

The "MODEL H" that wasn't

Oracle looks at a Matchless design that, somehow, didn't reach the public

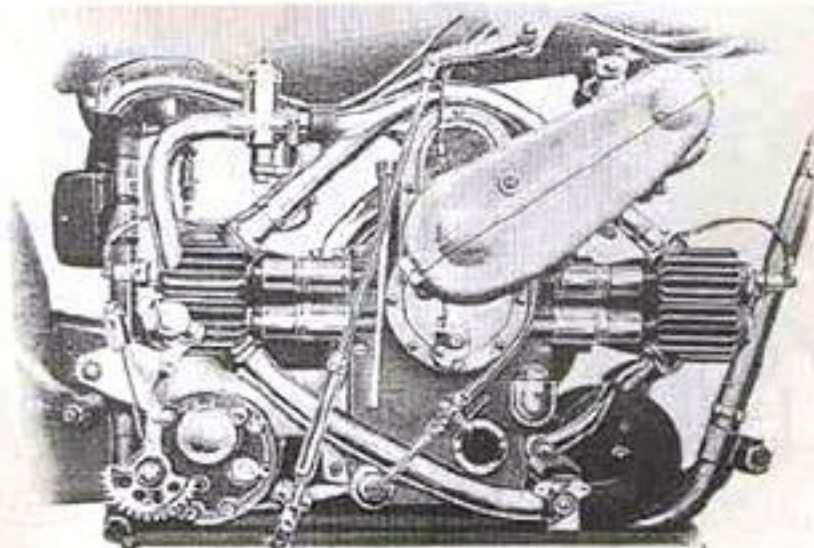
provided by Gordon was dated December 13th 1916, a date slap in the midst of the most terrible war the world had ever known, yet spirits must have been high for better days to come and nowhere more so than in the busy factory at

Plumstead, Woolwich, London, where Messrs H.A. Collier & Sons Ltd were engaged on work of national importance. Their busy minds and hands may have been fully occupied in producing munitions, but they could still find precious moments to translate forward thinking motorcycling ideas into metal it seems, for here was a complete passenger motorcycle combination already under test by the press and evidently ready for production

the moment peace returned. What's more, this project was new from stem to stern.

The machine was propelled by a side valve flat-twin engine - a complete break with tradition for Colliers - displacing some 732cc from its two 70mm x 95mm cylinders. Cylinder barrels were heavily finned to eliminate over heating and abnormal expansion or contraction, whilst a single gear driven cam pushed the tappets to open massive 1 1/2" valves whose stems and springs were thoughtfully protected from dirt and grit by telescopic covers. A one-piece nickel steel crankshaft provided rigidity and alignment at the bottom end, plain bearings being adopted for the mains and the two connecting rods, which were "H" section steel stampings.

A huge 12 1/4" diameter flywheel was mounted externally on the driveside mainshaft. Typical of the advanced thinking throughout the design, Colliers must have been amongst the first to fit aluminium alloy pistons in this engine, the principal having only found recent practical favour through rapid wartime development within the aero engine industry. A C.A.V. magneto on top of



The nice thing about this pastime is that something new is always turning up, perhaps a strange thing to say when everything we deal with is decades old in the first place; but what I mean to imply is that there's always something new to learn.

T'was reader Gordon Jeal from Coventry who caused this latest rambling, when he sent in a few pages from a publication titled the *Irish Cyclist & Motor Cyclist* (estab'd May 1885, no less) wherein appeared details of a flat-twin Matchless. "Never knew that Matchless built a flat-twin" added Gordon, did you? Well, no, can't say that we did, so we looked into it a little more thoroughly and after a fortuitous call to a friend who specialises in the marque we found ourselves in possession of what must be a very rare catalogue indeed.

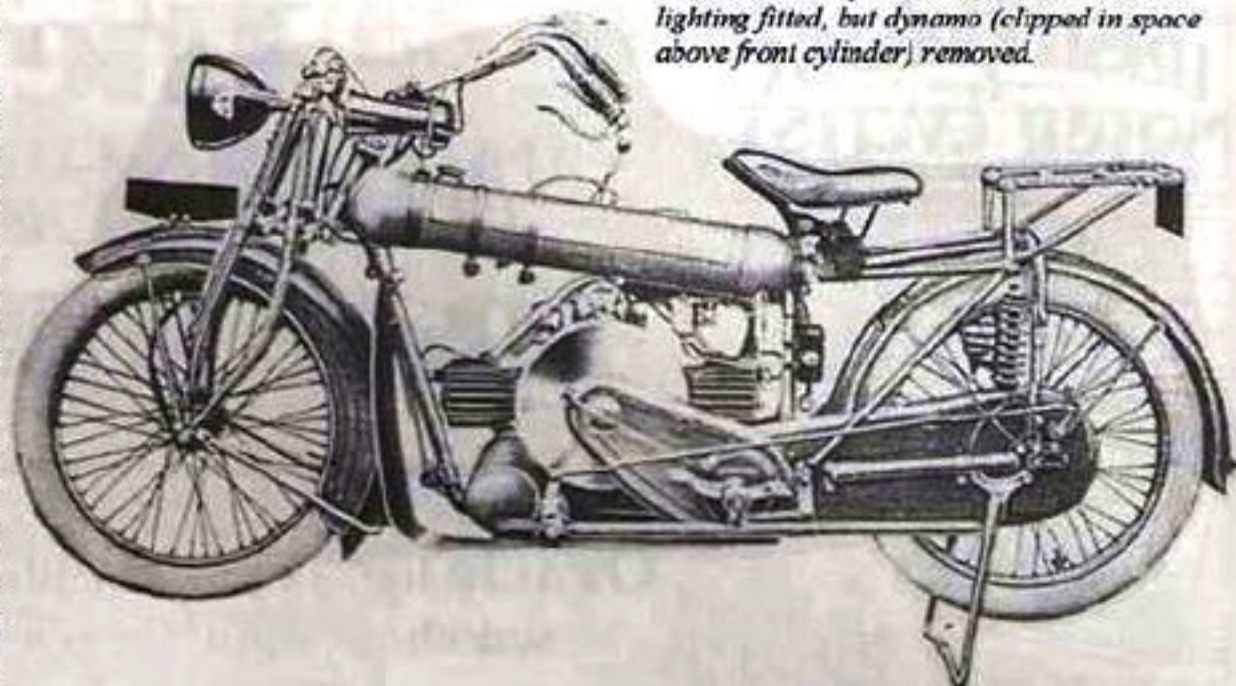
The part magazine

the crankcase provided the ignition source, with breathing through a single lever A.M.A.C. carburettor on the end of a somewhat lengthy inlet tract. To our mind, this whole engine layout might well have been influenced by the well known Williamson machine; but then, it is only our opinion.

Lubrication was handled by a mechanical plunger pump, driven from the engine camshaft and mounted externally by the timing chest. This pump drew oil from a half gallon capacity container within the crankcase casting and distributed it through drillways in the crankshaft to the mains and big ends, with separate piped feeds going to the clutch housing and the primary drive chain. It was all automatic, took away the primitive hand pumping arrangements normal on British machines of the time and ensured a steady supply of clean oil to the vital working surfaces of the engine; a sight glass built into the oil chamber wall allowed an eye to be kept on lubricant levels.

Drive to the three-speed gear was via a silent chain, the inverted tooth type, it being enclosed in a case. The gearbox itself was mounted together with the engine thus forming a unit and as its shell was of circular outline, it could be rotated within its mountings to keep the primary chain correctly tensioned. All neat and innovational. A further conventional roller chain took the drive to the rear wheel, again fully enclosed and arranged so that it need never be disturbed when wheel changing was necessary. The Matchless patent system of q.d. wheels being adopted on all three wheels by means of a simple knock-out spindle secured by a single nut.

The frame was



Nearside view of the machine, with electric lighting fitted, but dynamo (clipped in space above front cylinder) removed.

something entirely new, although it incorporated some details from pre-war Matchless efforts in all major respects it was radical to say the least. For a start, the top tube had been so increased in diameter that it could double as an integral fuel tank, thus dispensing with the usual soldered tinplate tank, all its necessary clips and its weaknesses. Behind the saddle tube, a structure of tubes held the rear wheel in correct

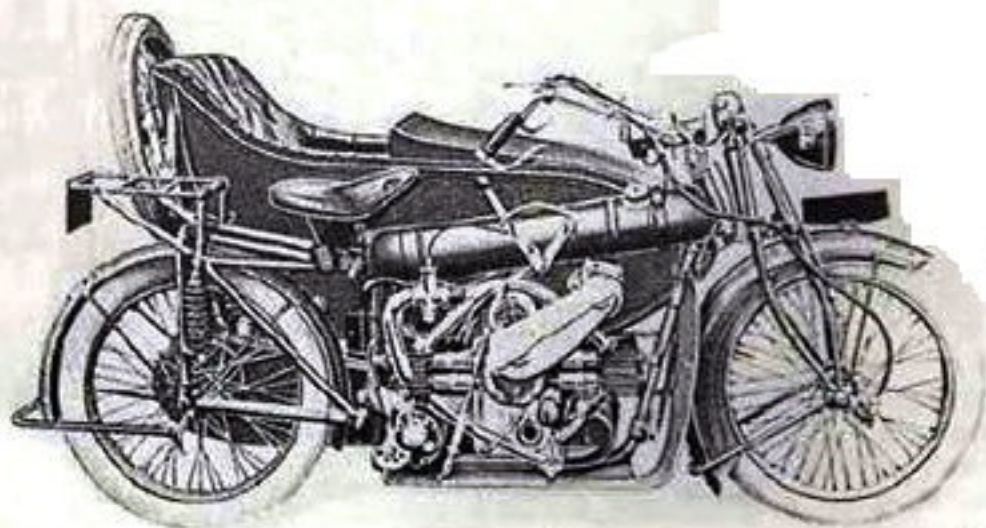
A swinging arm frame... as it would be known to a generation 40 years later...

alignment while allowing it to move through a useful arc under the control of coil springs mounted either side. The pivot for this springing feature was at the base of the saddle tube and

immediately behind the final drive sprocket of the gearbox. It thus kept the final chain in almost constant tension throughout the range of suspension movement.

A swinging arm frame, as it would be known to and understood by a new generation of motorcyclists nearly 40 years later. The front forks were traditionally Matchless, effective if unwieldy to the eye. Front wheel braking was still by stirrup, a poor old do in relation to the remainder of the machine, the rear wheel being retarded by means of an internal expanding ring.

Also traditional was the paintwork, finished in a khaki shade of enamel, enhanced by gold and green lining, the usual bright parts being plated in nickel and with an optional electric lighting system and electric horn being available courtesy of a Lucas dynamo mounted



beneath the frame top tube/fuel tank. Tyres were 650 x 65 beaded edge, with a spare wheel fixed to the carrier on the rear of the coachbuilt sidecar body. Intended from the outset as a complete outfit, the sidecar was connected to the motorcycle frame by no fewer than six attachment points, the sidecar wheel and the rear

wheel of the machine being so designed that they moved in unison. Long swept back touring handlebars caused an upright but comfortable riding position and an engine undershield which turned upwards at the front gave weather protection to the riders legs.

All most admirable and the *Irish Cyclist & Motor Cyclist* concluded its favourable review with the words "...coming as it does from a house of such good repute it will find many purchasers when it is placed on the market." What they didn't give, was the model name/number of this exciting newcomer, the Matchless catalogue however, dated 1917 calls it the "Model H".

But that's not a Model H we hear you saying, we know that bike, it had a thumping great J.A.P. and later M.A.G. i.o.e v-twin, engine and a conventional fuel tank and it came out just after World War I. True, on all counts. The H models we see around in vintage events today also have a similar rear springing system and interchangeable wheels and

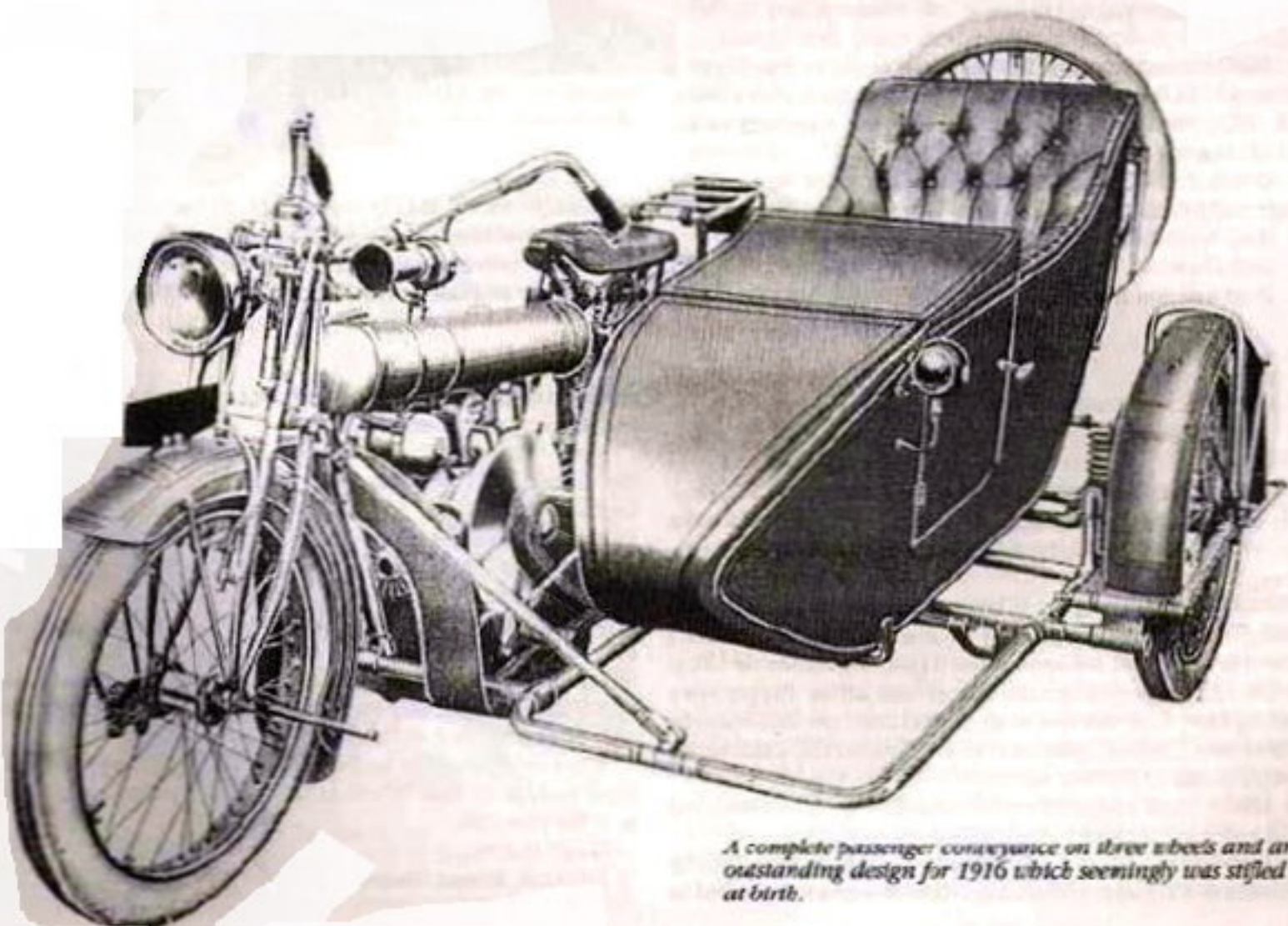
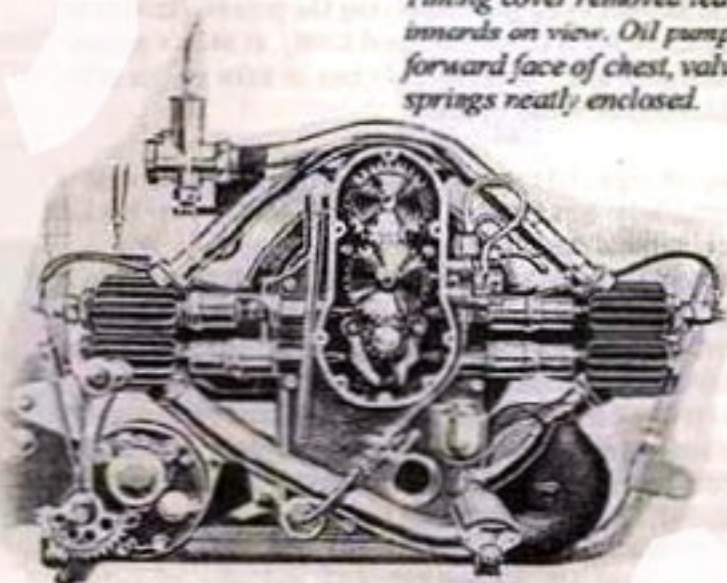
were sold as complete outfits, but they aren't like this particular Model H. Why?

We can't tell you that, nor how many of the flat-twin design were actually made. It could be that there was only the prototype, registered as LK 3496; which, if the case, would certainly have been subjected to the extensive testing claimed by the maker's in their catalogue. This catalogue is so impressive and well prepared that it must have been the intention to make and sell the flat-twin in huge quantities. If, as we are led to believe, it worked well, why wasn't it

proceeded with? Remember, Colliers were not in the habit of making their own power units at the time, it was some years more before they built everything in-house; perhaps they hit a production snag, a problem in getting hold of the machinery on which to build the engines?

Whatever the answers, Colliers never again used a flat-twin engine in any of their motorcycles.

Timing cover removed leaves the innards on view. Oil pump is on forward face of chest, valves and springs neatly enclosed.

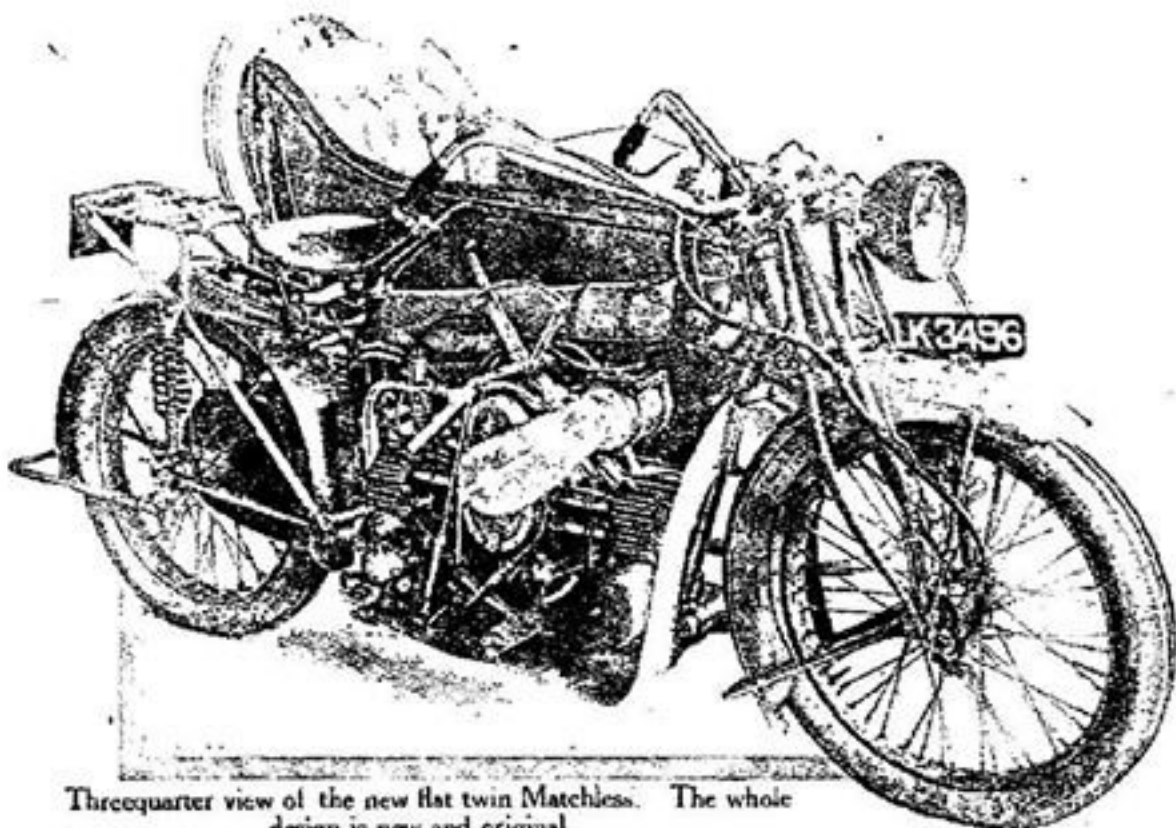


A complete passenger conveyance on three wheels and an outstanding design for 1916 which seemingly was stifled at birth.

THE 5-6 h.p. FLAT TWIN MATCHLESS.

70 mm. x 95 mm., 732 c.c., Three Speeds, all wheels sprung.

FEW members of the motor cycle business deserve greater success than H. Collier and Sons, Ltd. Since 1903 the two sons have devoted their lives to the movement, and, by engaging in many competitions and races, have sought to evolve the perfect motor cycle. Having known both Charlie and Harry Collier for the past thirteen years, we have watched the progress they have made in the design of their machine, and have always admired their devotion to their business, which was also their pleasure. In the early days they engaged almost entirely in speed work on the track, and it was while occupied in this that they obtained their wonderful practical knowledge of the motor cycle engine. This knowledge has stood them in good stead, and has been of undoubted value to them in designing their own engine. Although for many years they assembled their machines and bought their engines from outside firms, they were by no means ignorant of engine design, and considerably altered for the better many of the engines built up into their machines. Now, for the first time, they have designed their own motor, and a very successful production it is. Being absolutely up-to-date in their ideas, they have evolved a 5-6 h.p. flat twin embodying the very latest practice in motor cycle engine design. Furthermore, being cognisant of the magnificent future for British motor cycles in the Overseas Dominions, they have placed upon the market a well-tryed and thoroughly efficient spring frame, while not only has the absence of vibration of the flat twin led them to adopt this form of engine, but also the fact that



Three-quarter view of the new flat twin Matchless. The whole design is new and original.

the ground clearance is much greater than is possible in the case of the V type engine, the actual clearance being 5 1/2 in. This is a point which will be much appreciated by Overseas customers.

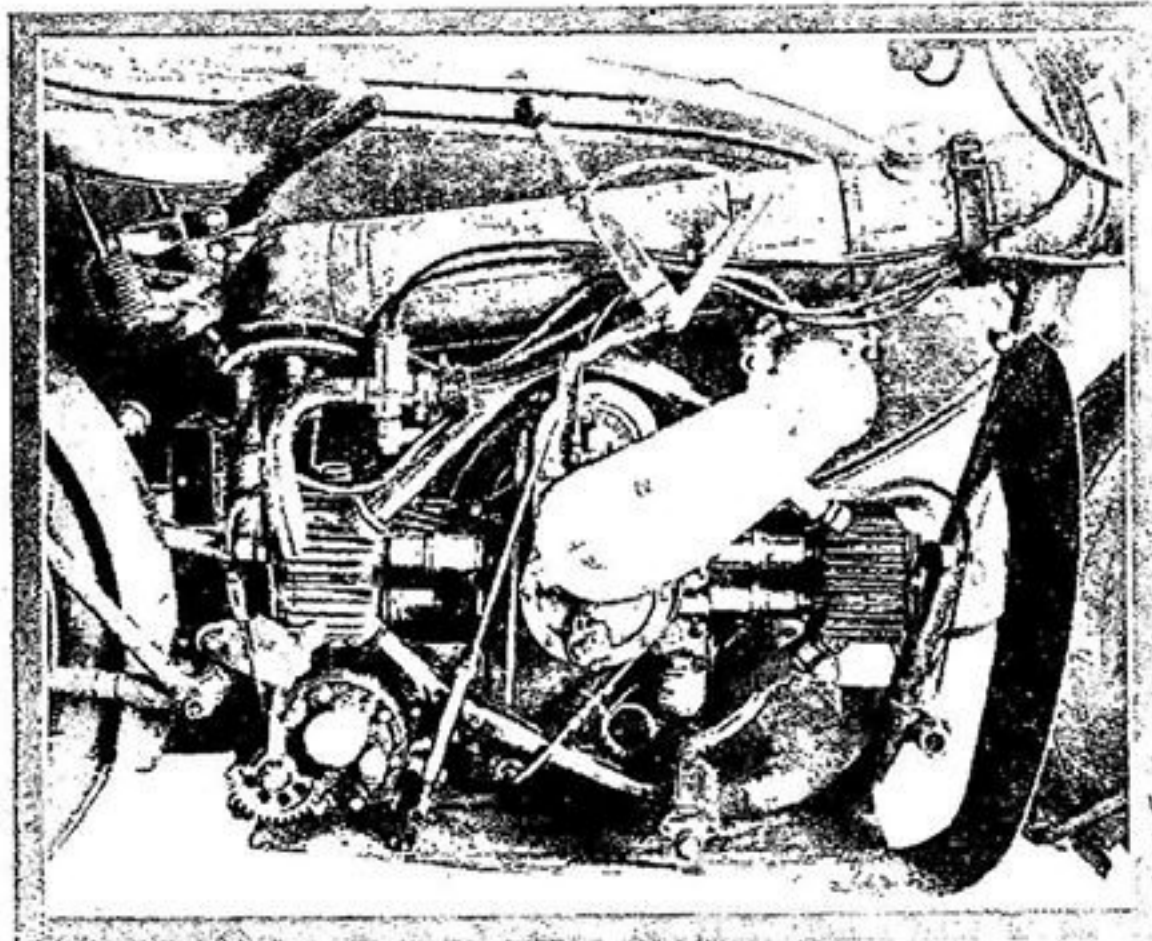
The frame is a total departure from the firm's standard practice. In the first place, the tubular tank of steel, containing two gallons of petrol, forms the top member of the frame, and has a slight

upward slope towards the head. The down tube forms a sort of loop, and acts as a support for the engine. The spring forks have been somewhat improved in design, the lower pair of links being now inside the main members of the forks, which are wide enough to allow the mud-guard to form a perfect sweep from the front of the extension right down to the back.

The system employed in the springing of the rear portion of the frame was clearly indicated in the issue of October 21st, 1915, page 401, and this has only undergone slight improvements in detail. The method adopted is to interpose coil springs between the movable rear forks and the rigid portion supporting the rear carrier. All moving parts, both on the front forks and the rear springing system, are provided with grease cups. These, however, will not be retained. Instead, a grease gun will be supplied, having a screw-on end, and on the dust caps taking the place of the grease cups, being removed, the nozzle of the grease gun may be screwed on to the hollow spindle, and the grease injected. This is much less trouble than the filling of numerous grease cups, one grease gun full being probably sufficient for all the points requiring attention.

The Power Unit.

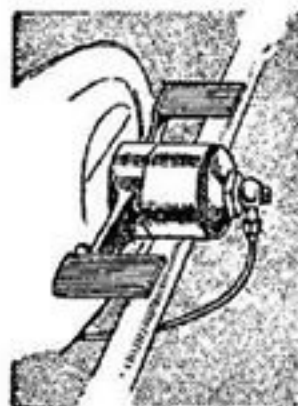
The question of accessibility has been carefully studied in the design of the new Matchless engine arrangement, which is so carried out that the cylinders may be removed without taking the engine out of the frame. The radiating fins run longitudinally down the cylinders and taper towards their base. The cylinders are off-set to the amount of one inch. Both valves are horizontal and are arranged at the side in an accessible position, telescopic valve



Details of the power unit of the 5-6 h.p. flat twin Matchless.

The 5-6 h.p. Flat Twin Matchless.—

spring cams being employed which exclude all grit from the interior working parts of the valve system. Of the two portions of the valve spring cover the larger screws on to a ring surrounding the base of the tappet guide, and when it is found necessary to replace a valve it is unscrewed and slipped back, thus exposing the end of the valve stem and cotter. The valve gear is exceedingly simple and interesting, only three pinions being employed, while one set of cams actuates both inlet and exhaust valves.



The rocking form of clutch pedal is retained. Note the oil lead for lubricating the clutch.

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The Lubrication System.

A plunger pump actuated by one of the valve cams delivers the oil to two passages cast in the crank case, which lead direct to the main bearings; that is to say, the oil enters the bearings at both sides, the crankshaft is hollow and the lubricant is driven under pressure through it and exudes at the big end bearings, all excess returning to the sump. At the base of the sump whence the oil is delivered there is a large gauze which adequately filters it from all impurities. The system has been found to be most successful, and since the oil is delivered under pressure it is bound to reach those parts which need copious lubrication. A window has been let into the crank case just below the filling orifice which indicates the level of the oil in the sump.

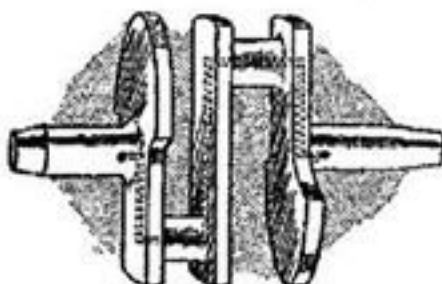
Induction and Exhaust.

The arrangement of the carburetter is somewhat unconventional, the inlet pipe forming a complete bow, passing from one cylinder over the top of the timing gear case to the other, but near the top

of the arc of the bow there is a branch pipe to which the Amac carburetter is attached. Long experience with motor cycle engines has made the brothers Collier realise the fact that it is always beneficial to take the air in warm if possible, no matter whether pure petrol or a petrol substitute be used; consequently a warm air pipe is fitted to the main air intake.

The design of the exhaust pipes is also worthy of note, the pipe from the rear cylinder entering the bottom of the expansion chamber, while the exhaust gases from the front cylinder issue through a short pipe into the top of the expansion chamber, the final exit being through a long pipe on the rear side of the machine.

At first the designers were troubled with a fault which is common to flat twins, namely, a "ring" in the flywheel, and this they have corrected in quite an ingenious manner by interposing between



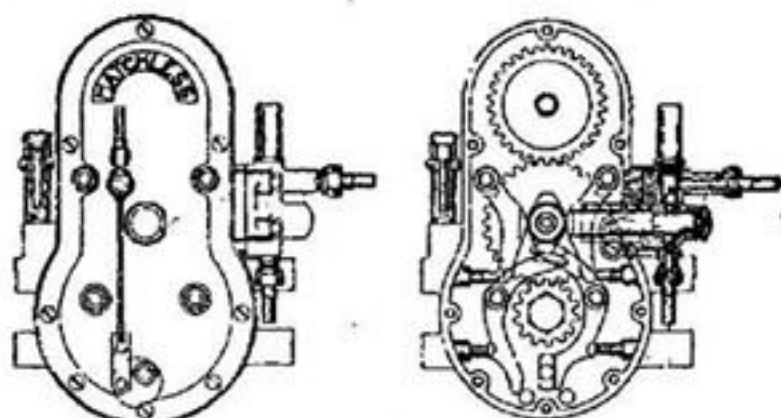
The crankshaft, showing the manner in which the oil ways are drilled.

the periphery and the flywheel boss a disc of three-ply wood securely bolted up to the face of the flywheel, and this effectually deadens the noise.

Ignition.

The magneto fitted is the C.A.V., the advance spark lever being actually on the contact breaker and within easy reach of the driver. In actual practice it is found that the position of the spark lever requires practically no alteration. At the bottom of the timing case will be noticed the exhaust valve lifter, the crank for which consists of a small pin eccentrically mounted on a disc, which has a piece cut out of the lower portion, so that on the valve being dropped the indentation rests against one of the studs holding on the timing case cover. The exhaust lifter is of the double cam variety, the two cams actuating the exhaust rockers.

An interesting experiment is the



General arrangement of valve gear and lubricating pump.

fitting of aluminium alloy pistons, which so far have given every satisfaction.

Transmission.

In the new Matchless the circular type of gear box is retained, but owing to a slight modification of the design of the teeth, which enables the gear wheels to be made lighter, the new gear box is of rather smaller dimensions than previously. It is carried in two plates, extending from the crank case to the bottom bracket lug, and is held in position by two steel straps. To adjust the front chain the two nuts at the ends of these straps are loosened, and by applying a special spanner to two of the lower nuts in the gear box the whole may be rotated, thus enabling any slack to be taken up.

It will be noticed that the Lucas dynamo is driven by a chain off the camshaft, and is carried in a bracket suspended from the tank, the chain being neatly enclosed in an aluminium case.

The clutch consists of two steel plates, hardened and ground, engaging with a central plate of cast iron forming part of the sprocket. An arrangement has been made so that, in the event of the machine being used as a solo mount, the clutch may be controlled by means of a Bowden wire from the handle-bar. The lubrication of the clutch is provided for by a branch pipe from the oiling system.

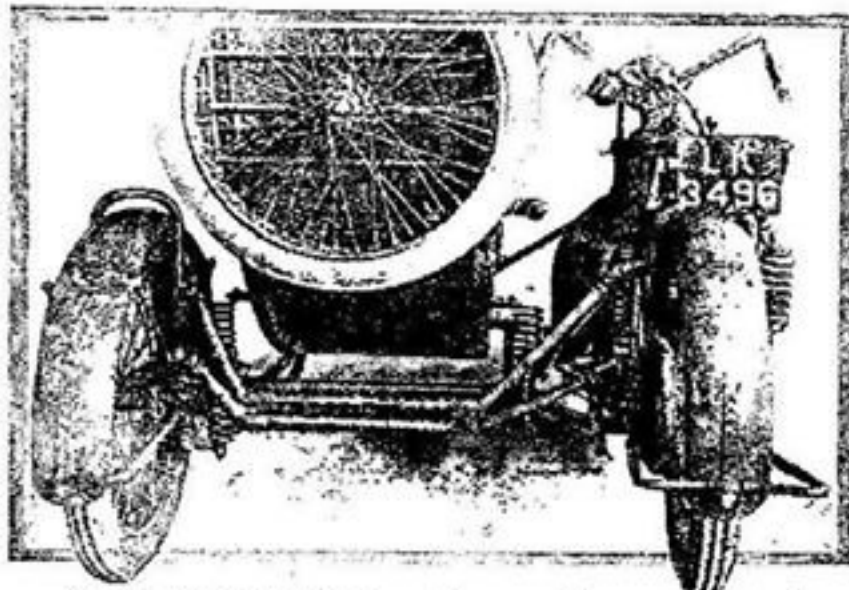
From engine to gear box the transmission is by silent chain, which is, of course, enclosed.

Considerable ingenuity has been displayed in arranging so that the rear chain cover is free to move with the lower and movable portion of the spring frame.

The mudguarding has been particularly well carried out, the guards being 5 1/2 in. in diameter, while an additional mudshield is fitted to the down tube, and is arranged so as not to impede the cooling. This is continued below the power unit, and acts as an efficient undershield.

The Sidecar.

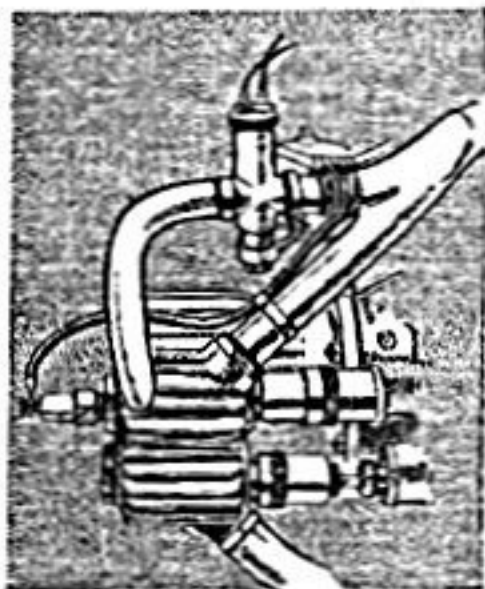
The same system of springing as is employed in the rear of the machine has been adapted to the sidecar, inasmuch as both the wheel and also the sidecar body are sprung on coil springs. The form of staying at the rear of the sidecar frame is interesting. This consists of double tubes attached to the uprights forming a portion of the motor bicycle frame. This arrangement enables both the sidecar wheel and the rear wheel of the motor bicycle to move more or less in unison, therefore the fault present in many combinations in which the sidecar wheel is sprung, namely, that of instability and



Rear view of new Matchless sidecar combination, showing the duplex tube joining the sidecar and motor cycle, and causing the two sprung wheels to work in harmony.

The 5-6 h.p. Flat Twin Matchless.—

a tendency to lean when turning corners to the left, is entirely absent. The sidecar wheel is also provided with a stand, similar in design to that employed in the front wheel. The sidecar is well sprung and luxuriously upholstered, while at the



Method of fixing the carburetor and the valve spring cover.

back thereof is carried the spare wheel and also an efficient luggage carrier. It will be noticed that both the luggage platforms on the new Matchless are on sprung portions of the machine, which is distinctly an advantage.

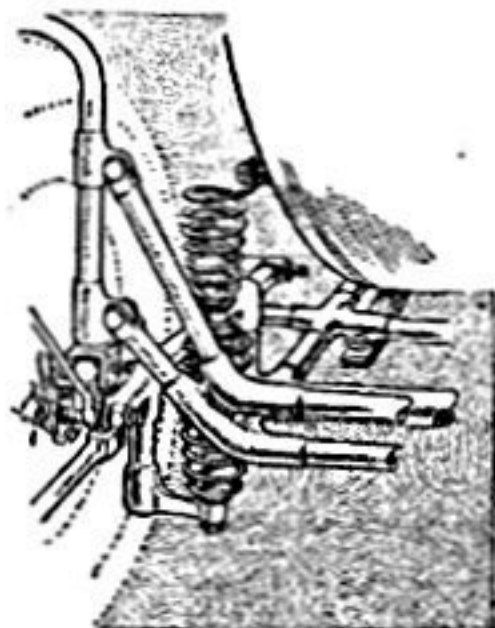
The Machine on the Road.

We were next taken for a short run in the district round Woolwich, which is decidedly hilly. The first turning to the right past the works brought us on to quite an appreciable gradient, which the engine took comfortably on top speed, mounting up gradually until we reached Woolwich Common. We noticed that the sidecar was exceedingly well sprung,

though Mr. Harry Collier assured us that he was not satisfied as to this point, affirming that the rider was more comfortable on the machine than in the sidecar. The roads were certainly rough in this locality, and personally we could find no fault whatsoever. The engine developed plenty of power, but seemed a trifle noisy—a fault which Mr. Collier readily acknowledged. Hitherto his efforts had been to obtain the maximum power for the engine, and he admitted that it required still further taming down both as regards the noise of the engine and of the exhaust, though with the latter little fault could be found.

On Woolwich Common we took control of the machine and drove for some considerable distance. Having driven a 1916 Matchless not long previously we soon became accustomed to the driving of the new mount. The engine possessed an ample degree of acceleration and was quite free from vibration, the clutch took up the load sweetly, and the gears went into engagement without a sound. The comfort of the spring frame was most noticeable on the rough road across the Common, which eventually brought us into Shooters Hill. A considerable amount of traffic was met, but the engine proved itself flexible, and we felt quite at home in negotiating it. On reaching Shooters Hill Road we found the surface distinctly good, though a little wavy in places, but the machine rode over the waves with an exhilarating and swinging motion which was delightfully comfortable. Having slowed up for the cross-roads at the foot of the hill we were practically brought to a complete standstill through a boy who saw fit to dismount from his bicycle and hold a conversation with a carter in the middle of the road. This necessitated a change down to second and reduced the speed of the machine to about four miles an hour. On opening the throttle it immediately picked up and the top was engaged, but not before we were well

on to the gradient. However, the engine rapidly accelerated on top until just near the crest of the hill, passing over the summit still in top speed and with



Details of the sidecar suspension, the sidecar wheel springing, and the duplex tubes forming the rear member of the frame.

the engine not labouring in the slightest degree. We noticed that considerable improvement has been made in the design of the handle-bars, these being much wider than on the previous model. Altogether, the run on the new Matchless was a delightful experience, and we greatly look forward to a closer acquaintance with this machine on the road at no very distant date.

It must be distinctly understood that Messrs. Collier and Sons are not in a position to deliver any machines. This is merely the prototype of their post-war model, which they hope to deliver to the public very shortly after the cessation of hostilities.

