

BEFORE THIS YEAR'S Indianapolis race I predicted that if the new lightweight rear-engined cars could lap at average speeds around 144 mph for 500 miles—on two sets of tires—one of them could easily win the race. This would mean one pit stop, compared with three for the heavier Meyer-Drake Offenhauser roadsters. The time saved should have more than compensated for the slower lap speed.

As it turned out, Jim Clark actually lapped most of the time between 146 and 150 mph in his Lotus-Ford—and still skinned by on one pit stop. But he didn't win the race. Parnelli Jones beat him by some 34 sec. with lap speeds between 148 and 151 mph, making three pit stops. But Jones had Lady Luck on his side; he was able to make two of his three stops when the field was running at slow speeds under the caution flag. Each of these stops cost him only 10 to 20 sec. in total race time, instead of the usual 50-60 sec. for a quick stop when the field is running at full speed. This made the difference. If Jones had made all three of his stops under the green flag, Clark would very likely have won the race. However, don't take anything away from Parnelli Jones or the magnificent performance of the Agajanian-Willard team and head mechanic Johnny Pouelsen. They well deserved the win.

And I think you'll find that an object lesson "took" with the American racing fraternity. The 1600-lb. front-engined Offenhauser-powered roadster is obsolete—as of 3:00 p.m. May 30, 1963. It has been conclusively proved that an 1100-lb. car, whether front or rear-engined, can run the 500 miles

on two sets of the available 15-in. Firestone Indy tires—without sacrificing more than 2 mph in lap speed to the heavier Offys making three pit stops. Tire wear is that much less on the lighter cars. That difference in lap speed won't compensate for the extra time lost in the pits for the heavy cars, assuming that the stops are made when the field is running at full speed under the green flag.

This doesn't mean we won't see any more conventional Offy roadsters at Indianapolis. But they'll be racing on luck. Radical changes will need to be made in the Offenhauser-powered racing car to compete with the lightweight rear-engined machine—whether American or foreign. Before the Indianapolis asphalt was cold last May 30, dozens of American race car designers and mechanics were bugging Chevrolet and Ford officials to buy aluminum versions of their passenger car V-8 engines. These are at least 100 lb. lighter than the Offenhauser and the reduced torque and vibration permit considerably lighter chassis and running gear. The overall weight saving can be anywhere from 300 to 500 lb. This is apparently what it's going to take to win future Indianapolis races.

Certainly tires were the most important factor in this year's race. The story here starts back last winter. Firestone officials anticipated a rash of new lightweight cars and knew their conventional 16 and 18-in. tires would be entirely unsuitable. Mickey Thompson had used 16-in. tires on his light rear-engined cars last year, but these were bigger and heavier than necessary, too. Firestone decided to bring out a new line of 15-inchers. But these things take time and Firestone had only prototypes available

when the Lotus-Fords were testing at Indianapolis in March. This is when Dan Gurney lapped at 150.5 mph on the soft Dunlop 15-in. tires. He turned 148 on the harder Firestones, so Firestone went ahead with the production molds for the new tires. These were ready by mid-April. This gave the tire men time to get a small supply to the track by May 1 for the new lightweight cars.

And this is when the trouble started. The Indianapolis old-timers took one look at the 1.25-in. wider treads on the new tires, and screamed bloody murder. They said the extra rubber would give the small cars a better bite in the turns and thus an unfair advantage on lap speed. They wanted them withdrawn, putting the small cars on current 16-in. sizes (as Thompson had last year).

Firestone, however, wasn't buying. The designers had a perfectly legitimate reason for making the treads wider. Their reasoning was that, to get equivalent tire mileage, the actual mass of rubber in the tread layer should be maintained. Thus the tread width should be increased in the same proportion as the overall diameter is reduced.

Adding fuel to the fire was Firestone's hesitation to approve the smaller tires for use on the heavier Offenhauser-powered cars. The tires had been specifically designed for cars in the 1000-1200 lb. range and had never been tested under the higher loads. It was the second week of May before they could get reliable tread temperature checks at really high lap speeds on a heavy Offy. (This is the way they check for dangerous tire loading.) Temperatures ran only about 15° F. higher on the smaller tires, which was

ILLUSTRATION BY BILL NEALE

BY ROGER HUNTINGTON

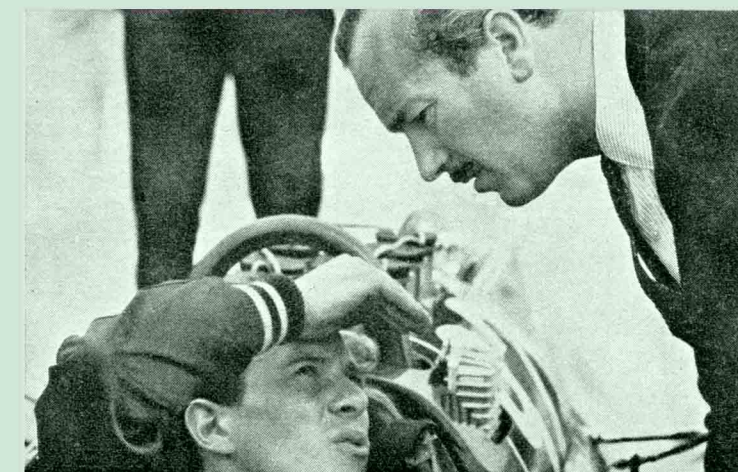
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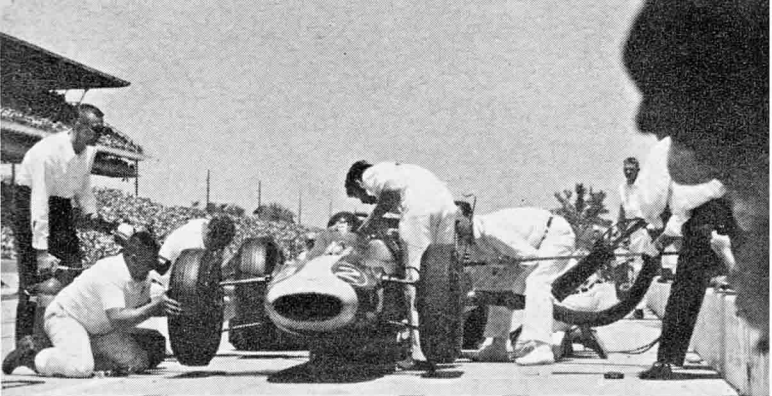
THE DAY THE DINOSAURS DIED

THE HUNTED: Agajanian and Jones survive test.



THE HUNTERS: Clark and Chapman seek big game.

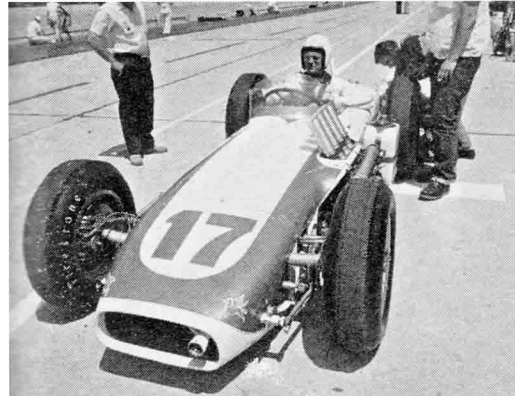




LOTUS-FORD pit action was ragged during race.



HAPPY CREW trots after Jones following 152-mph lap.



RUTTMAN CAR with flat-lying engine.

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well within the safe range. So Firestone and USAC immediately approved the 15-inchers for the big cars. About two-thirds of the car owners grabbed them. It took some quick and dirty cobbling on brake calipers and suspension arms to get wheel clearance, but by race day 23 of the 33 starting cars were on 15-in. tires.

Did the big cars gain anything with them? This is a very interesting question. There is absolutely no evidence that I know of that the smaller, wider tires added even 1 mph to lap speed. The only driver who was really enthusiastic was Parnelli Jones, who said they gave him 1-2 mph. (He eventually practiced at 153.7 mph on 15-in. rubber.) Most of the other drivers felt it was six of one, half a dozen of the other. But there is little doubt that the smaller tires were giving better mileage on the heavy Offenhausers at a given lap speed. The Agajanian crew said their car could never have gone 500 miles at those lap speeds on three pit stops with the old 16 and 18-in. tires. Evidence points to the fact that the 15-in. jobs were going about 15 laps farther at comparable speeds. The only two front-running cars using

the big tires were Jim McElreath and Bob Marshman. They made their first tire stops at around the 50-lap point—while Jones, Roger McCluskey, Eddie Sachs and Lloyd Ruby, went out to around 65 laps on the 15s. In fact, McCluskey and Ward tried to ease through on two stops, at reduced lap speeds.

So I think we can safely mark off Firestone's 16 and 18-in. tires at this point. One of the big losers will be poor Ted Halibrand—who is sitting on a \$40,000 inventory of 18-in. magnesium wheels! Another factor to consider is that Goodyear will be at Indianapolis next May with a full line of 15-in. tires specifically designed for the Indianapolis track. Goodyear was there this year, feeling out the situation and doing some looking and testing. Competition between Goodyear and Firestone should make for some development in years to come.

A lot of people are wondering if the performance of the conventional Offenhauser roadster can be increased enough to beat the lightweight cars with modified passenger car engines—even with one or two more tire stops. This is a tough question. The Offy enthusiasts are attacking the problem through weight and horsepower. The weight of the Offenhauser engine itself was cut 90 lb. this year by using magnesium castings for cam, block and crankcase covers, gear tower, transmission case, using aluminum for main bearing webs and oil pump, drilling out the crank journals more, etc. The latest Offenhauser 252-cu. in. engine weighs 452 lb. with all accessories, clutch and 2-speed transmission.

And the builders are whacking weight off the car and chassis, too. One sees a lot of magnesium and fiberglass body panels and thinner tubing in the frames. (Paving over the bricks on the front straightaway has per-

mitted chassis with a little less beef.) Ollie Prather saved 40 lb. by completely eliminating the standard multi-disc clutch and 2-speed transmission and replacing them with a Schiefer dragster clutch that can be slipped to

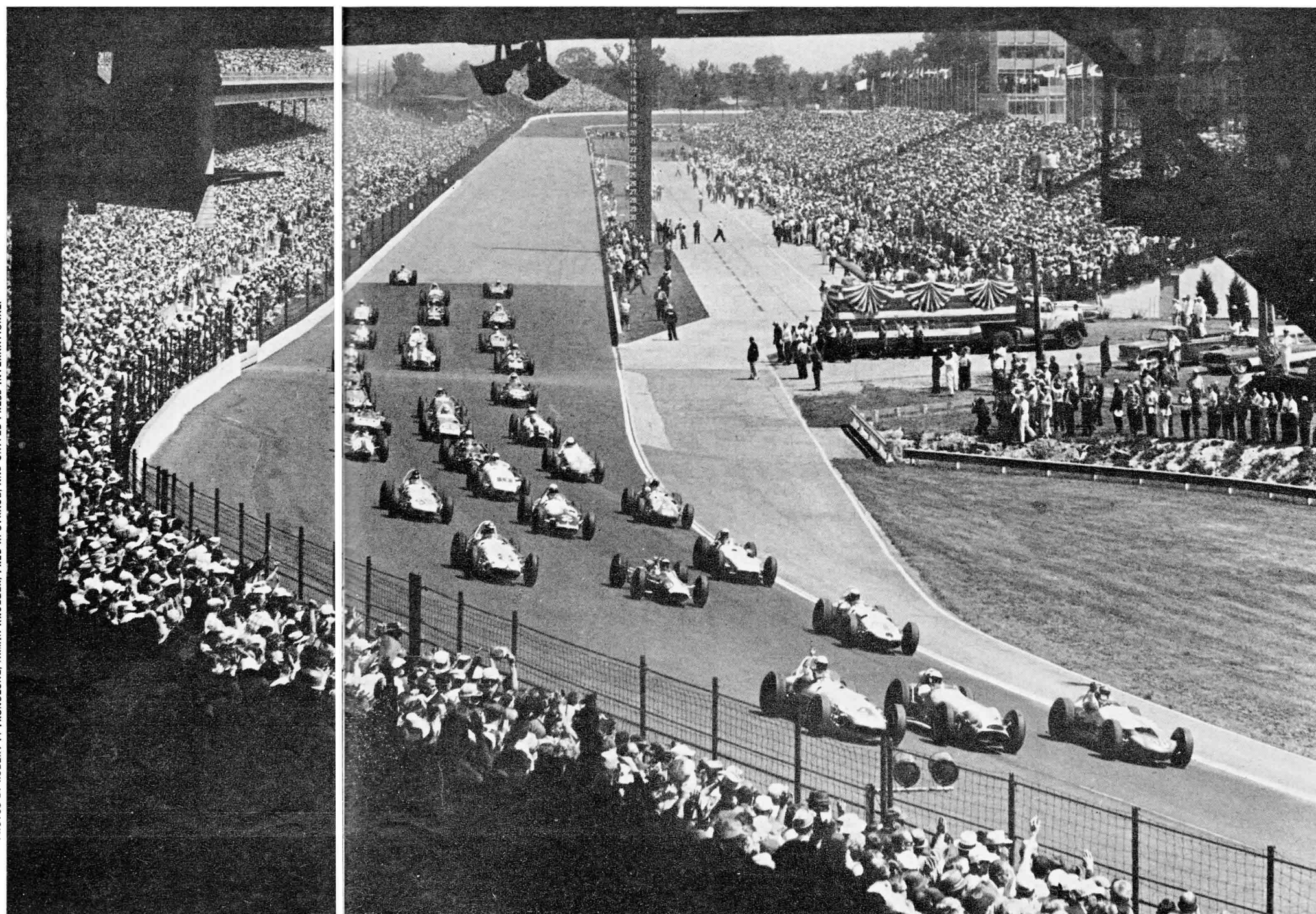
start up out of the pits. A number of cars have saved 5 lb. per wheel with the lighter Airheart disc brakes. Some builders have modified the heavy Halibrand rear end with lighter axle shafts and tubes. One even sees some exotic

parts this year of titanium here and there. There were two Offenhauser-powered roadsters at the speedway this year that weighed less than 1450 lb. dry.

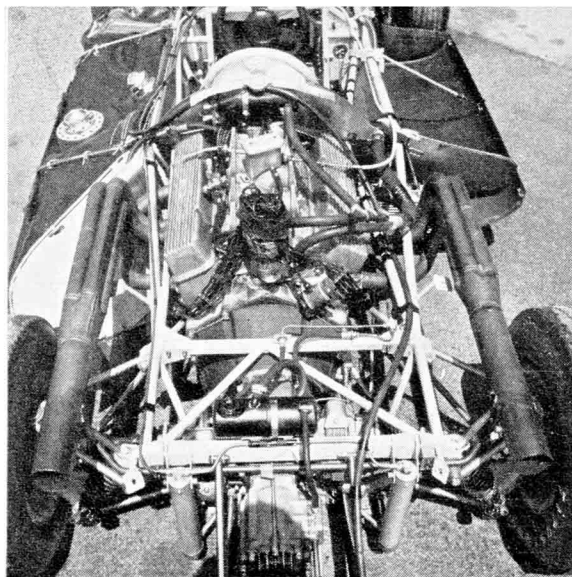
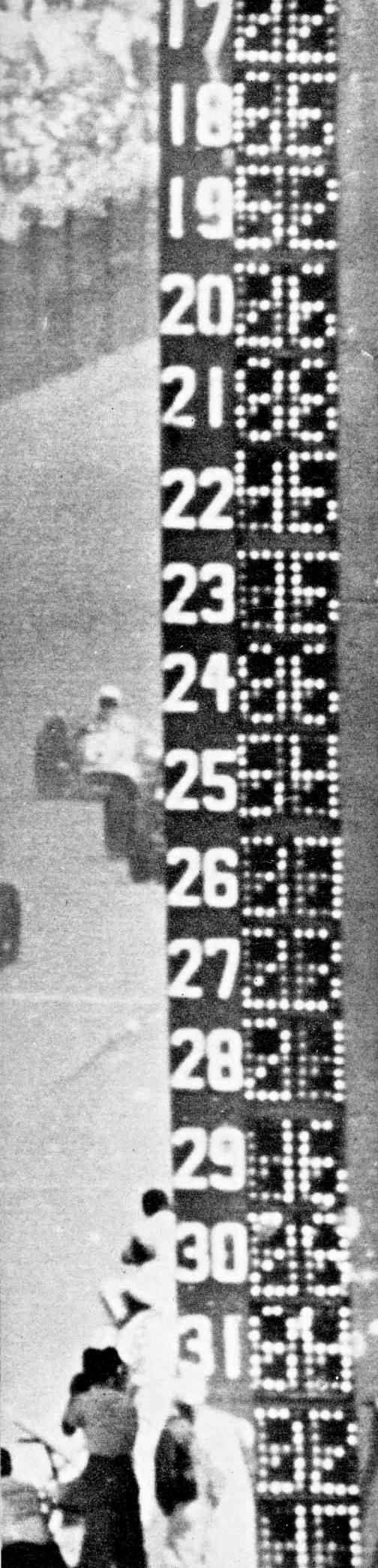
Apparently there's a little more punch left in the old Offenhauser engine, too. Most mechanics agree that fuels and camshafts are the most promising areas for development. The use of 10% nitromethane in methanol was common this year, even for the race. Piston cooling on the Offenhauser is pretty critical for the safe use of 20% nitro; but a number of cars have qualified with this much load. It's good for at least 50 bhp. Beyond nitro the boys get a little evasive. But I'm certain there's much work being done on other exotic blends that run cooler than nitro. Mechanic Herb Porter

claimed 476 bhp at 6000 rpm on a fuel "that would be suitable for a 500-mile race." With 10% nitro, par is between 430 and 450 bhp.

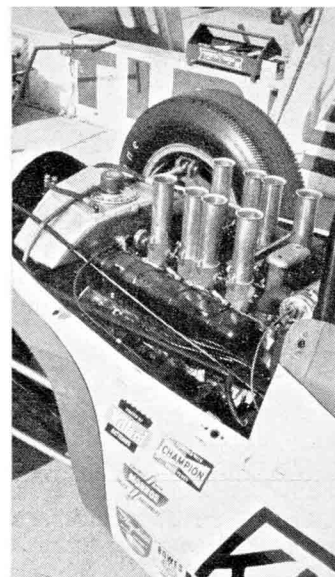
The problem with hotter cam timing is that the crankshaft end of the Offenhauser can't stand revving beyond the peak of the power curve on the straightaways; so, hotter timing often means just lower torque coming off the turns. With a reasonably-hot cam the Offenhauser will reach its peak power at 6700 rpm. This would call for about 7500 rpm peak speed on the straight and around 6000 coming off the turns. But the Offenhauser just won't wind this tight. Most of the mechanics gear to hit about 6800 rpm on the straights, and come off the turns at 5500. Cam timing is adjusted to put the peak of the torque curve be-



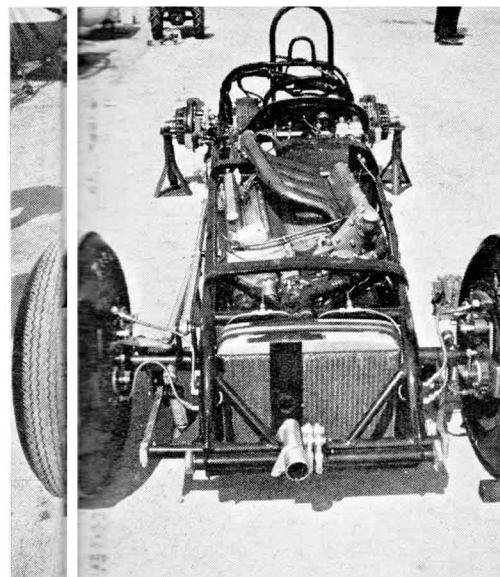
PHOTOS BY ROBERT P. TRONOLONE, ARMIN KRUEGER, FRED H. STRAUB, AND UNITED PRESS INTERNATIONAL.



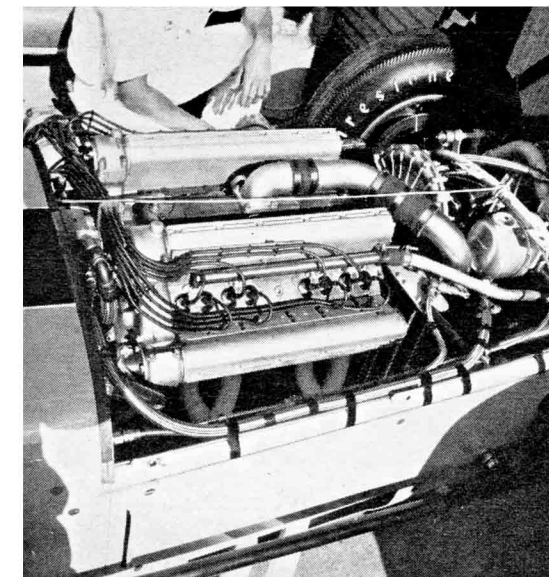
POWER BY: Aluminum Chevrolet for Thompson . . .



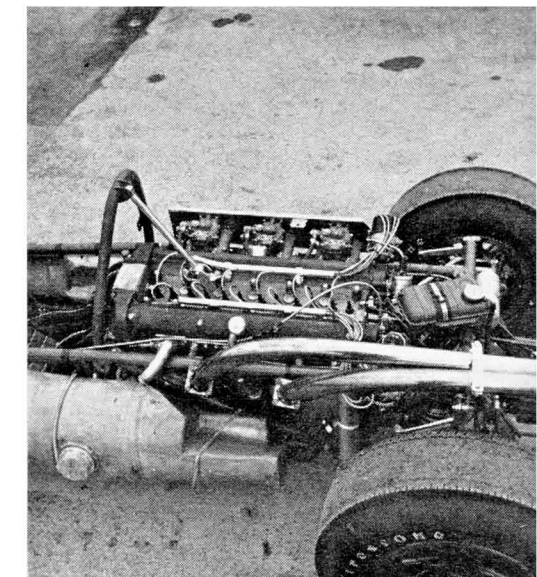
Buick for Kimberly . . .



Offy for Boyd . . .



Supercharged Novi for Unser . . .



Aston Martin in Cooper chassis . . .

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tween 5000 and 5500. In this situation, what good would it do to cam for a power peak at 7000 and torque peak at 6000? Cam durations average only 270 to 280° on the Offenhausers. You never find them more than 300° (which would be considered tame on a hot Super/Stock). The tuners find more success with high lifts and fast opening and closing rates.

Anyway, give a few sharp mechanics like A. J. Watson about 475-500 bhp and dry weights of 1400 lb. to work with . . . and the "obsolete"

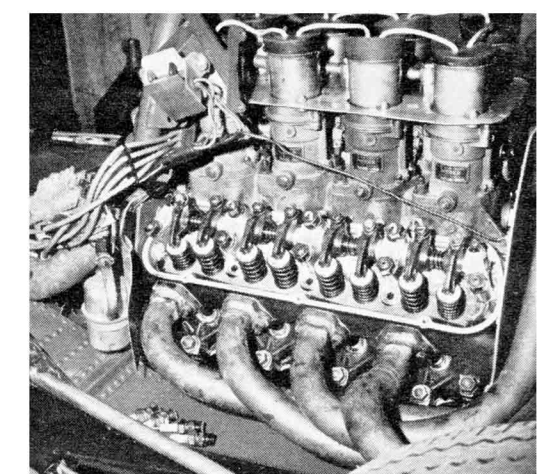
Offenhauser roadster might be hot competition for the Detroit-powered lightweights for a couple of years.

How about the lap speed potential of the Detroit-engined lightweights? Are they anywhere near their ultimate? It is not generally known that Jim Clark turned a practice lap at 152.5 mph on May 18, only a couple of hours before qualifications started. The way it happened:

Colin Chapman, head of the Lotus team, was intrigued by the fact that the American mechanics were mounting their 15-in. tires on 9-in.-wide rims—where he was using 7.5-in. rims with his Dunlop wheels. He wondered how the wide rims would help on the Lotus. He hastily had a couple of Dunlop wheels widened; but he didn't get delivery until a few hours before qualifications. It was when Clark was testing them that he ran 152 mph. When the wheels were switched to Gurney's car, apparently the suspension setup was wrong for them (especially as the tires had been scrubbed in with Clark's camber setting). Gurney got in a hurry and

skidded his car into the wall—putting it out of the race. He also wrecked the only two wide wheels they had. Thus Clark qualified on 7.5-in. rims. Fortunately the Lotus mechanics were able to get the practice car ready in time for Gurney to qualify on May 19. They had Ted Halibrand cast up some magnesium wheels with 9-in. rims to fit the Lotus bolt pattern for the race.

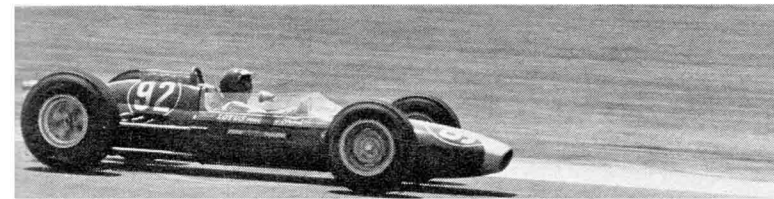
This incident illustrates more of the true lap speed potential of the lightweights. Apparently their true weight/bhp ratio is very satisfactory already. Ford engineers quoted a peak of 376 bhp at 7200 rpm for the final race engines on 105-octane pump gas,



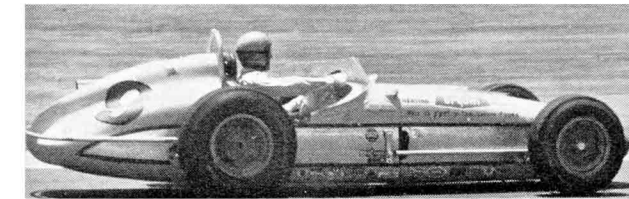
And pushrod Ford for Lotus.



AT FULL SONG: Jones enroute to victory . . .

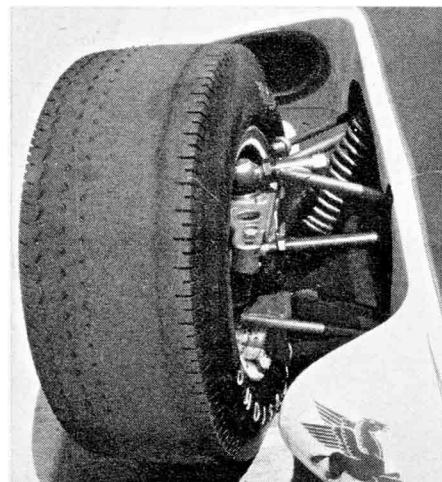


With Clark in hot pursuit . . .

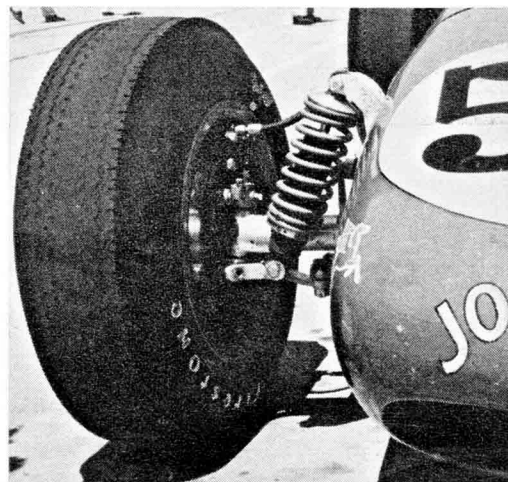


Followed by hapless Eddie Sachs.

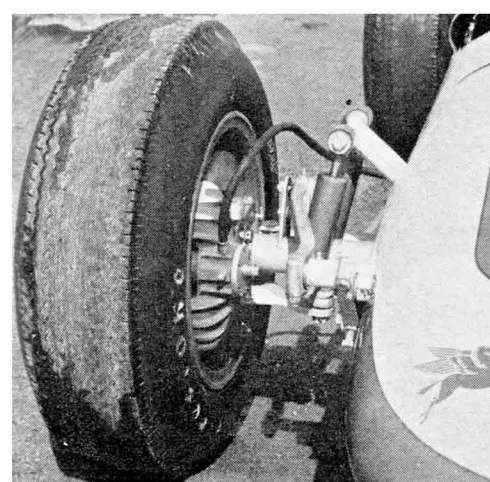
ROLLING ON: 12-in. tires . . .



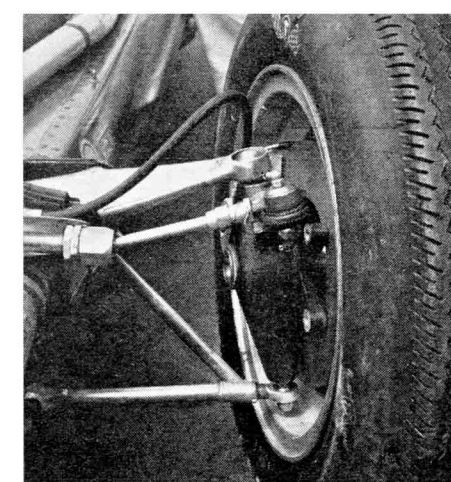
Coils and 15-in. rubber . . .



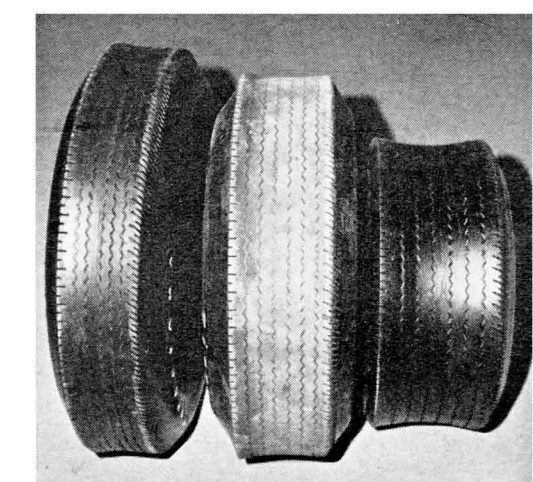
With brakes filed down to fit . . .

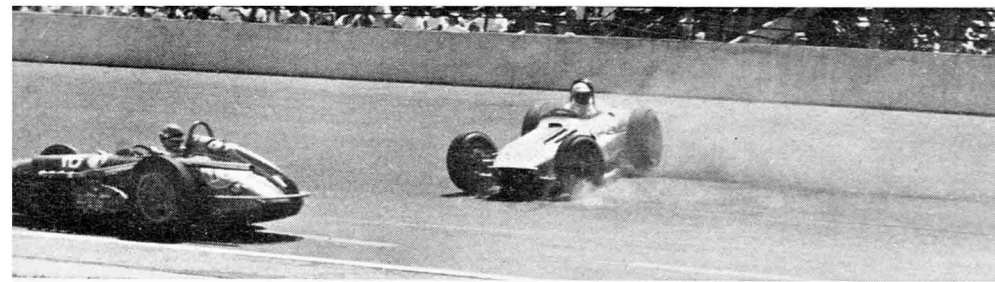


Lotus independent front . . .



And the tires to fit.





MANY SPINS happened during race, such as this one, as Bud Tingelstad starts slide toward southeast turn wall.

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using four 58-mm dual-throat Weber carburetors. This seems fantastic from a 255-cu. in. version of the Fairlane V-8; but we'll have to accept the figures until something else turns up. With the quoted dry weight of 1130 lb. on the Lotus cars, this would give them a better weight/bhp ratio than the Offenhausers. However, the hotter Offenhausers could out-accelerate them coming off the turns.

And, strangely enough, the Lotus-Fords weren't making up a lot of the time in the turns. I was timing the various cars carefully through the quarter-mile trap in the southwest turn during qualifications. Jim Clark averaged 141 mph—compared with 143 mph for Parnelli Jones and 139 mph for Gurney in the practice car. Admittedly there were only three other Offys that could hit 141 mph through that turn. But the point is, we all expected that the lightweight rear-engined jobs would be considerably quicker through the turns than the big Offenhauser front-engined cars and that this would more than make up for any deficiency in acceleration. As it turned out, the lightweights perform just about like the hotter Offenhausers all the way around the track.

Of course, don't forget that the Lotus-Fords were doing this on pump gas. Methanol fuel would add about 10% to the bhp—and a little nitro could easily add another 10%. Allowing for some chassis development . . . well, you can see that they really have the heavy Offenhausers hands down on lap speed potential. When you allow for one or two fewer pit stops, that just about clinches it. The light

weight and independent suspension are apparently the keys to the whole deal. How can you fight it with a 450-lb. engine? For these reasons I can't help but feel the conventional Offenhauser-powered Indianapolis roadster, as we know it, is on the way out.

Mickey Thompson's radical rear-engined cars failed to come up to expectations. They didn't have the horsepower for one thing—even with nitro. Handling in the turns was very skittish, what with the wide tread and tiny tires. Firestone didn't build quite the flexibility into the tires that Mickey wanted (fearing excessive wear), so the driver had little feel of an impending skid. It was virtually impossible to drive the cars consistently near the ragged edge. Cornering speeds were on the low side. When coupled with mediocre acceleration, it was hard to get lap speeds above 148 mph. Al Miller turned the best lap of 150.4 mph in last year's car with 15-in. wheels and, believe me, he threw caution to the winds to do it! His ninth-place finish was well deserved.

But Mickey is still convinced that the small tire with very wide tread is the way to go at Indy. He'll be back next year with another step in the evolution.

Everyone had high hopes for the fabulous supercharged Novi V-8s this year. Andy Granatelli had three in the field, with a top qualifying lap speed of 151.26 mph from Jim Hurtubise. Jim was getting through the southwest turn at 138 mph, which wasn't bad at all. His acceleration on the straights was nothing short of fantastic (up to 190 mph they say). His car jumped

out of gear right at the start; but he still recovered and passed six cars to lead Parnelli Jones by a car length for the first lap! That takes some performance. But this apparently isn't the way to go at Indianapolis either. The engines are too highly stressed for re-

liability. The cars are heavier, don't have as much left-side weight bias with the wide engines—so tire wear is much greater. These are killing handicaps in today's racing.

The Novi story was very discouraging this year. Bobby Unser crashed

trying to avoid another car, Art Malone had clutch trouble and Hurtubise dropped out on the 108th lap with an oil leak. I wouldn't be surprised if we didn't see the Novis back next year. But certainly Indianapolis will have lost something that can never be re-

placed. The sound and sight of these monsters blasting up the straightaways is an experience every auto enthusiast should have once in his life!

But the 500 will never be the same again after this lightweight assault. Next year should be even more exciting. ■



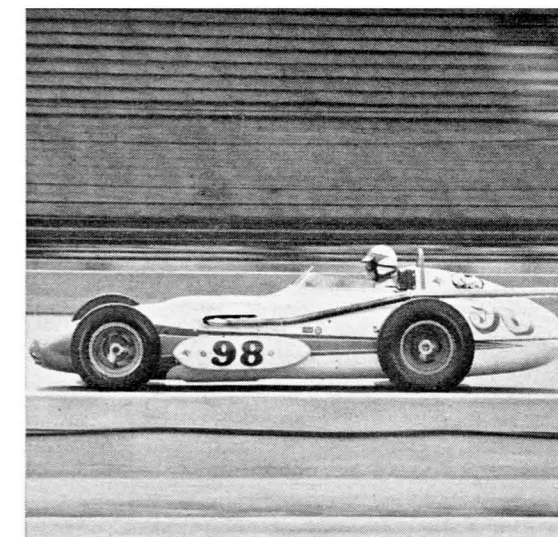
OIL!

SO LONG as there have been sporting events, the judgment and eyesight of umpires have been under question by spectator and contestant alike. The Indianapolis 500-mile race is no exception, and the importance of proper officiating during this climactic race is understandable.

In the 1963 event, Rufus Parnelli Jones led for 400 miles in an exhibition of clean driving skill. But suddenly an oil spigot was turned on. Like a high-speed road oiler, Jones' No. 98 Willard Battery Special began draining itself of lubricant and spraying a film of top oil over the Speedway asphalt. During the final 50 miles, both Eddie Sachs and Roger McCluskey lost control on the slippery surface and spun out of the first five. Jim Clark in the second place Lotus-Ford moved to within 4.5 sec. of Jones, but found the going too slick and eased off.

At the starting line, Chief Steward Harlan Fengler watched the blackening tail and smoking trail of Jones' car and toyed with the black flag, until car-owner J. C. Agajanian rushed up to try to forestall any flag waving.

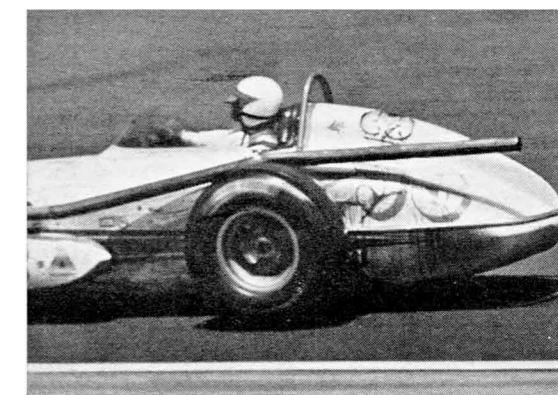
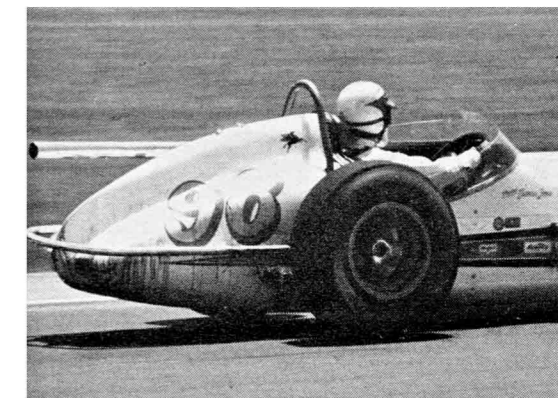
Lotus-builder Colin Chapman also walked up to Fengler to suggest that the Jones car was shedding a great deal of oil and was a menace on the track. Fengler, whose decision it was, exercised his "prerogatives" (as he later put it) to ignore USAC rules and permit the front-running car to continue. Both Clark and Chapman later said they didn't expect Jones' car would last to the finish line. But it did, and the question remains: Should the leading car, with a serious oil leak, be permitted to continue unchecked when it is so close to victory? ■



FOR 170 LAPS Jones' car ran as clean as this study in motion taken during qualifications.

CHIEF STEWARD Harlan Fengler (far left) questions oil leakage with car owner J. C. Agajanian as Lotus designer Colin Chapman discreetly stands by.

DEBATE CENTERED on whether too much oil from leaking car was coating track.



CLARK PUSHES Lotus-Ford past Roger McCluskey to take lead.

