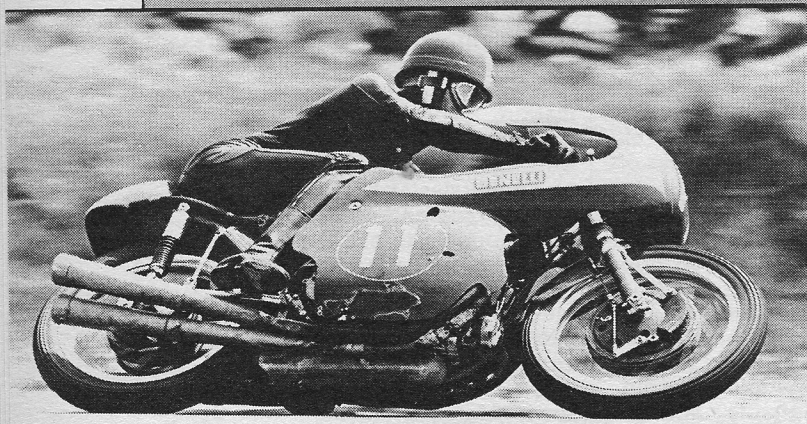
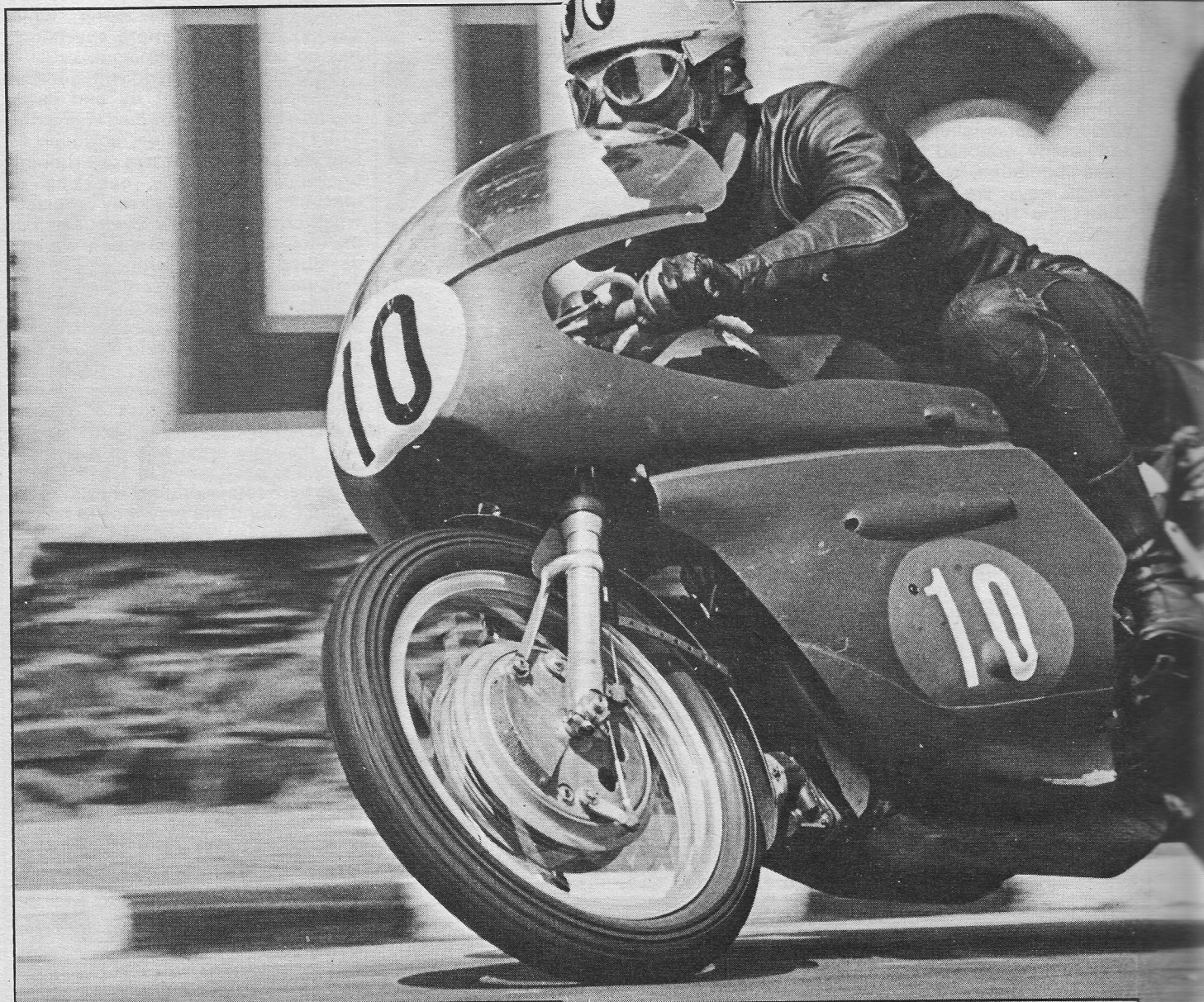
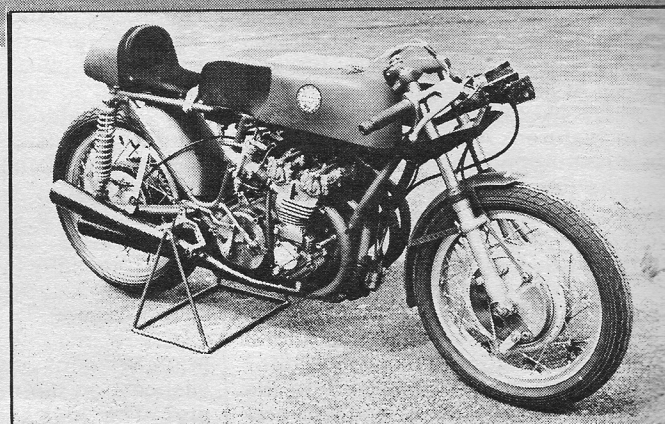


Benelli's racing



'Old Elbows' Tarquinio Provini and the Benelli four — a dashing combination.

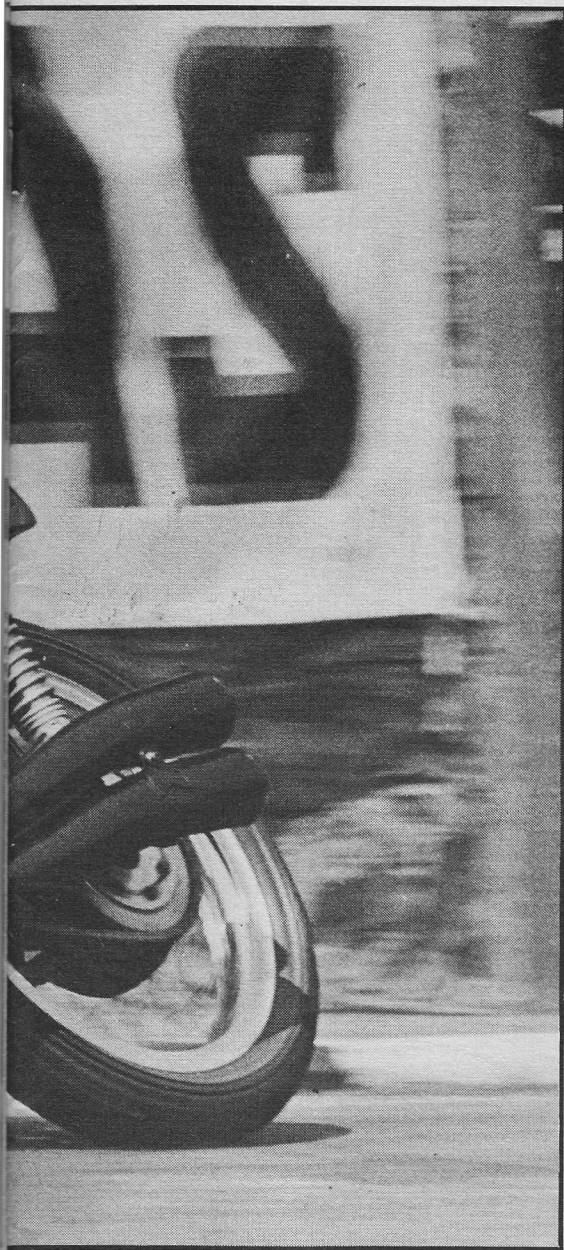


The mighty 500cc Benelli which was raced twice by Mike Hailwood.

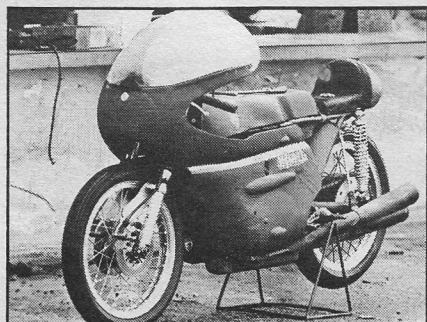
fours

Benelli's efforts at winning a world title with a multi were dashed by the FIM in 1946, but Charlie Rous shows how the factory's persistence was finally rewarded more than 20 years later.

Photos courtesy Motor Cycle News.



Above: Renzo Pasolini guns the 350cc Benelli four in the 1967 Junior TT.



This 1965 version of the 250 featured diminutive twin discs at the front.

ALTHOUGH Honda astonished the racing brains of Europe by revealing a 250cc racing four in 1960, they were by no means the first to design a quarter-litre multi. The pattern was set in Italy in 1939, when Benelli and Gilera produced 250cc dohc fours which, with supercharging, were intended to give more than 60bhp.

Gilera got no further than making an air-cooled engine, but a water-cooled Benelli was built, although it never raced due to the FIM's ban on blowing in 1946. Designed by Giovanni Benelli, one of five brothers who founded the Pesaro factory in 1913, the bike was tested in unsupercharged form, but in this state was no match for the company's 30bhp unblown double-knocker single on which Ted Mellors had won the 1939 Lightweight TT.

Despite this pre-war success, Benelli's single-cylinder 250 had generally been eclipsed during 1938-39 by supercharged opposition — notably the German DKW two-stroke twin and the Moto Guzzi single. In fact, Benelli fitted a blower to their single and boosted its performance to 45bhp and 125mph — but their plan for 1940 was a blown four!

But with the 1946 ban on supercharging, the 110mph unblown single returned to prominence and, after initial post-war success by Moto Guzzi, became established as the fastest 250 when Dario Ambrosini won the 1950 world title.

Sadly, Ambrosini was killed while practising for the French GP at Albi in 1951, and his death hit the Benelli brothers very hard. They formed an extremely close family and treated Dario very much as one of their own. This attitude was a notable feature of Benelli racing policy. They much preferred to support one or two riders with the best possible machines, rather than run a large and impersonal team with loyalty bound only by annual contracts.

After leaving AJS for MV in 1951, the late Les Graham supplemented his 500cc MV rides with a Reg Dearden 350 Velocette and the 250 works Benelli. But little came from the latter arrangement, for Ambrosini's death all but extinguished Benelli's enthusiasm. Little was heard of the factory for several years while other Italian teams — Gilera, Guzzi, Mondial and Morini — captured the top riders. Nonetheless, development continued until 1959 and the bike remained a respected threat throughout its existence. Significantly, Geoff Duke rode a 250 Benelli single to victory in his last racing appearance, when he also won the 350 and 500cc races on Nortons at the 1959 (non-classic) Swedish GP.

During 1958-60, MV dominated every solo class, although in 1960 the first European appearance of the 250 Honda fours saw these Japanese machines (quite different from the 1959 originals) finish the world title pursuit at Agusta's heels. The following year, Honda gained both the 125 and 250cc world championships, while MV withdrew their challenge from these classes.

But not so Benelli, who responded to the Oriental threat and gained enormous publicity by revealing a totally new four-cylinder 250 in June 1960. Its surprise announcement came as a magnificently timed stunt which brought them from obscurity to headlines overnight. On the day of its launching, Silvio Grassetti demonstrated the new bike impressively with four open megaphones blaring out a mighty challenge.

As in 1939, the new engine was the inspiration of Giovanni Benelli who, with Ing Savelli in charge of the racing department, recalled his pre-war original, for the new machine was built in less than six months. However, proof that the new machine was far from ready at the time of its announcement was indicated by nearly two years elapsing before it was wheeled out for its first race at Imola in 1962.

Nonetheless, the Pesaro engineers had worked efficiently, for although the bike was ridden by the then comparatively inexperienced Grassetti, he offered a strong challenge to Tarquinio Provini on the single-cylinder Morini. Grassetti was beaten only by his own youthful exuberance, when he missed a gear and bounced a valve.

One week later at Cesenatico, Grassetti made no mistakes and beat both Jim Redman and the late Tom Phillis on their works Honda fours. Grassetti was still menacing the following weekend when he challenged the entire Honda squad at the Spanish GP and held third place until his engine went sour with ignition trouble.

Where the pre-war water-cooled engine had been built with 42×45 mm bore and stroke dimensions, the air-cooled 1960 motor was over-square at 44×40.6 mm (246.8cc). The first version was said to produce 40bhp at 12,000rpm. Compression ratio was 10.5:1. Cast-iron cylinders were subsequently changed for four separate light-alloy barrels, with the light-alloy cylinder heads being cast in pairs, with two-valve combustion chambers. Double overhead camshafts were gear driven from the centre of the crankshaft, with geared primary transmission being taken from between the first and second nearside journals.

A distinctive feature of that first

Benelli's racing fours

version was its upright engine, which omitted a sump. Oil was carried in a tank beneath the seat, but this container was subsequently relocated in front of the bulbous fuel tank in an unsuccessful attempt to aid oil cooling. The machine weighed 264lb. The engine later adopted a long, slim electron oil sump which served the double purpose of solving the cooling problem and improving the handling by lowering the centre of gravity.

The failure at the 1962 Spanish GP had been caused by erratic timing at high rpm. The initial ignition equipment consisted of a coil and battery system with a four-lobe contact on the left end of the inlet camshaft. This was satisfactory

until the engine was revved hard and the contact points 'floated'. The problem was cured by fitting a bevel-driven Lucas racing magneto in front of the crankcase, but the drive to this also failed later, eliminating the bike from the Italian GP.

Development advanced swiftly after Provini joined Benelli at the end of 1963. A new frame and fuel tank lowered the height, and further pruning dropped the weight to 247lb. By then the engine was giving 52bhp at 16,000rpm, and the original six-speed gearbox had sprouted a seventh ratio. Maximum speed was reckoned to be over 140mph with everything happening from about 8,500rpm onwards.

A particularly interesting feature of the engine was its one-piece crank-cum-gearbox housing. This was a light, but immensely strong electron casing with the crankshaft assembly and transmission internals slotted in through holes at each side, with cover-plates locating the outer bearings. About this time too, the Lucas magneto was changed for a unit from an American four-cylinder marine racing two-stroke engine. These improvements, along with the forceful riding of 'Old Elbows' — Provini's nickname — resulted in a successful

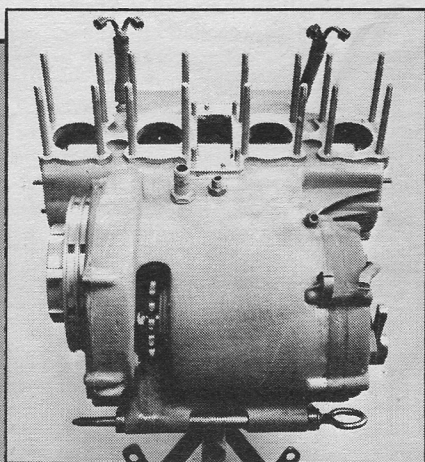
season. Benelli won every event in the 1964 250cc Italian championship.

Most apparent modification for 1965 was the adoption of a twin-disc, hydraulically operated, front brake to cope with still more engine power — which also warranted an eight-speed gearbox. In 1965, too, Benelli also produced a 350cc (322cc) version by fitting 50mm bore cylinders on a 250cc bottom-half. This engine gave 53bhp at 14,700rpm and also featured four-valve cylinder heads.

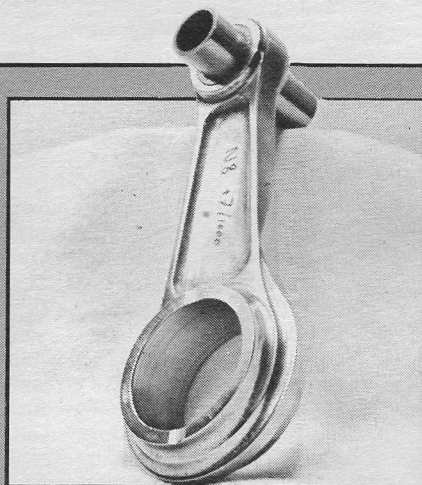
During this mid-sixties period, the 250 and 350cc battles between Honda, Yamaha and MV were extreme and although Benelli were unable to mount a sustained challenge in the classics, their morale was boosted when Provini won the 1965 Italian GP at Monza.

The factory began production of a 500cc four, and even had plans for an eight-cylinder 250! But Benelli's interest in racing was again dimmed by an accident, when Provini crashed while practising for the 1966 TT and sustained spinal injuries which finished him in racing.

However, under the guidance of Paolo Benelli and his cousin, Count Nardi Dei, enthusiasm later returned and Rovini's machines were taken over by Renzo Pasolini, who was later joined by the

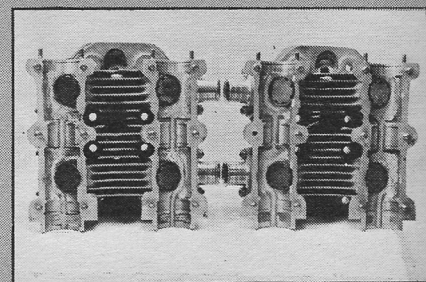


Crankcase seen from behind; note final drive pinion inboard of the clutch.

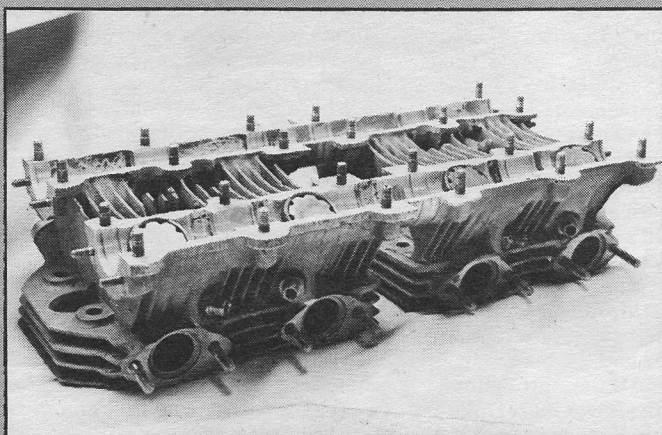


Con rods were robust; big-ends used caged-roller bearings.

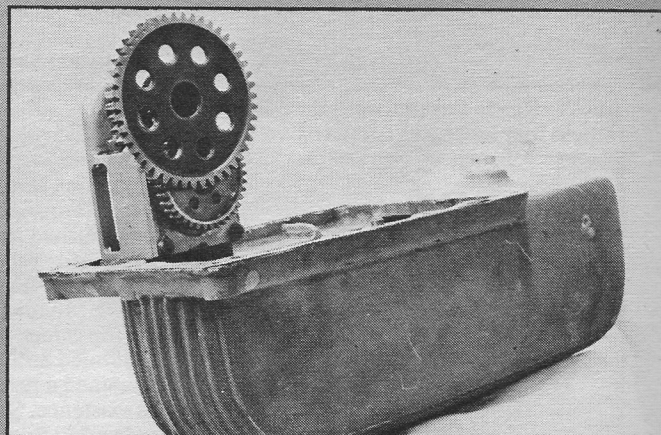
Inside the



Looking down on the cylinder heads; inlet ducts were only slightly inclined.



Cylinder heads with shallow finning were cast in light alloy. This version of the engine was said to give 40bhp.



Light alloy sump, which was screwed to the crankcase, and oil pump gears. Good oil cooling was a Benelli feature.

Australian, Kel Carruthers. In 1968 Pasolini gained second places in both the 250 and 350cc TTs behind Bill Ivy (Yamaha) and Giacomo Agostini (MV).

Then Benelli took advantage of the absence of the works Yamahas to recruit Carruthers and Phil Read for the 1979 TT. Carruthers won by more than 3½ minutes from Frank Perris (Crooks Suzuki) at 95.95mph. Read retired and did not ride the Benelli again, but Carruthers and Pasolini each won three classic victories that season and finished first and second in the world championship. This gave Benelli their second manufacturer's world title.

Carruthers, who is now the driving force behind Kenny Roberts' Yamaha challenge in today's GP racing, told me at Silverstone during last summer's Marlboro British GP that he mainly rode the two-valve 250 Benelli, while Pasolini had a four-valve machine. 'But when it looked as if I had the best chance for the world title, they gave me the four-valve bike — and that settled it for, because it was faster', he said.

'They were really great little bikes and looked forward to racing them in 1970. But that never really came. There was a massive strike in Italy and everything stopped. By the time they started to think about racing again, I had made my own

plans for a 250 Yamaha.'

Carruthers did, however, score two second places on the 350cc Benelli in the early GPs of 1970 before switching entirely to the rapidly improving two-strokes. Pasolini maintained Benelli's support in the 350 class and scored three seconds and a third place, to take third place in the 1970 championship.

By that time the 16-valve 350 and the 500 four were extremely competitive, and it was the Benelli challenge, in addition to pressure from the Yamaha twins, that persuaded MV to re-introduce four-cylinder machines to take over from the threes they had raced since 1965.

Indeed, after Mike Hailwood left Honda at the end of 1967, he was offered a 500 MV for the 1968 Italian GP — provided he rode in second place to Agostini. This annoyed Hailwood so much that he went straight to Benelli and asked them for a bike on which he could win the race!

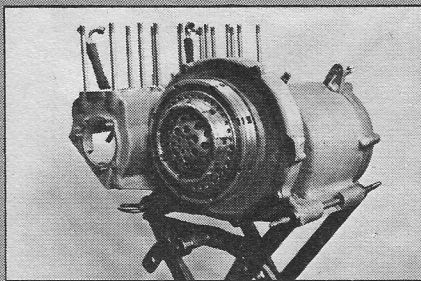
Benelli were delighted, and after lapping faster than Agostini in practice. Hailwood was challenging for the lead in the race when, on lap three, the front brake locked on a wet patch of the track and he crashed. Mike did in fact race a 500 Benelli again, at Pesaro, but he again suffered brake trouble.

Benelli family control of the business was by then wavering, and it was taken over by the Argentinian millionaire industrialist, Allesandro de Tomaso, and development of the racing machines declined. Despite this, the factory tried to continue and sensation came when that great Finnish rider, the late Jarno Saarinen, made his debut on the 350 and 500cc Benellis at Pesaro in 1972. He won both events, while Agostini ran into wholesale trouble on the MVs.

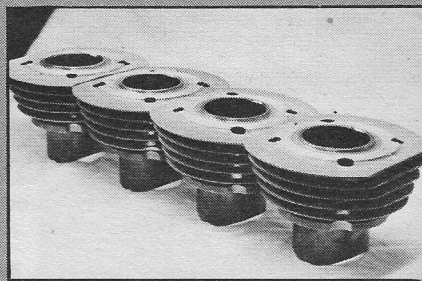
Ironically, a 350cc Benelli featured in the tragic day at Monza in 1973 when both Saarinen, on a Yamaha, and Pasolini, on a works Harley-Davidson, were killed. Walter Villa's factory Benelli left a trail of oil as it finished fifth in the 350cc race, and when track marshals failed to clear the mess, it caused the infamous mass pile-up in the following 250cc race.

Benelli's withdrawal from racing was caused by the dominance of two-stroke designs in the GPs, and by FIM rules which limited 250cc engines to two cylinders and six gears. But the surprise echoed in many quarters when the factory began to produce its present range of multi-cylinder roadsters, including a six, was really unnecessary. History shows that Benelli have a long tradition of making multis.

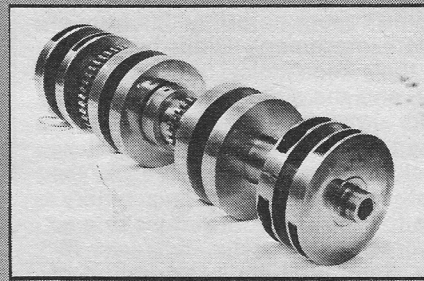
1962 Benelli 250-4



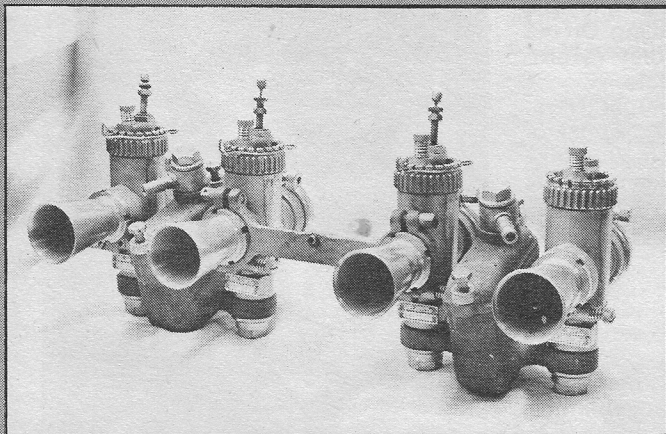
The crankcase was a one-piece casting in electron.



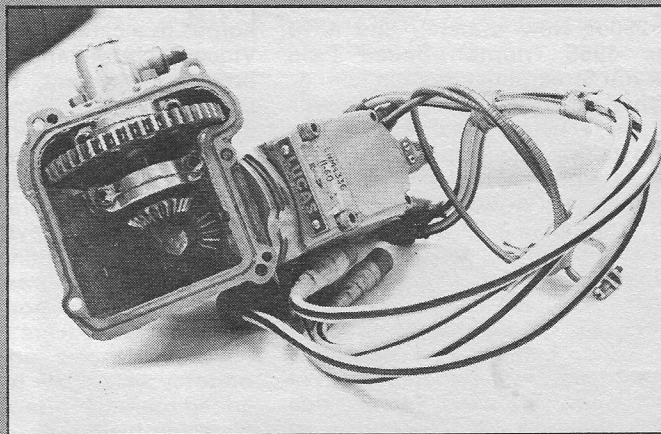
Cylinders were cast in light alloy, with shrunk-in iron liners.



The crankshaft, with central gear drive for timing gears, magneto and oil pump.



Four Dell'Orto carburetors shared two flat-type float chambers. Choke diameter was 20mm.



Magneto and its driving gears; drive was taken from central gear on the crank. Lucas mag sat in front of the engine.