	-	-	-	-	-	-	-	-	-	Silver Cup
and a	-	-	-	-	-	-	-	-	-	Bronze Medal

Bournemouth and Dist. M.C.C. Half-day Trial, August 12th

Mr. W. G. Churchill (Beardmore)	-	-	-	-	-	-	-	-	-	Best Motor Cycle Performance
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A.C.U. Six Days Trial, August 21st to 26th

Mr. H. Greaves (Beardmore)	-	-	-	-	-	-	-	-	-	Silver Medal
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Scottish Western M.C. Open One Day Trial, August 26th

Mr. A. D. S. Barr (350 c.c. sidecar combination)										
Best 350 c.c. Side car Performance	-	-	-	-	-	-	-	-	-	Special Award
and a	-	-	-	-	-	-	-	-	-	Bronze Medal
Mr. G. Hope Wilson (Edmund)	-	-	-	-	-	-	-	-	-	Gold Medal

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

A.C.U. S.E. Centre. Handicap Races (Brooklands), September 2nd

Mr. G. L. Werts (Curtis)
 All Comers' Handicap - - - - - **Second**
 Mr. Werts "all but won" (*vide* "Motor Cycling," Sept. 6th, 1922).

Ipswich M.C.C. Beardmore Cup Trial, Sept. 10th

Mr. H. Green (Beardmore)
 350 c.c. Class - - - - - **First**

Surbiton M.C.C. Sopwith Cup Trial, Sept. 16th

Mr. A. S. Guthrie (Diamond) - - - - - **Silver Medal**

Scottish Two Days Open Reliability Trial, Sept. 16th and 18th

Mr. A. L. Clark (Beardmore) - - - - - **First Class Award**
 Mr. E. M. Wright (Beardmore) - - - - - **First Class Award**
 Messrs. Clark and Wright were also members of winning Manufacturer's Team.
 Mr. G. Hope Wilson (Edmund) - - - - - **First Class Award**
 Mr. J. Donaldson (Royal Scot) - - - - - **Second Class Award**

Southport M.C.C. White Cup Trial, Sept.

Mr. N. Jackman
 350 c.c. Class - - - - - **First Prize**

M.C.C. One Day Reliability Trial, Sept. 30th

Mr. A. S. Guthrie (Diamond) - - - - - **Gold Medal**

South Midland Centre A.C.U. Hill Climb, Kop Hill, Oct. 7th

Mr. G. L. Werts (Curtis)
 350 c.c. Class - - - - - **First**
 500 c.c. Class - - - - - **First**

Mr. Werts' time ($34\frac{2}{5}$ sec.) is believed to be a 350 c.c. record for Kop Hill.

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

Slough and Dist. M.C. and L.C.C. Reliability Trial, Oct. 7th

Mr. B. F. G. Fowke (Beardmore) - - - - - **Gold Medal**

Taunton and Dist. M.C. and L.C.C. Autumn Trial, Oct. 14th

Mr. W. G. Churchill (Beardmore) - - **Autumn Challenge Bowl**
and a - - - - - **First Class Certificate**

Mr. Churchill was the only competitor to climb Stout Hill, Bagborough,
previously said to be "unclimbable."

Berkhampstead and Dist. M.C.C. Hill Climb, Oct. 29th

Mr. G. L. Werts (Curtis)
350 c.c. Class - - - - - **First and Silver Cup**
Unlimited Class - - - - - **Second and Gold Medal**

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

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Unlimited Class - - - - - **Second and Gold Medal**

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

your claims. Entering the bike in a reliability trial on Sunday last, I finished up three minutes early at tea time after getting lost, &c.

"I think your engine one of the finest I have ever ridden and I have been across practically every known make. The flexibility, acceleration and power of the engine are somewhat marvellous and uncanny."

R. A. C.

17th July, 1922.

"The Curtis finished seventh in the 100 miles (Brooklands) out of fifty-four entries, averaging, I believe, about 56 or 57 m.p.h. There were no stops and laps were run off without the slightest dropping off of speed; as a matter of fact the machine seems just as fast for thirty laps as one."

S. W.

1st August, 1922.

"The engine runs splendidly and I have never ridden any single so sweet, powerful, and flexible."

T. A. M., Lt.-Col.

2nd August, 1922.

"The smooth running of the engine is delightful and has been remarked upon by everyone who has seen it on the road. I . . . congratulate you upon the splendid design of the engine and the excellent workmanship put into the manufacture."

T. C. B.

4th September, 1922.

"The flexibility of the engine makes traffic-dodging a pleasure and hills of no account."

H. C. J.

5th September, 1922.

"The power is marvellous—it is very nearly equal to a big four. . . . I shall be a long time before going back to the poppet valve engine, this is kept in tune so easily."

B. B.

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

3rd October, 1922.

"One can appreciate to the full the beautiful operation of the sleeve valve engine and this in its way is nothing short of ideal. The silent working, freedom from vibration, flexibility and wonderful acceleration of the Barr & Stroud makes a new phase in motor cycling which, without exaggeration, can be said to be comparable with the difference between driving in a motor car and a Rolls-Royce!"

A. F. B.

5th October, 1922.

"I can assure you I shall want a lot of re-converting back to poppet valve engines. I'd sooner have a 350 sleeve than any 1000 poppet engine."

N. J.

8th October, 1922.

"Altogether I have covered very close on 4000 miles during the six months and throughout the whole of the time the engine has proved the very essence of reliability."

"The engine is particularly happy at a speed between 25 and 30 m.p.h. This is not the result of observations on a single run, but has been my experience throughout since the "running in" period. At this speed (with a $5\frac{3}{4}$ -1 top gear) it just hums along without the slightest vibration and appears to be absolutely tireless too. It is sheer joy to drive under such conditions."

"These delights at speed are only equalled by the wonderful slow running; so smooth and so regular, not the slightest sign of snatch or jerkiness, and no fuss or din: just a chuff-chuff and a gliding sensation that certainly needs experiencing to be believed—and all this with precisely the same carburettor setting as that used for faster work. It is really ideal for town and traffic work."

"The power of the machine is certainly amazing for its capacity. It simply revels in hills, chugging its way up anything like a tough customer in the most persistent manner...."

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

"And so after six months all round running, I find myself more enthusiastic than ever over my choice, and I am certain that so long as I am a soloist, I am a Barr & Stroud-ist too."

J. W.

3rd November, 1922.

"I am sure you will be interested to know how the Beardmore-Barr and Stroud has been running since I took delivery from you early in March. It has now been on the road 8½ months, and during that time I have travelled just over 14,000 miles, visiting practically every town south of Sheffield. Not once during my travels have I suffered a breakdown of any kind whatsoever, and the machine is running now as well as when I took delivery; in fact, I think she is running better.

"I have repeatedly tested the petrol and oil consumption and, taking an average for both, the former works out at 130 miles per gall., and the latter just over 2,800 miles per gall. On long journeys I have repeatedly found that the petrol consumption works out at between 170 and 180 miles per gall. This may sound far-fetched, but nevertheless it is absolutely correct; it took several long runs to convince me.

"So far as the Barr & Stroud engine is concerned, it has stood up to the mileage without any sign of wear and runs with that beautiful smoothness and power that one associates with only high class and powerful engines. Both internally and externally it is as new, and it is remarkable how cool it keeps, even on most gruelling journeys. Decarbonising is a very simple matter, taking only 20 minutes or half an hour at the most.

"I would also mention that I have rarely had to come down on second gear on any of the main road hills I have ever been up, both in England and in Wales, and I have never known the engine to 'pink' or knock; this appears to be an impossibility. Also for acceleration and flexibility, one cannot wish for better.

"Allow me to thank you for persuading me to buy this make of bike. I have never regretted it and consider it is the ideal mount for my business as a Commercial Traveller."

L. D. R.

The Originals of these Letters can be seen by arrangement.

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

PRESS OPINIONS

EXTRACTS from Press Comments on the Barr and Stroud
350 c.c. Single Sleeve Valve Engine.

8th December, 1921.

"The operation of the single sleeve is the last word in simplicity ; the engine is beautifully finished and is wonderfully silent and flexible in action ; added to this, it is a highly efficient job, capable of high speed and low fuel and oil consumption."

THE MOTOR CYCLE.

4th January, 1922.

"It is certainly extremely efficient for its size, and, as a touring machine, it is as charming to drive as anything that we have tried. Its large external flywheel permits smooth, slow running and splendid acceleration. Up to a speed of 35 to 40 miles an hour the engine, on a 5½ to 1 gear, runs as smoothly as a top. . . . Equally charming is the manner in which every fraction of the throttle opening takes effect."

MOTOR CYCLING.

13th January, 1922.

"It is hardly necessary to say that the engine is beautifully made."

ENGINEERING.

29th March, 1922.

"The engine is . . . remarkably silent . . . possesses as much power as the fluffy type of 4 H.P. single, and evinces no tendency to overheat."

"Carbon" in MOTOR CYCLING.

30th March, 1922.

"J. Donaldson's stock 2¾ Royal Scot evoked very favourable comment, especially on the score of silence, the Barr & Stroud sleeve valve engine being almost inaudible."

THE MOTOR CYCLE.

(Describing the climb of Kop Hill in the A.C.U. Stock Trial.)

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

18th May, 1922.

"The new sleeve valve engine certainly fulfils expectations. Its wonderfully silent tick-over was widely commented upon, and at the checks, where other riders were waiting, I could not tell whether or not the engine was going except by looking down at the flywheel. It is a very sturdy puller. On the third day I broke my magneto Bowden, but did not trouble about repairing it, as the engine cannot be made to pink, and pulls to its last gasp whether at full advance or full retard. Unquestionably, a great future for this engine. It cannot be made to over-heat, and, so far as I can judge, it is as good as the poppet valve in every respect, and a great deal better in many ways. Both Greaves and myself did 70 miles to the half gallon over one of the most difficult sections of the route, and oil consumption was negligible."

H. MORTIMER BATTEN, in THE MOTOR CYCLE.

7th June, 1922.

"The engine is exceptionally sweet-running and very quiet."

MOTOR CYCLING.

8th June, 1922.

"Whenever I hear B. & S. mentioned now I get prepared to listen to a eulogy of the wonderful little engine."

"I doubt if any other motor cycle power unit has had such instant and unqualified success. It excels not only in speed, which is usually attended by undesirable features such as lack of flexibility, but in every branch of the sport."

GREENOCK TELEGRAPH.

20th July, 1922.

"Take the best single cylinder poppet valve machine there is—letting 'best' in this instance signify such qualities as flexibility, silence of operation, and freedom from vibration. . . . Mount a machine powered with the B. & S. engine . . . and an indescribable difference will be sensed."

"The engine is capable of a thoroughly satisfactory touring performance on the open road. In hill climbing, too, there is ample power for the ascent of

The BARR & STROUD SINGLE SLEEVE VALVE ENGINE

the brand-new sleeve each morning and, when once warmed up, the engine is extraordinarily free. . . . While the engine is running itself in, its chief peculiarity, by comparison with more familiar types, is the phenomenally dogged way in which it slogs uphill at a countable rate of popping. Not for many, many years have I sat over an engine which went on pulling quite smoothly down to such incredibly low r.p.m."

"IXION" in THE MOTOR CYCLE.

13th October, 1922.

"The power is really amazing and the top gear performance of our sidecar outfit would have put to shame more than one modern $4\frac{1}{4}$ H.P. combination that we know of. . . .

"The Barr & Stroud engine is very economical. On solo machines we have found it possible to get between 120 and 140 miles per gallon, while oil consumption is easiest described as negligible."

THE MOTOR WORLD.

25th October, 1922.

"There can be no doubt whatever that the air-cooled sleeve-valve engine has come to stay. For silence and sweet running the new (350 c.c.) Barr and Stroud closely rivals the best horizontal twin, and indeed it is impossible to tell from the manners of the engine, except at very low speeds, whether one is astride a twin or a single. Previously I have always held that there is no disguising the single, much as one may appreciate its merits, but the sleeve-valve comes peculiarly near to it.

"What surprises me most about this unit is, however, its remarkably cool running. Normally it does not heat up sufficiently to evaporate the dew-drops which collect on its fins during an early morning ride, and one can keep one's palm on the fins without discomfort. The result is that it will pull an abnormally high gear, a condition which is further rendered possible by the fact that the unit is an anti-pinker. One can deliberately 'konk it out' with everything wide open, but without a single pink of protest.

"Considering these essential features there is doubtless a great future for this engine in the larger sizes for sidecar and cyclecar propulsion, and it goes without saying that it scores chiefly by its evenly distributed heat distortion."

"CARBON" in MOTOR CYCLING.

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"CARBON" in MOTOR CYCLING.

LIST OF FIRMS

who supply Motor Cycles fitted with the Barr and Stroud $2\frac{3}{4}$ H.P.,
4-Stroke Single Sleeve Valve Engine:

“**Banshee**”—Messrs. THE BANSHEE MANUFACTURING CO., Ltd., Broms-
grove, nr. Birmingham.

“**Beardmore-Precision**”—Messrs. F. E. BAKER, Ltd., Precision Works,
King's Norton, nr. Birmingham.

“**Coventry B. & S.**”—Messrs. COVENTRY BICYCLES, Ltd., Gosford Street,
Coventry.

“**Coventry-Mascot**”—Messrs. THE MASCOT CYCLE CO., 49 Gresham Street,
Stoke, Coventry.

“**Crest**”—Messrs. THE CREST MOTOR CO., Blackdown Mill, Leamington
Spa.

“**De Luxe**”—Messrs. DE LUXE MOTORS, 174 Corporation Street, Birming-
ham.

“**Diamond**”—Messrs. THE D. F. & M. ENGINEERING CO., Ltd., Vane
Street, Wolverhampton.

“**Edmund**”—Messrs. C. EDMUND & CO. (1920), Ltd., Milton Works, Milton
Street, Chester.

“**H. T.**”—Messrs. H. T. MOTOR CYCLE CO., Park Street, nr. St. Albans,
Herts.

