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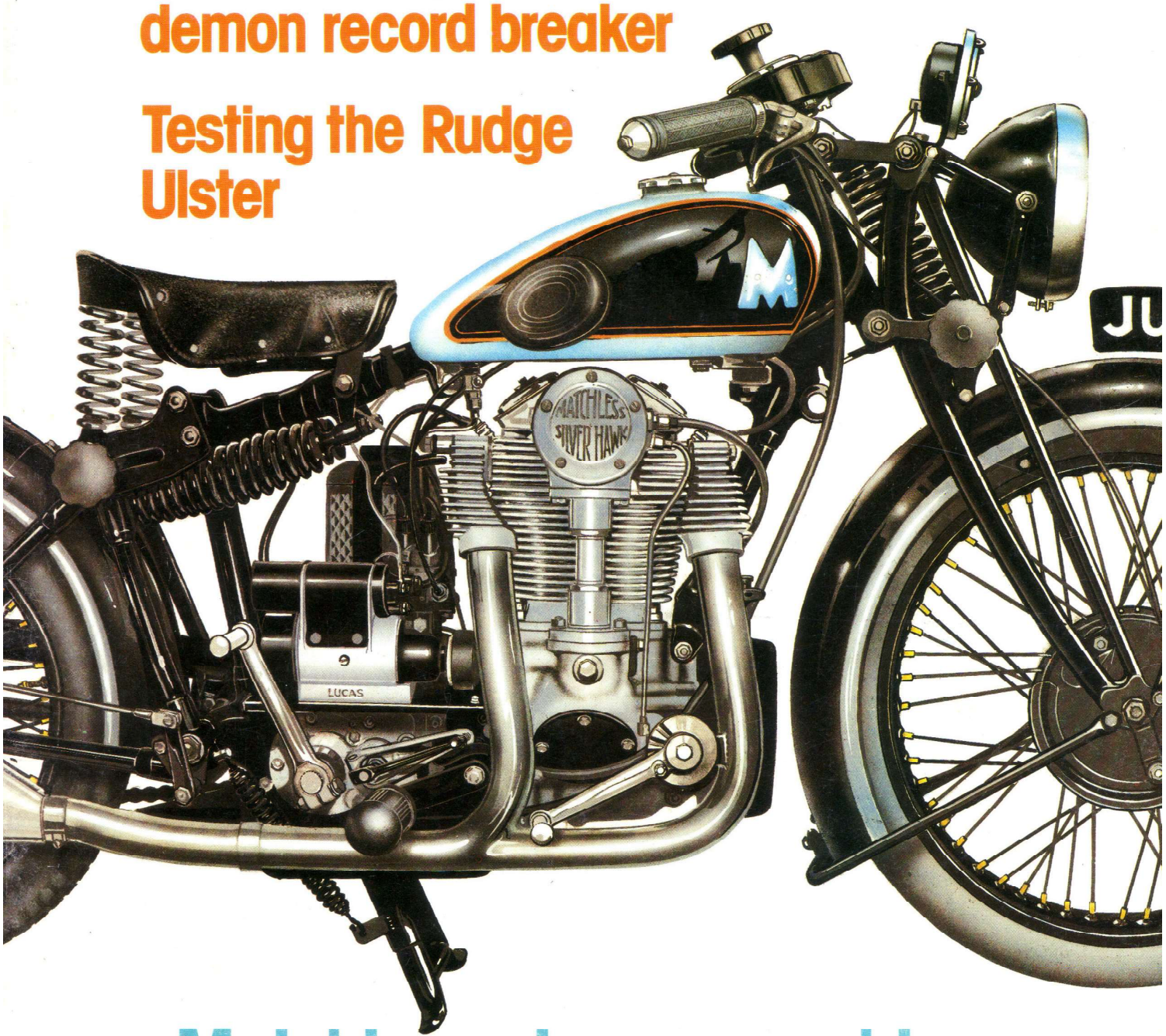
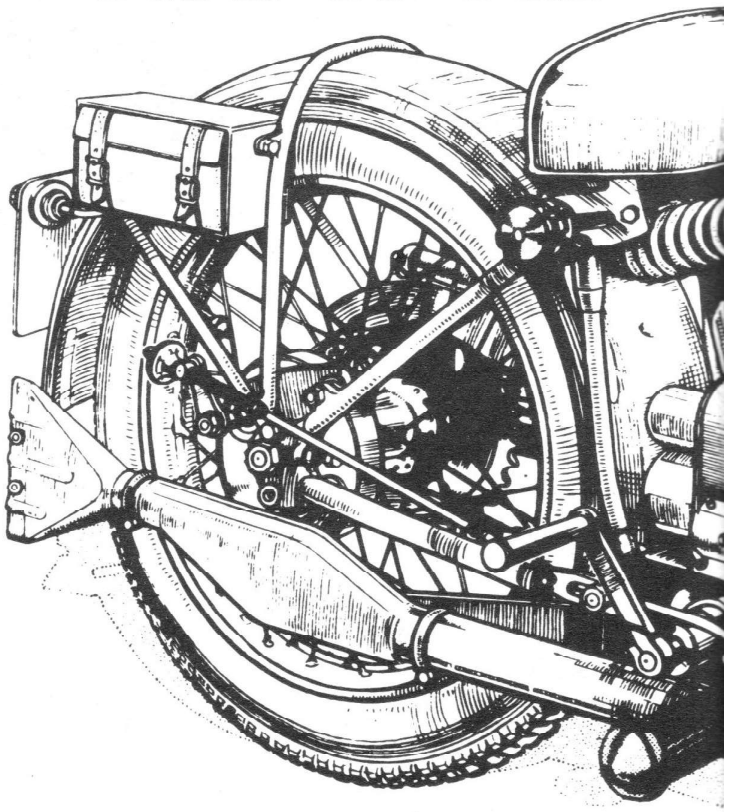



## Matchless dream machines

# The Matchless dream machines

**Daring, innovative, yet showroom failures — such was the fate of the Collier brothers' experiments in narrow-angle V-twins and V4s in the thirties.**
**Story by Peter Watson**
**Silver Hawk cover illustration by Bill Bennett**



ON OCTOBER 24 1929 thirteen million shares changed hands on the New York stock market. Five days later Wall Street witnessed the unimaginable — sixteen million shares were traded in a single day. The Great Crash of '29 had begun, and by November 13 thirty billion dollars had been wiped off the value of company stock quoted on the New York exchange.

It was hardly the moment to launch a new motorcycle, unless you planned to make it almost indescribably inexpensive. And the next year would prove to be just as inopportune a time. By 1933, well by that date manufacturers would be so desperate that you would find one — Phelon & Moore of Cleckheaton — making a 250 to sell at £28 17s 6d.

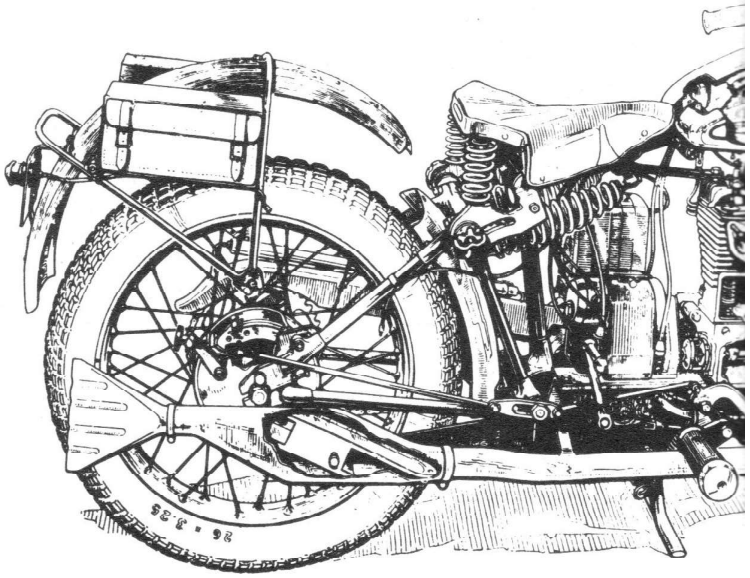
And yet you will look without success in the columns of the contemporary motorcycle press for the merest reflection of 1929's cataclysmic events and the growing havoc of financial, economic and social mayhem that they drew in their train. Within covers of green or blue lay a different, more tangible world with its own concerns. Motorcyclists were keyed up for a positive deluge of new, innovative models. Change was in the air.

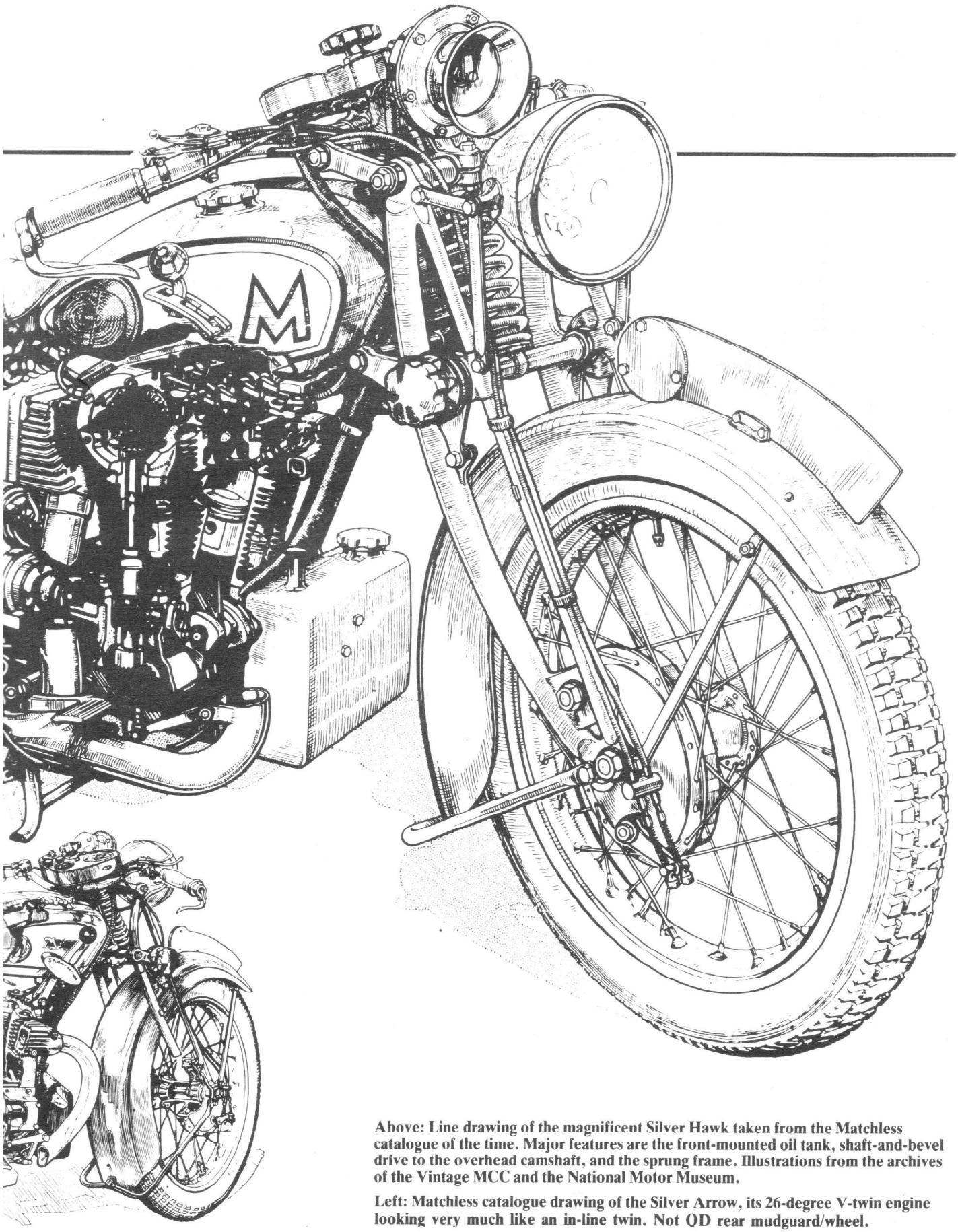
Today the news would have rated a few 'Scoop' and 'Exclusive' headline tags, but on September 5 1929 *The Motor Cycle* coyly whetted its readers' appetite for the Olympia motorcycle show coming at the end of November with a discreet little sentence. 'Several famous manufacturers are busy perfecting four-cylinder engines with a view to having them in production by 1931 at the latest,' uttered the Blue 'un with Delphic confidence.

The race was on between Ariel at Selly Oak in Birmingham, where Edward Turner was working on a design based on two vertical twins geared together, and the Collier brothers at Plumstead in south London, who had opted for a narrow-angle V4. The press was privy to these otherwise secret developments, but that tantalising sentence in *The Motor Cycle* was about as far as the terms of their carefully defined relationship with the motorcycle maker would allow them to go.

When the Olympia show opened its doors on November 30, it looked very much as if Matchless and the Colliers had passed the finishing post first with their four. 'At first glance,' ran *The Motor Cycle's* report of the Silver Arrow 'anyone might take the new 400cc Matchless for a very compact, straight four-cylinder.' And so they might, were they expecting to see one. Otherwise you might have taken the large monobloc barrel casting to contain an in-line or even parallel twin. In fact it was a cleverly disguised 26-degree side-valve V-twin.

Never the most shy of publicists, Matchless described the

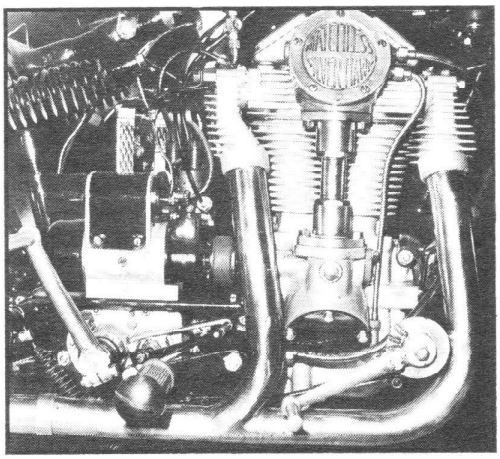


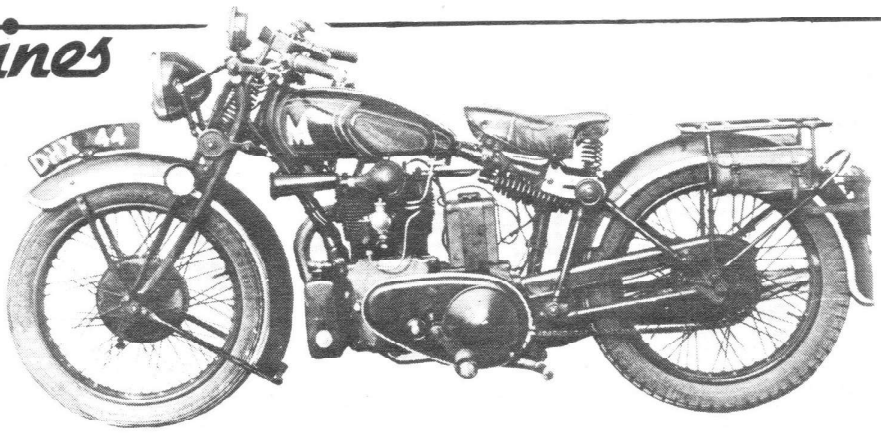


**Above: Line drawing of the magnificent Silver Hawk taken from the Matchless catalogue of the time. Major features are the front-mounted oil tank, shaft-and-bevel drive to the overhead camshaft, and the sprung frame. Illustrations from the archives of the Vintage MCC and the National Motor Museum.**

**Left: Matchless catalogue drawing of the Silver Arrow, its 26-degree V-twin engine looking very much like an in-line twin. Not QD rear mudguard/wheel.**

# The Matchless dream machines





**Above: Who would have guessed from the Hawk's demure left-side profile that it was powered by an exciting V4 engine?**
**Left: Some Hawks were made with a hand-operated gearbox, other models with a foot change. This 1931 version has the latter option.**

Charlie Collier-designed Silver Arrow as 'The Most Remarkable Motorcycle Ever Produced', and it did have some noteworthy features for all that. Coupled with a hand-change, three-speed, Sturmey-Archer gearbox, the long stroke (54x86mm) 397cc engine came in a very mild state of tune and was just capable of propelling the Silver Arrow's 340lb to 63mph, flat out. The 16bhp twin featured a crankshaft running across the frame, with a skew-geared camshaft above it, lying fore and aft. The valves and exhaust ports lay on the right, with both ports leading into a single cast-iron finned manifold. On the opposite side was bolted a single carburettor, feeding both cylinders via a passage between them which, according to *The Motor Cycle*, both cooled them and pre-heated the charge.

Other engine details revealed a Magdyno driven from the rear of the camshaft via an exposed, rubber block universal joint, with the latest Matchless dry-sump oiling system with a four-pint tank bolted low down in front of the crankcase. The press commended the lack of external oil pipes so common at the time on other machines; the slightly offset big-ends featured roller bearings, with another roller bearing for the drive side of the crankshaft and a plain bush on the timing side.

After the engine, the most remarkable features were coupled brakes and a spring frame. Not that we should forget the chromium-plated fuel tank, for this was chrome plating's first year, replacing the truly 'vintage' look of dull nickel plating. It was welcomed, at first only on sports and de luxe models, with a delight that seems difficult to credit fifty years on.

Both front and rear brakes were coupled by cable and rod from the normal rear brake pedal on the right, although you could over-ride this by operating the front drum's own handlebar lever. Quite a few manufacturers — notably Rudge and BSA — had been experimenting with coupled brakes on production machines. With cable operation it could never be very successful and although Rudge persisted doggedly, other makers dropped the idea. It was to be left to Moto Guzzi in the age of hydraulic actuation to prove just how sensible this basic concept has always been.

So, too, the Arrow's triangulated sprung-frame rear suspension was an idea ahead of its time and hydraulic damping technology. There was, as Philip Vincent pointed out in his autobiography, *PCV*, a great deal of consumer resistance to the idea of a sprung frame in the late twenties and thirties. It is hardly surprising that there was this fear of the sprung frame's effect on handling, especially if you consider the design of the Matchless Bentley and Draper-type rear suspension.

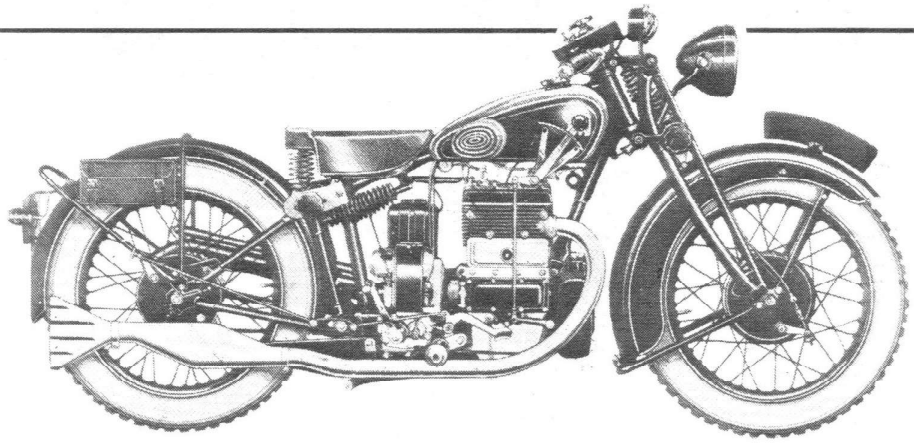
This type of sprung frame — also employed by Brough Superior for a time — featured a fully triangulated rear fork pivoting on Silentbloc bushes, with a compression spring on either side of the sprung saddle. A pair of slotted plates doubling as saddle spring mounts had primitive adjustable friction dampers bearing upon them from either side, and right at the end of the tank rail there was a massive T-lug carrying two rubber buffers to act as bump-stops.

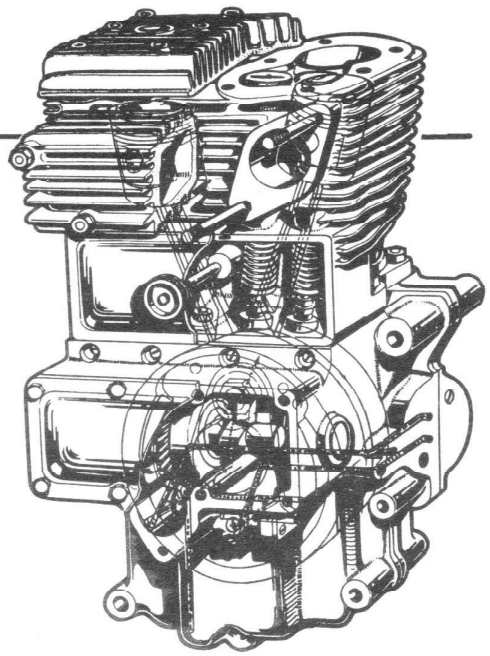
As Philip Vincent said, he soon discontinued the use of a similar design, 'because to mind it was excessively complicated and incorporated far too many bush bearings which, from what I had heard people talking about parallel linked forks, sounded like a lot of trouble lain in the future, when the bushes and spindles wore'. And, of course, he was right. It is also obvious that once the initial stiction of the friction damping plates is broken — as it so easily is — you are relying for spring damping on nothing more than friction at the pivot bushes. In other words, hit a series of big bumps going fast and you will probably bounce all over the road. However, where 'a real endeavour has been made to provide an extremely comfortable machine of great docility,' as *The Motor Cycle* outlined the Arrow's design parameters, it probably didn't really matter. On an 80mph machine the effects of hitting a bump at speed would probably be reminiscent of the behaviour of Britain's early steam-powered submarines, in one of which the Captain is reported to have said to his First Lieutenant, 'This end's diving, Number One. What's yours doing?'

Quiet, slow and staid though the Arrow was, it sold fairly well during the 1930 season, when riders in search of refinement and gentility bought slightly less than 1,500 of what was to prove to be a total production run of under 2,000. At £55 it was by no means cheap, but not especially pricey, either, when you could have a Norton Model 18 for £59 10s or an overhead cam CS1 for £77 10s.

For the 1930 Olympia show the smoothly silent Silver Arrow appeared with deeper head finning (it not unnaturally ran rather hot), a new fuel tank and a four-speed Sturmey-Archer gearbox. But it's doubtful if anyone gave it more than a second glance, for the rumoured fours, in the shape of Ariel's Square Four and the Matchless Silver Hawk, had arrived at last.

Under a headline that read 'Progress Leaps Forward' (one wonders in which other direction it might have flung itself), 'Ubique' of *The Motor Cycle* set to with a will, first pausing to congratulate himself and the rest of the technical press for starting the ball rolling towards this magnificent efflux of technical wizardry. 'The vee-four Matchless is a neat piece of work,' continued 'Ubique', 'and the logical outcome of the Silver Arrow.' For Charlie Collier's brother Bert, who designed the Hawk, had virtually taken two Silver Arrow twins and set them side by side, with a crankshaft running across the frame. It made for a four almost as compact as Turner's Ariel.





**Above: Despite its intriguing specification, the 400cc Silver Arrow had a top speed of only 63 mph.**

**Right: Engine drawing of the Silver Arrow shows the monobloc casting of the two cylinders. Camshaft runs fore and aft and is driven by skew gears.**

Retaining many of the Arrow's features such as coupled 8in brakes, rear springing, dry-sump lubrication with that front-mounted oil tank and the same electrical drive layout, the Hawk nevertheless possessed many features that clearly set it apart from its humble predecessor. According to *The Motor Cycle*, the Hawk's designer had 'aimed at producing a machine which combines docility, silence, smooth running and comfort with a really high road performance; thus one finds the claim for the finished machine of a top-gear range from 6 to over 80 miles an hour.'

Like Turner's Ariel, the Matchless was a single overhead cam four, but in its case the camshaft drive was by shaft and bevel gears — with two Oldham couplings— instead of chain. Both Ariel and Matchless valve trains tended to be noisy in use. In both cases the cylinders and heads were cast as single units, with air spaces around the barrels and an induction system claimed to provide an equal amount of petrol and air to each cylinder from a single, offside-mounted carburettor. Straight-arm rockers operated the Hawk's eight 1 1/16in parallel valves, while the heads were oval to accommodate both valves and sparking plug in such a small space. At the front and back of the cylinder block finned manifolds channelled exhaust gases from all four exhaust ports into two exhaust pipes on the right of the motor. These joined up to finish in a single fishtail silencer. Like the Arrow — and the Square Four, for that matter — the Hawk's head tended to overheat when the motor was used hard, and subsequent enlargement of the air spaces around the exhaust manifolds failed to solve the problem.

Decidedly superior to the Ariel design, the Hawk's two-throw, built-up crankshaft featured a central roller bearing as well as two plain bushes, making for a commendably stiff assembly. Arrow-type roller big ends, two-ring alloy pistons and plain gudgeon pins completed the picture. With a bore and stroke of 50.8 x 73mm, the Hawk was a 597cc '600' to the Square Four's 497cc, giving it a definite capacity edge on its rival.

Although it had a four-speed hand-change gearbox similar to the Arrow's latest equipment, the Hawk's primary drive was rather different. Instead of a single-row 7/16in primary chain, the Hawk had a 3/8in duplex primary drive, tensioned automatically on both top and bottom runs by Weller-type spring-steel blades. The skew-gear drive to the electrics retained the Arrow's exposed rubber-block joint, but in the Hawk's case the drive was taken from the camshaft spindle, while it featured coil ignition, with a car-type dynamo and distributor behind the cylinder block.

At the heart of the Hawk's lubrication system lay the famous gear-driven rotating and reciprocating plunger oil pump. Driven off the crankshaft, it drew oil from the front-mounted tank and fed some direct to the big-ends and main bearings, while the rest went to the top bevel of the camshaft drive via a sight feed tell-tale on the neat Matchless instrument panel. Oil from the bevel chamber then overflowed into the cam box, lubricating the rockers before it returned to the tank, a small amount being diverted to the primary chain via a needle-controlled bypass.

If the Hawk's technical specification sounded so good, why them was a total of only about 550 sold between 1931 and 1935, when it went out of production? And why did consumer interest in the Arrow fall off so sharply that it was only in production for three years? The opening paragraph of this story is obviously the basic answer to such questions — both machines were too expensive, at a time when just to have a job, never mind a well paid one, was quite an achievement.

Yet while the Arrow might be a decidedly boring £55's worth, both the Hawk and the Square Four lived up to their reputations as 'inexpensive' fours when compared with the two in-line Americans on the British market. At the 1930 Show the 1,301cc and 1,265cc ioe Henderson and Indian were being advertised at £130 and £125 respectively, while the Hawk was £75 and the Ariel £70. And why did the Hawk die after so brief a span, while the Square Four continued in production for over 25 years?

The answer to that one is, of course, is that it was not the same Ariel that was being offered for all those years. The machine may have retained the basic layout of Turner's original 4F, but the extensively redesigned 997cc pushrod four that rumbled on into the late 1950s was a very different animal. It is difficult to say who was right at the end of the day — the Colliers for shutting Hawk production down, or Ariel for continuing to spend money on modifying a model which was always expensive to produce and sold in relatively few numbers considering the length of time it remained on the market.

The Depression struck a cruel blow right at the heart of motorcycle design. Although hampered by the restrictions of the basic raw materials with which they had to work, designers were coming up with the type of solutions which were to dramatically expand the motorcycle market in the 1960s and '70s. Beaten back by economic depression and then the Second World War, they were forced to continue turning out the same old singles and twins.

Both the Matchless Silver Arrow and the Silver Hawk tend to be relatively unknown today. As showroom failures, perhaps that is inevitable. Conditioned by the sight of so many AMC singles, many people find it hard to credit that a company like Matchless could have had a V4 in production in 1930. But fifty years on the story of the Matchless dream machines is still as exciting as it must have been to join the crowd at Olympia a half century ago.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Matchless
Matchless Silver Arrow