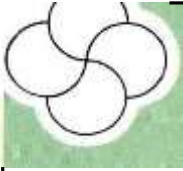


AUTOMOBILE

Quarterly



BRUCE HOOVER



automobile

Quarterly

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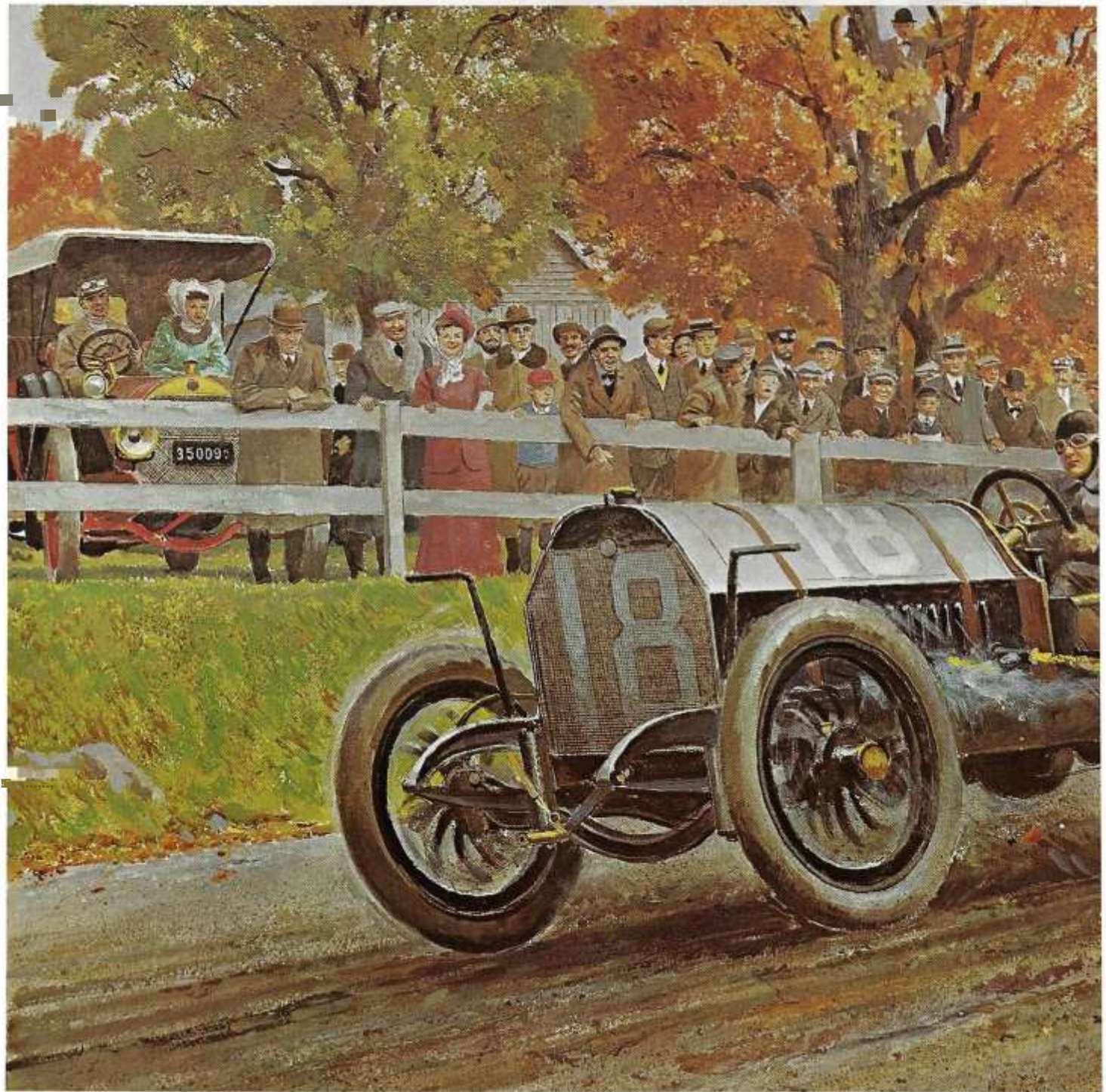
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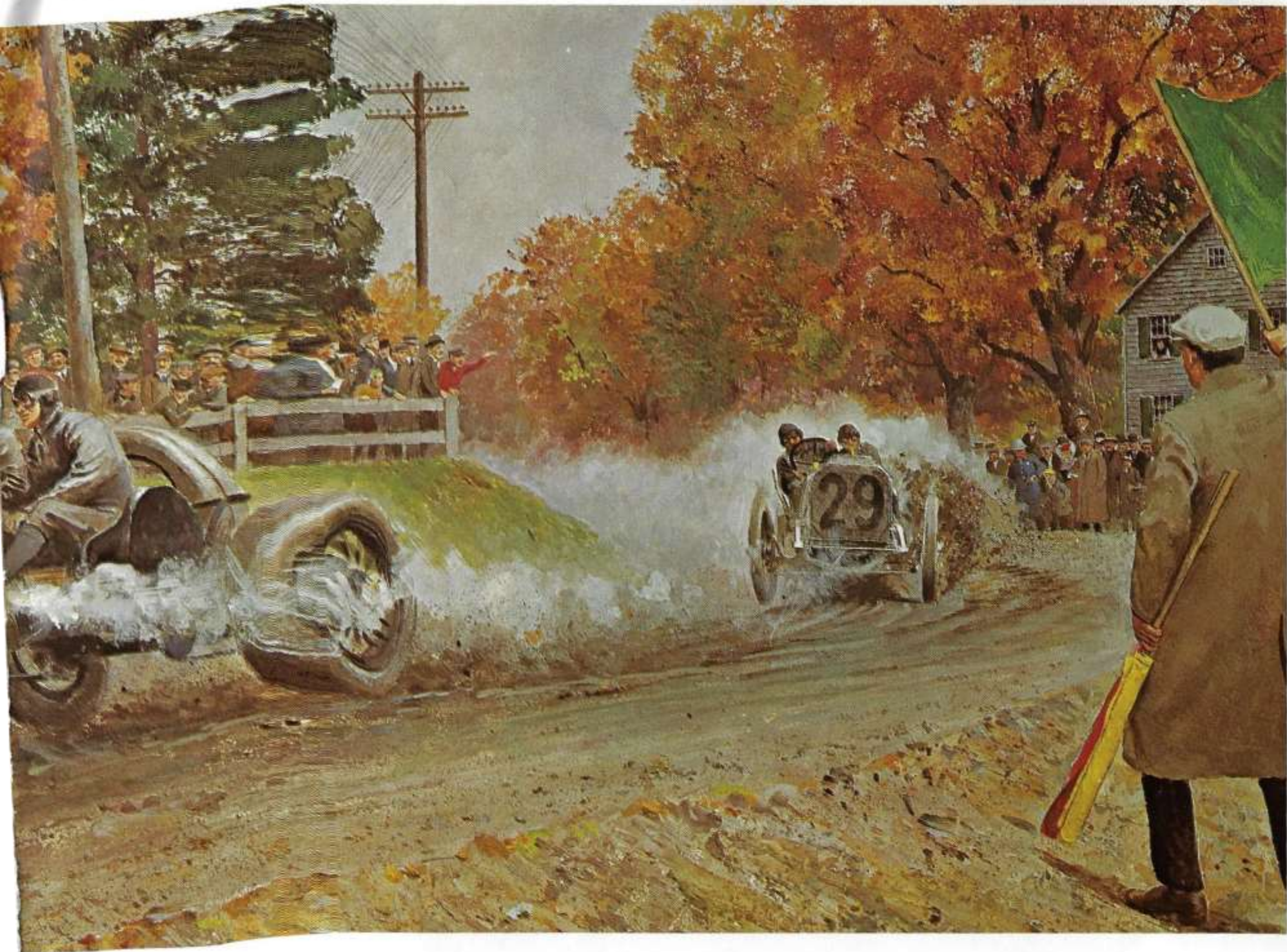
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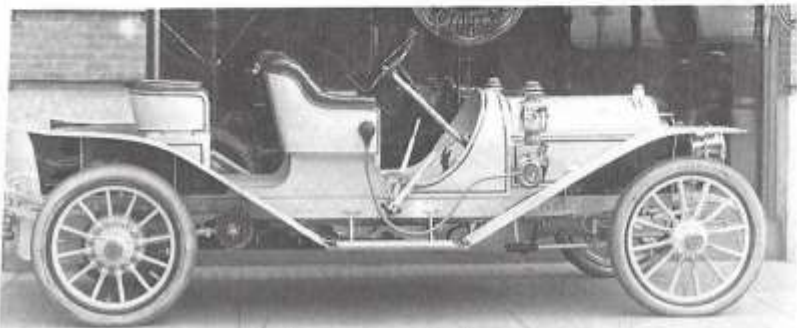
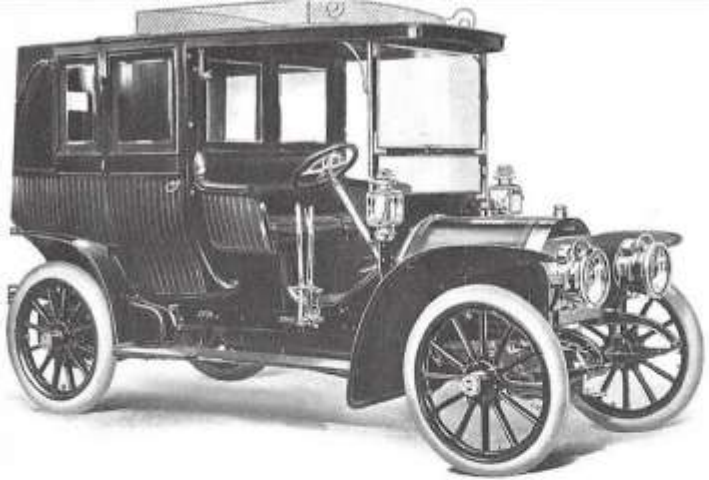
ATCO

A Hi story

by
Beverly
Rae
Kimes







On June 24th in the year 1901 eight locomotive-building plants in the United States merged to form the American Locomotive Company. They were sited in Schenectady and Dunkirk, New York; Allegheny and Scranton, Pennsylvania; Providence, Rhode Island; Richmond, Virginia; Manchester, New Hampshire; and Paterson, New Jersey. A half decade later the firm announced that the 40,000th unit to issue from its plants had been delivered to the Northern Pacific. At the time there were about 50,000 locomotives in service throughout the United States. To gather all the obvious cliches into one neat package, the American Locomotive Company was apparently on the right track with a full head of steam, highballing its way to power and profit.

On June 4th in the year 1905 the American Locomotive Company revealed that it was entering the automobile business "on a large scale." Eight years later it was ignominiously out of it, after having lost, one business reporter estimated, an average of \$460 on every car built. The writer will assiduously avoid the temptation of talking of tiebars and derailments.

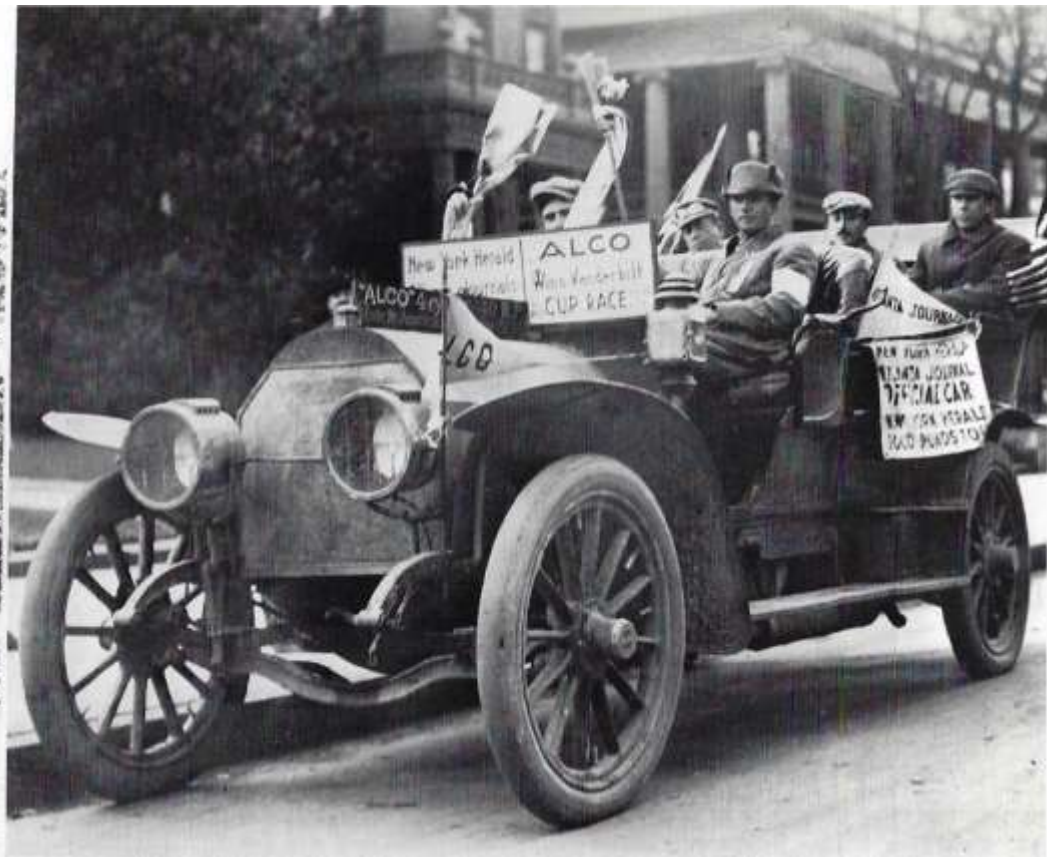
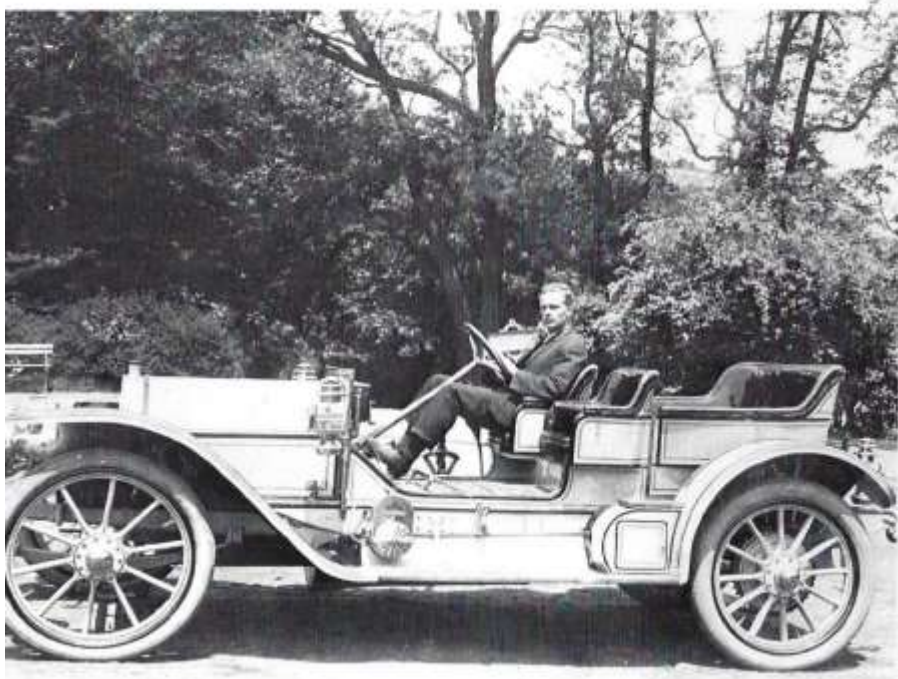
Still one is left wondering - what happened? How could America's largest locomotive-building company have so colossally failed in one field of transportation while concurrently succeeding so brilliantly in another? The reasons are complex, of course, and best await summation after this narrative - first, because some become readily apparent as the story unfolds; second, because others curiously, and significantly, were apparent to virtually no one, not even company stockholders, until it was too late; and third, because commercial failure should not obscure what the car produced by the American Locomotive Company was, that being one of the best automobiles built in

America.

Plans for the company's entrance into the automotive scene had apparently been laid some time during 1904, arrangements having been concluded by the following spring with Automobiles M. Berliet of Lyons, France, for American Locomotive to manufacture the famed Berliet automobile. (The two companies had had previous business dealings in the locomotive field.) On June 4th Albert J. Pitkin, erstwhile chief draftsman of the Schenectady plant and now president of American Locomotive, announced the venture and the imminent construction of a new plant at the Providence branch for the production of automobiles. Trucks and railway passenger cars would follow in the near future, and the Providence factory was eventually to be turned over entirely to this work. By September the new plant was almost finished, Herman F. Ball being named vice-president in charge of operations. Initial deliveries were scheduled to follow by spring of 1906, precisely according to plan. Everything was falling into place quite nicely, and it may be presumed that the first year's production quota - stated at 200 units - was easily met, though actual sales remain a mystery. Presumably a good many of this initial batch were utilized as gifts for railway executives who purchased the company's locomotives, the practice of providing complimentary cars being one freely indulged in by the firm through the years.

Initially the venture carried the name "American Locomotive Automobile Company" ("Automobile" was dropped in 1909), and the preliminary catalogue noted that one Albert T. Otto was manager, with general and sales offices located at 1776 Broadway in New York City. Interestingly, a *New York*

On the facing page: A/cos from the company's Berliet period, the landau/et (above left) as produced in 1907, the runabout (below left) introduced in June that year and a custom version of it (right). Below and right: A/cos, circa 1909, a tourer doing its bit for the "Good Roads" campaign.



Times despatch had hailed the project as "the first instance of an American concern making a foreign car with American material and by American labor, complete in every detail [there were a number of European cars built in part on the se shores] - but American Locomotive quickly quashed at least part of that notion in the aforementioned catalogue, noting that "imported raw materials and parts will be used until careful test has demonstrated that equally good or better can be obtained in the United States." This was, of course, completely consistent with the contemporary view that the finest European cars - as American Locomotive put it - "always have surpassed the product of this country." It is interesting to follow the company's change of mind in this regard, as catalogue succeeded catalogue, such native products as the Lozier and Chadwick - to name two of this writer's favorites - having demonstrated the excellence of which American producers were capable. But more of this later.

In the beginning the approach was definitely transcontinental, a European car built with European components on American machinery and by American labor (both of which the company allowed was the best anywhere). Cost would be no object in the production of the American Locomotive automobile - and neither, apparently, would be price. Indeed the preliminary catalogue of 1906 listing two four-cylinder models - the 24/30 hp on a 112-inch wheelbase and the 40/50 on 118- and 126-inch wheelbases - didn't even bother to mention it. But the secret couldn't be kept long.

In November of 1906 the American Locomotive Company attended its first automobile show, exhibiting at the Grand Central Palace in New York three

four-cylinder chain drive models for the 1907 season: the 24/30 now designated the 22 hp (bore and stroke 3 15/16 x 4 3/4), the 40/50 now the 40 hp (4 3/4 x 5 1/2, and on a 126-inch wheelbase only) and the new 60 hp (5V2 x 5 1/2, on a 126-inch wheelbase as well). The prices for touring cars, fully equipped, were \$5500, \$7500 and \$9000 respectively. Perhaps someone from American Locomotive had a look about him at the show and noticed that virtually all of the cars in the \$9000 and up range - almost all of these European - were grand limousine models, and so for 1908 American Locomotive's 60 hp tourer was reduced in price to \$7500, at the same time being awarded a six-cylinder engine (4 3/4 x 5 1/2) and an impressive 134-inch wheelbase. With the same specifications, the six would be further reduced to \$6000 in 1909, at which it would remain for the rest of its production life. This kept it handsomely in the upper class market, but not quite so noticeably.

A thousand dollars was lopped off the 40 hp for 1908, further lowered to \$5000 in 1909, thereafter to \$4750 in 1910, and \$4500 from 1911. Interestingly the 22 hp model of 1907 - at \$5500, comparatively pricey for a car of such modest power - was increased to \$6000 the following year, this perhaps the result of its conversion to shaft drive. (The bigger cars would get the shaft in 1910.) In the last two years - 1909 and 1910 - before its discontinuation, a 22 could be had for \$4000 and \$4350 respectively.

The careful reader will note the avoidance thus far of applying a generic name to the cars produced by the American Locomotive Company. There's a reason for that - several in fact, and they are simply the variety of names attributed to the vehicle. Officially it was, in the beginning, designated the

American Locomotive Motor Car, which was quite a mouthful. The trade press for reasons of simplification, clarification and perhaps confusion, referred to it as the American Locomotive (Berliet), the American Berliet or just Berliet. The company, however, settled the matter to everyone's satisfaction in September of 1908, with the announcement that the Berliet license was being discontinued, the automobile department would thereafter be on its own with one B. D. Gray as chief engineer for the American Locomotive automobile, now to be known simply as Alco. The words "License Berliet" were immediately struck from the crossbar of the car's hubcaps, and the new name proudly inserted.

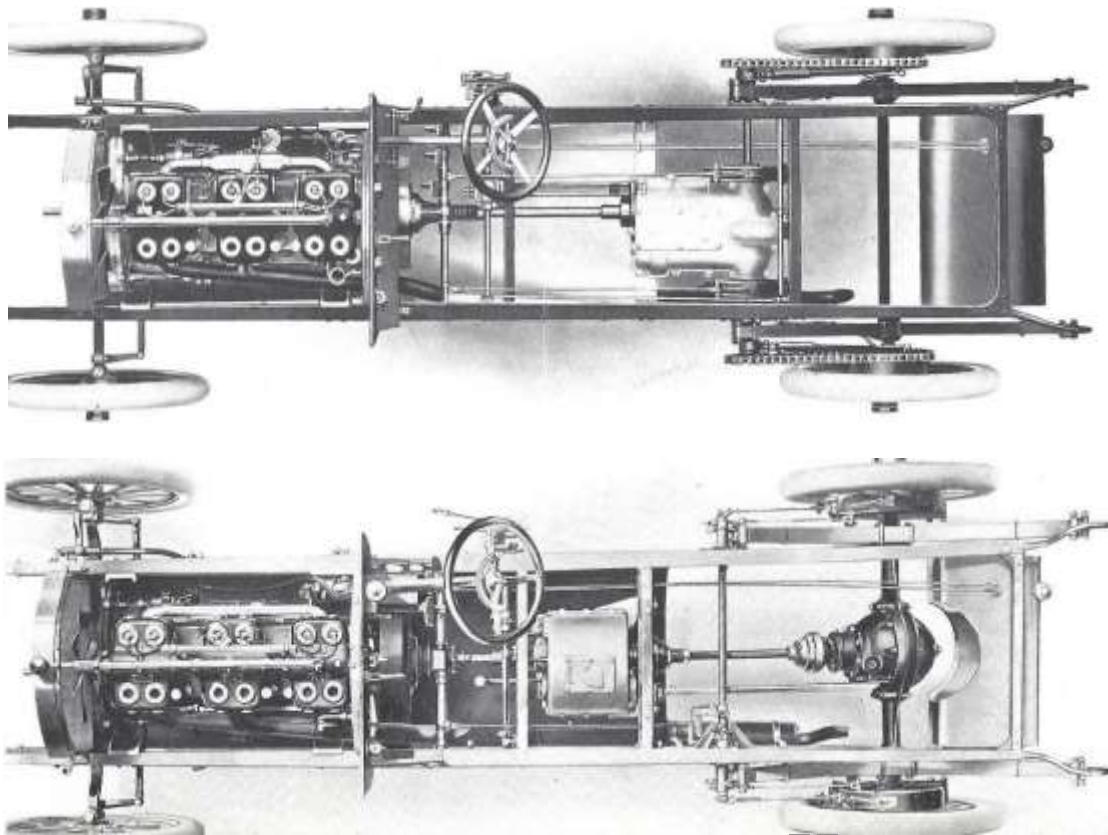
Ah, success! By January of 1909 three of the 40 hp cars had made their way down south where the Florida East Coast Hotel Company promptly put them into well publicized service between Ormond, Daytona and Palm Beach, and in a gesture of unalloyed elitism American Locomotive declined to show their product at either the Grand Central Palace or Madison Square Garden automobile shows in New York that season, electing instead to present their wares at a private exhibition in one of the parlors of the Waldorf Astoria. This took place from January 9th to the 23rd and according to reports "attracted considerable attention." In conjunction with the opening of a new Alco agency in Chicago at 1201 Michigan Avenue, the company did, however, exhibit at the automobile show in that city, the display also including a four-cylinder taxicab chassis and a small working model of an Atlantic-type locomotive.

What all this generated specifically in the way of sales has, alas, been lost to history, although American Locomotive did announce in September that year

their pleasure with matters as they stood, and their plans to convert a number of the Providence locomotive buildings to a utomotive production. This was followed in January, 1910, with the news that the company was now going to spend half a million dollars for expansion and new plant facilities, throwing in another \$150,000 for tools, machinery and good measure.

One often hears references to this or that car driving like a truck, in Alco's case an apt simile is that it was built like a locomotive, and that is meant sincerely as a compliment. Its producers made considerable promotional mileage out of the fact that many of its component parts were made from the "Mystic element vanadium ... the 'anti-fatigue' metal." This led to the catchy Alco slogan "It Stays New" - and was an effective selling point until perhaps Henry Ford began extolling the use of vanadium in the Model T. The alloy had originally been imported by American Locomotive, but by 1910 the company had to admit that factories in the United States were now capable of producing it to Alco standards too.

The engine blocks were cast in pairs from vanadium; the connecting rods, crankshaft and camshaft ("the cams being integral with the shaft, and the whole ground and polished to infinitesimal accuracy") were machined from solid vanadium steel billets. The mechanically operated valves were fashioned out of a special steel developed for locomotive applications to be resistant to the "corrosive action of the hot gasses." By 1910 the lubrication system had evolved into what Alco called "an effective combination of a force-feed and splash ... one highly esteemed by experts." From the two-gallon reservoir in the crankcase oil was drawn via a gear pump, driven by spiral gears from the



exhaust cam shaft, and forced through a tube running along the bottom of the crankcase, from there through outlets arranged so as to feed it directly to the seven main bearings. As Alco explained it: "The crank-shaft is drilled diagonally through the webs from the main-line bearings to the crank-pins and the oil is carried there by centrifugal force. Dams in the crank-case provide for any excess oil there spilling into the tank below, and thus in the crank-case proper the oil is maintained constantly at such a level that, as the crank-shaft turns, the caps of the connecting-rods dip into it and create the splash phase; this splash, besides contributing a further oiling to the crank-pins, effectively lubricates the cylinders, wrist-pins, cam-shaft bearings and the mechanism that operates the valves." Alco had all the bases covered.

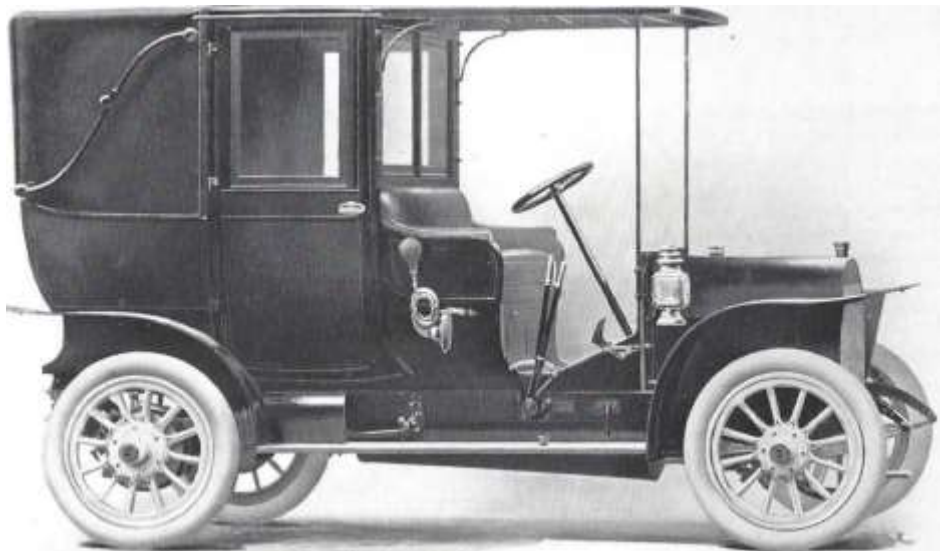
The carburetor was float feed of simple automatic action, revised in 1911 to the Newcomb type; ignition was by Bosch magneto, high tension for the six, low tension for the four in addition, "in accordance with the best European practice." The clutch was a multiple disc variety running in oil with "one of those little niceties which count for much," an automatic brake on the clutch drum actuated by disengagement of the clutch (through 1909) to slow the transmission to engine speed and "save the gears."

German-built Hess-Brigit ball bearings were used throughout the clutch, transmission, rear axle and in the wheel hubs, plain bearings being utilized in the engine "as dictated by experience." Cooling was via a large-capacity centrifugal pump, with a solid flywheel employed (from 1909) and a belt-driven fan set directly behind the honeycomb radiator. The radiator was huge, incidentally, twenty-eight inches by twenty-eight inches with a four-inch core,

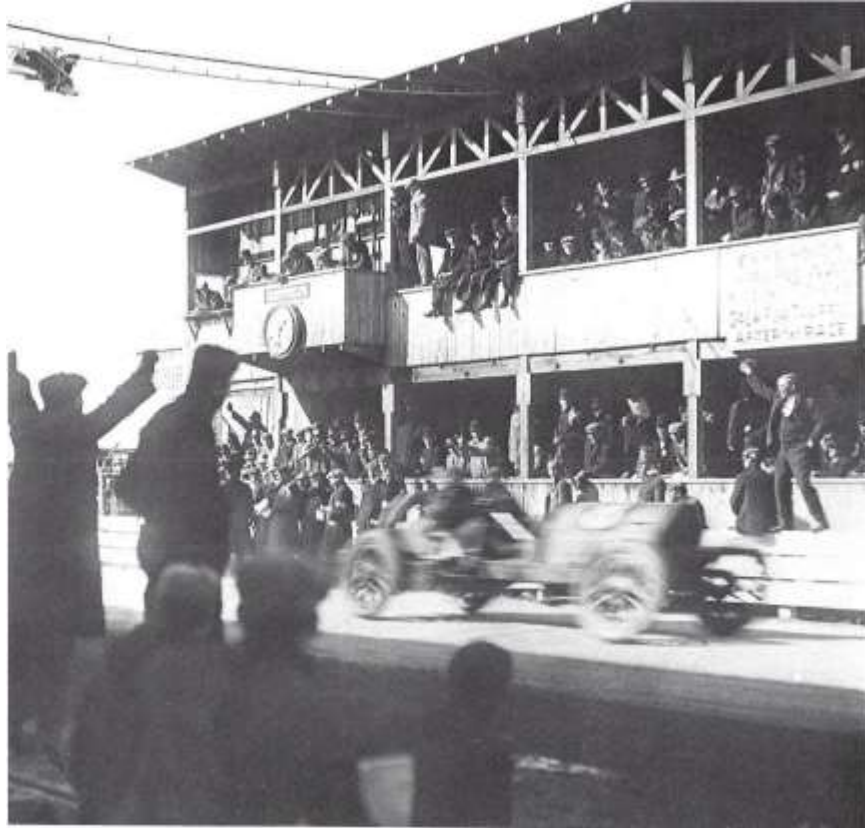
assuring that an Alco would remain cool under virtually any conditions.

Alco said it was "impossible to over-emphasize the importance" of brakes, and theirs were formidable for that day; though technically not out of the ordinary, the braking surface is worthy of note: the inside diameter of the drums being fifteen and a half inches, width nearly three inches. The pressed steel channel section frame was prodigiously strong as well, the semi-elliptic springs formed also from vanadium steel. Neither the company, nor history, has ever recorded any of these components on an Alco breaking.

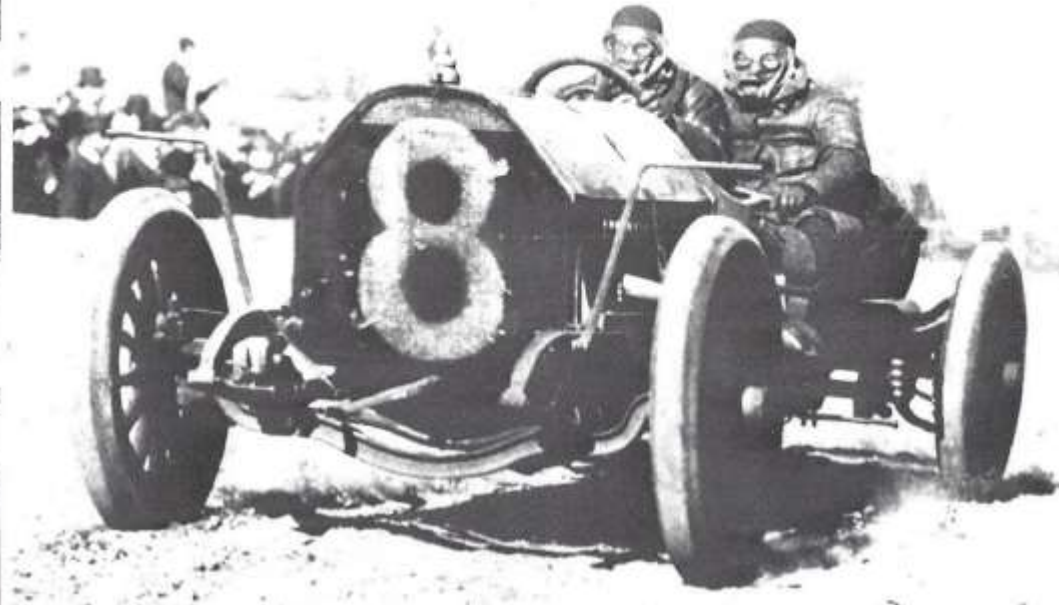
The chain drive models; an imported 35 mm Renold chains of the roller type, the sliding gear transmission - again of a vanadium alloy - providing four forward speeds, with direct drive on both third and fourth. This was accomplished by means of a two-speed differential, and resulted in an exceptionally silent transmission at any speed from a slow walk to maximum. This feature, which Alco claimed as an exclusive, was dropped with the introduction of the 1910 models. But it was the rear axle as developed by the company for its smaller shaft drive car about which Alco would wax most eloquent. It was of the full-floating type, with the stationary and supporting member a one-piece forging extending from the outer end of one hub to the outer end of the other. And the company was so pleased with it that by 1910 it was decided to incorporate it, along with shaft drive, in the larger models as well. But how could these already huge forgings be made in the still larger and heavier sizes? Alco had the answer: for some \$51,700, the largest drop-hammer in the world, weighing some 250,000 pounds. Added to this was correlative equipment for milling, boring and finishing estimated to have set Alco back at



On the facing page: chassis drawings of the Alco six, the chain drive model of 1909 (above left), the shaft drive of 1910 (below left) as illustrated in the company catalogue. Touring in the countryside (right), circa 1910. This page: the Alco taxicab of 1911 (above), from a company brochure. The ladies take to the road (right) in the Alco tourer, circa 1910.



Below: Properly outfitted for their morning's work, Harry Grant, with mechanic Frank Lee, pour it on in the 1909 Vanderbilt. Left: Four hours, twenty-five minutes and forty-two seconds after it had begun for them, the pair crossed the finish line, the big Alco having averaged 62.81 mph for the 278.08 miles of the Long Island course and captured its first Vanderbilt Cup. On the far right: Grant and Lee relax before the fifth running of the Worcester Automobile Club's Dead Horse Hill Climb in 1910. The Alco placed first in class.



least another \$100,000. But, to Alco engineers it was worth it - their rear axle was, they said, "absolutely unbreakable."

Sparing expense was virtually unheard of at Alco. So was depriving a potential customer of any new refinement once it was proven, the company emphasizing in its catalogues that such improvements were immediately incorporated without waiting for the yearly change of model. A commendable practice, yes, but not really practical. Even less practical was Alco's insistence regarding systems of measurement, the company listing both metric and English equivalents in their catalogues and even in later years producing some components on the metric scale and others on the inch.

This then was the Alco, "combining power, strength, weight and simple construction ... to give it perfect balance and fitness for conquest of all roads." And it became available in a perpetually increasing and occasionally bewildering array of body styles: tourers, toy tonneaus, limousines, roadsters for two or, with a "dinky" seat, for four - plus the custom models for anyone desiring them, including a rakish sportster that William K. Vanderbilt created for himself.

No one at American Locomotive doubted that theirs was an excellent motorcar - nor did anyone else for that matter. But there was one gentleman in the company's employ who thought it was even better than everyone else did. But for him one of the most exciting chapters of Alco's history would not have been written.

Harry Fortune Grant smiled a lot, and as a Vanderbilt Cup program curator usually mentioned, "there is a lilt of cheeriness in his voice as he talks, so it is not

surprising that he weighs 200 pounds." He measured not quite six feet. Harry was a big man. In 1906 he was chief test driver for American Locomotive, and like many another in his position he developed a longing to race the cars he tested. Approaching company officials with the idea, he was given a polite but firm no. American Locomotive Company did not build racing cars. Harry was adamant, he knew he would have no peace of mind until he could race, and in the interim he was, as he said, keeping "the peace of others somewhat disturbed." And so he pleaded, again and again, with the same results. Finally in May of 1907 he left Providence to work for the Alco dealer in Boston, one

C. F. Whitney, an accommodating man who was persuaded to Harry's way of thinking in less than a month. Whitney bought a 40 hp car from the factory, and with it and Frank Lee, a tester at American Locomotive, Harry Grant drove to Readville, Massachusetts. There, in the track races on September 14th, he handily won the five- and twenty-mile events and finished second, after a tire burst, in the fifty-mile race. After that Grant and Lee - how curiously are those names paired in this context - battled the opposition all over Massachusetts, gathering more laurels at Readville and such other venues as the Worcester Dead Horse Hill Climb, and only just missing a win in the Lowell road races, placing second in 1908 after eight tire changes in a demonstrator that had already totted up 20,000 miles, and leading in 1909 until three laps from the finish when a rear tire burst and tore off the chain.

By now even American Locomotive was impressed, and Harry Grant was soon officially racing for the factory team. Actually Harry was the team, with faithful Frank Lee as his riding mechanic, and impending entrance in some of



the major events of the American racing calendar. First of these was the Fairmount Park 200-mile on October 9th, 1909, but Harry, having discovered, as *The Horseless Age* put it, a slight and easily repairable imperfection in the steering gear "was inclined to err on the side of prudence and decided not to start." Harry was probably also thinking about the Vanderbilt Cup on Long Island three weeks hence. After the previous year's running of that event, he had told American Locomotive officials that the big six-cylinder Alco was the only American stock car that could win it - and insisted that he could do it. ("They tell me [I] was very much in earnest," he reminisced, "and almost cried.")

The 1909 Vanderbilt has, alas, come down to us in history rather as a "maligned lemon" to a "delicious grapefruit." Those were the words of the "Captious Critic" from *The Motor World*, echoed by most reporters and many spectators in view of the race's having been altered from its international status of years previous to a national event for stock chassis of 301 to 600 cubic inch displacement, with supplementary races for less-powered cars to be run concurrently. Thus missing were the fire-breathing out-and-out hellions of years past ("everyone anxiously waited for something resembling a genuine racing exhaust"); and the foreign entrants among the fifteen starters included only three Fiats, a Jonesotta and Mercedes. In their place was a great deal of confusion, as we shall see.

Although the grandstands held the estimable likes of John D. Rockefeller, Sir Thomas Lipton and Jack Johnson; and William K. Vanderbilt was there as always in sartorial splendor, much of the social swirl surrounding previous

contests was missing too. This was principally because the race had been removed from its usual daybreak start to nine in the morning, thus making unnecessary the stay-up-all-night carousing that had provided so much of the frivolous fun in years past. As the Captious Critic pointed out: "To crawl out of one's own home at 6 o'clock and motor down to the course in the broad daylight, on a cold morning, was too much like going to work." And so the massive crowds didn't show up - and when it was all over "quite a number of uncalled-for 50-cent sandwiches and seats on private grandstands were wrapped up and carefully stowed away in the safe of the general store at Hicksville ... for use in the 1910 Vanderbilt."

All this is mentioned only to underscore the fact that circumstances notwithstanding, his making have, unhappily, minimized what Harry Grant accomplished in the 1909 Vanderbilt. In fact he was almost undone by them. On the surface it appeared that the event had been effectively organized, with no problems foreseen. The Pinkertons, carrying "cylubs in addition to pipes and pints ... had little or nothing to do in keeping the crowdless course clear, but they did it well." The twenty-five doctors deployed around the circuit thankfully also had "nothing to do but look wise or look pretty, as suited the individual." But the timers did have a task to perform - and didn't: "They retired in the tenth lap and did not wake up until 'Father' Joyce, of the Alco institution [he was the team's pit chief] called their attention to the fact that his six-cylinder machine was passing every now and then without being recorded."

Unfortunately all this happened in the closing stages of the race, and after the protest was accepted and the "big black Alco" duly credited at the timers'

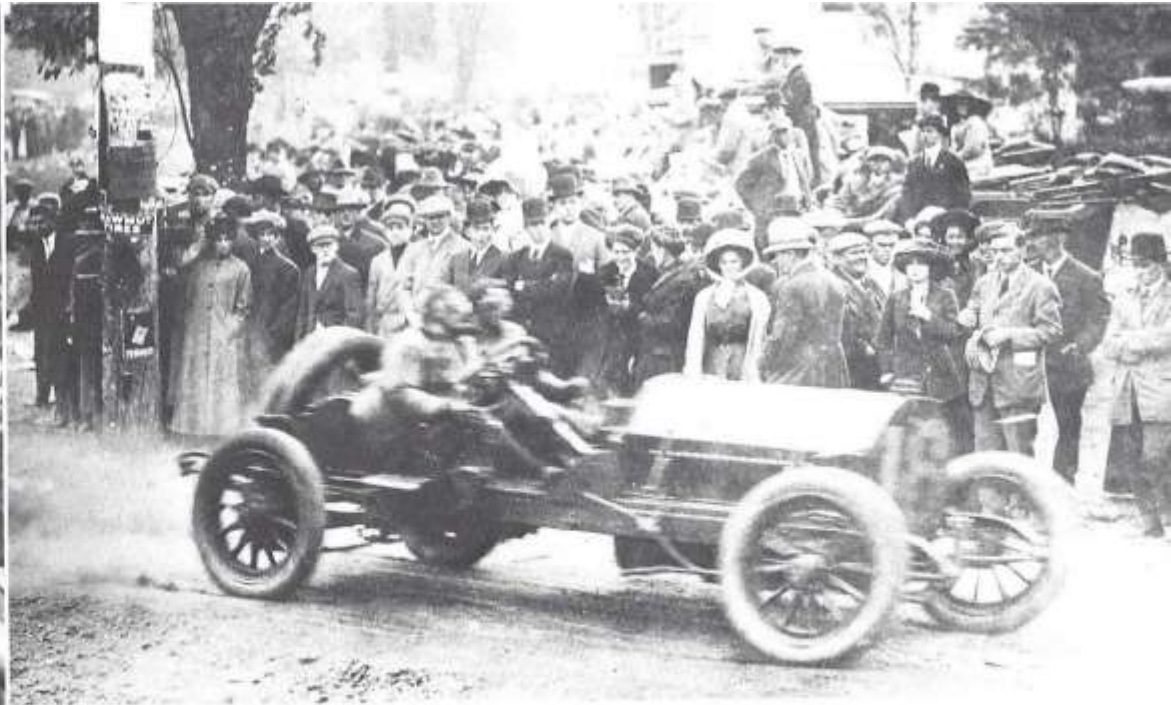
stand with the appropriate number of laps, Grant was given a "next to last lap" signal that confused virtually everyone who was following the scoreboard, most particularly the photographers who had their cameras poised in anticipation of recording the finish of the winner. Just who *was* the winner? Make no mistake about it. It was Harry Grant. And he had run a beautiful race.

Prior to the event Harry had estimated that the average speed necessary to win the Vanderbilt was between sixty-two and sixty-three miles an hour. His winning average was 62.81 mph, and he was five minutes ahead of Ed Parker's second-place Fiat. In the early laps he had allowed the cars ahead of him to dice among themselves, and with 100 miles of the 278 total still left to be run, fully two-thirds of the field were scattered about the circuit with broken radiators, crankshafts, camshafts, steering knuckles, cracked cylinders and the like. Billy Knipper was then in the lead with his Chalmers Detroit, behind him Parker and then Harry Grant, ten and nine minutes back respectively. Harry played it cool, so much so in fact that during pit stops "some of the spectators got the impression that he was about to retire, so entirely devoid of any suggestion of rush were his movements." But Harry knew what he was about. Knipper's flashing pace resulted in an overheated engine, and soon he was reduced to a crawl. Now it was between Parker and Grant - and in the closing laps Harry cut loose. Only the scoring mixup prevented the crowds from appreciating the battle that followed, Harry lapping the circuit at more than 70 mph and providing an altogether splendid victory for the American Locomotive Company, who responded with another slogan "What lasts best, is best."

Nineteen ten was still better. The organizers having learned a bitter lesson in 1909 made sure it wouldn't be repeated in the following year's Vanderbilt. Though the event would still be stock chassis in character the rules were relaxed sufficiently - dealing principally with an engine limitation of 600 cubic inches - to provide more variety in entries; and the starting time was moved back again to the more rakish crack of dawn. Consequently on October 1st the sun arose on a field of thirty cars - a record number of entries, nine being the previous highs in 1905 and 1908 - all ready to perform before a huge crowd of 300,000 bleary-eyed but merry spectators. Although the field would not be as international as the earlier Vanderbilts, the liberalized rules did produce trials each of semi-racers from Marquette-Buick and Benz, Spencer Wishart's lone Mercedes and enough engine noise to shake the ground for miles around. It would be quite a race.

Harry Grant was back with the same Alco in which he'd contested the previous year's event, the car now dubbed "Bete Noire," ("Black Beast") because, as *The Horseless Age* put it, Grant "again has hopes of proving the dark horse in the race." Harry ("Milk is my toddy") Grant, who believed self-restraint was a racer's most important asset, who often declared unabashedly that he didn't take chances ("if I ever thought that I was risking my life you can bet I would not start") did not provide the stuff of which racing legends are made - or favorites picked. But Harry hung in there.

Blasting away ahead of him at the start, among others, was Louis Chevrolet in one of the "hyphenated Buicks," his brother Arthur and "Wild Bob" Burman on the two other team cars; Joe Dawson (Marron), Ralph Mulford (Lozie)



Left: Harry Grant, bearing his usual inscrutable expression and the confident air of a man who knows he can win. Above right: He proves it again, taking a corner during and then crossing the checkered flag at the conclusion of the 1910 Vanderbilt Cup, his big Alco winning this event at an average speed of 65.18 mph, the fastest Vanderbilt of the series thus far.

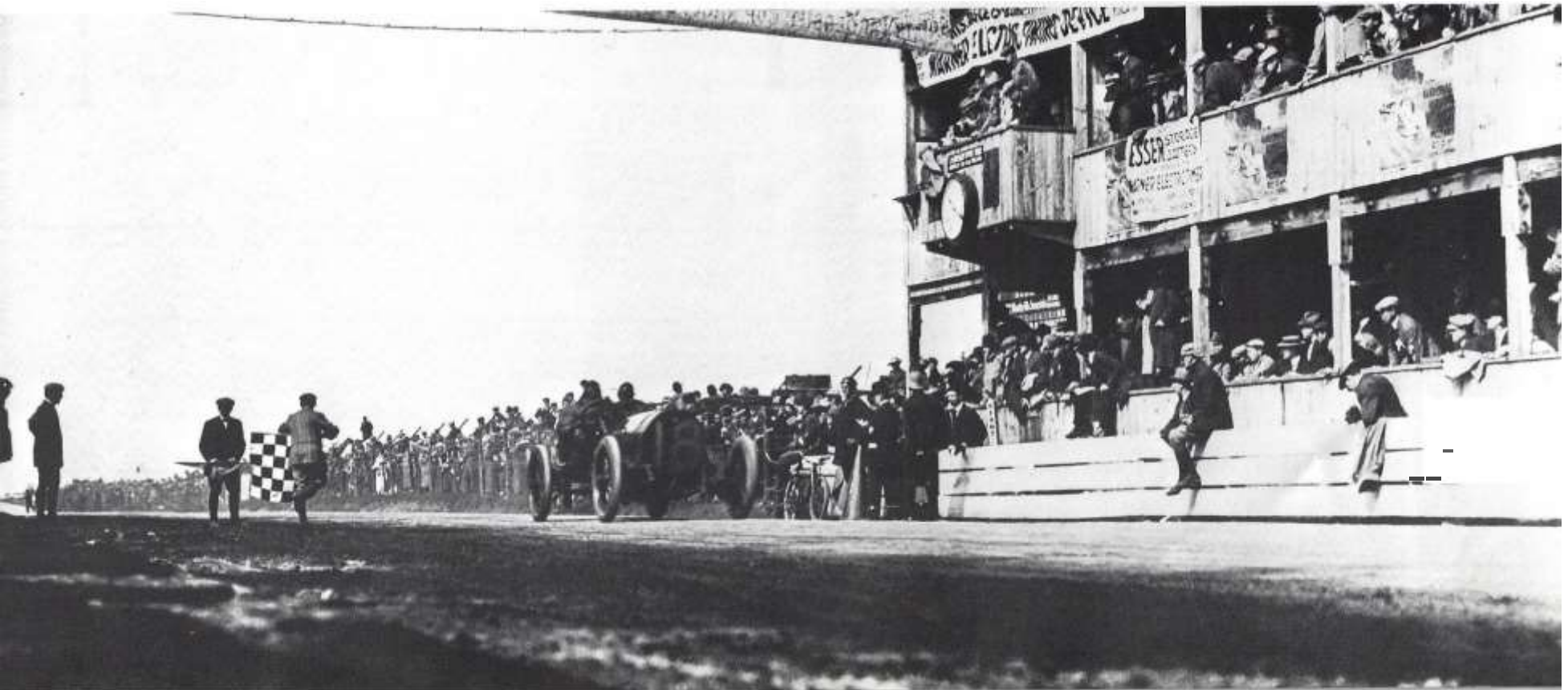
and Bert Dingley (Pope -Hartford) fought among themselves - and Harry ("driving magnificently, if less impressively") settled himself into a comfortable seventh place. Those drivers who practiced the art of reckless abandon in those days were called skyrockets; the likes of Louis Chevrolet and Bob Burman were "a sight to make eyes bulge." "Their going was positively wicked" - and their pace killing. On the fifteenth lap (of twenty-two), Louis Chevrolet crashed (his mechanic was killed, one of three casualties that day). Chevrolet's two teammates, among nine others, had previously retired in various states of disrepair; eight others were to follow. Joe Dawson was now in the lead, but suddenly everyone realized that the man with a "cheerful face and clear head" was "going some" too. Harry Grant was picking up the tempo. In those closing laps the duel between the Marmon and the Alco was quite the most exciting - and unexpected - turn of the race. On the next to the last lap it looked as if it might all be over, the left front tire of the Alco blew, and Harry pitted. As he calmly sat in the car, his crew changed the tire in twenty-two seconds, easily three times faster than any other similar operation by any other pit crew that day. Afterwards Grant recalled that as he took off again after the lightning change, "Mr. Michelin came trotting up, exclaiming: 'Ah! Non! Too fast! Too quick!' " He needn't have worried. The tire was secure - and Harry won the race, by twenty-five seconds in a spectacular finish. His average speed was 65.18 mph, the fastest Vanderbilt ever. And the legions who had earlier been critical of the American Locomotive Company "for not securing a more sensational pilot for its cars" decided they'd been wrong all along.

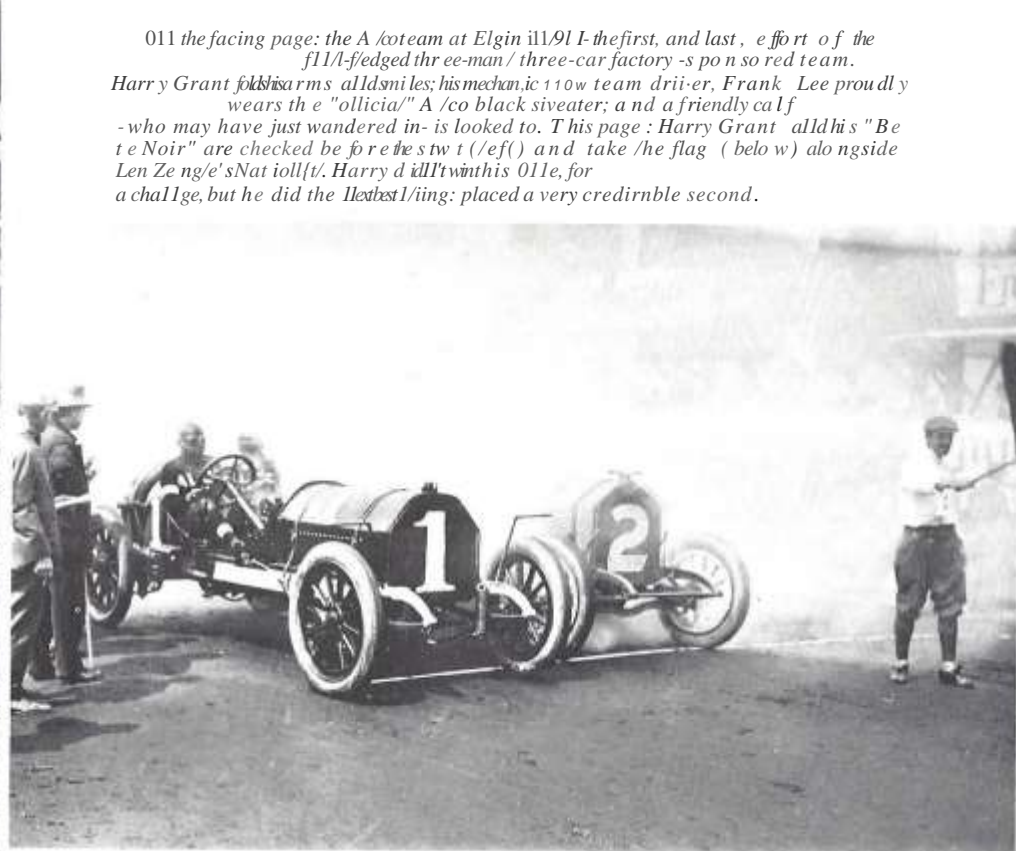
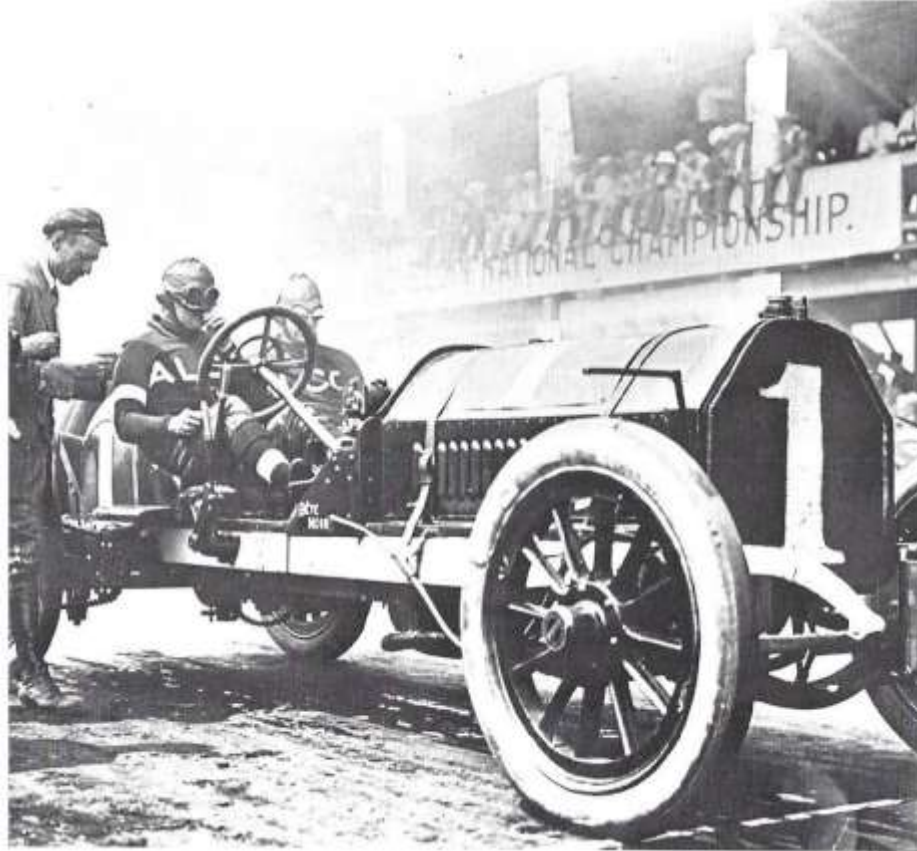
The same man driving the same car winning a premier American road event

two years in succession - never had this been done before, and one might certainly have excused the men of American Locomotive for taking enthusiastic promotional advantage of the fact. But they didn't, preferring to play it almost as cool as Harry. There was the usual "story of the race" booklet published by the company wherein Harry confessed the guilt feelings he harbored because of his unfair advantage over other racing drivers ("a car that [is] absolutely dependable for consistent running" and, most important, as safe as a cathedral); there were references in brochures and the occasional advertisement, but nothing much beyond that.

All mentions of the feat, of course, alluded to the Alco's being a "touring model taken from stock." Press reports mentioned only the addition of "a fine wire connecting from the carburetor throttle to the [driver's] seat" to be used if the accelerator linkage failed. But, as the reader has learned in the article preceding, there were other deviations from the production norm, although research indicates such "refinements" were more the rule than the exception in racing during this period. The Alco was indeed "a touring model taken from stock" - the company neglected only to mention what was done to it after it was taken.

Harry Grant had taken the Alco racing elsewhere in 1910, winning his class at Dead Horse; starting in three races at Indianapolis, winning two of them and placing fourth in the Cobc Trophy after a heartbreaking seven tire changes. But at the Elgin road races and the Savannah Grand Prize he didn't finish, nor at the inaugural 1500 at Indianapolis in 1911. Interestingly, it was not until the 1911 Elgin races that American Locomotive decided to go all out with a full-





011 the facing page: the Alco team at Elgin in 1911 - the first, and last, effort of the fledgling three-man / three-car factory-sponsored team. Harry Grant folds his arms and smiles; his mechanic, now team driver, Frank Lee proudly wears the "ollicia" Alco black sweater; and a friendly calf - who may have just wandered in - is looked to. This page: Harry Grant and his "Be the Noir" are checked before the start and take the flag (below) alongside Len Zengle's National. Harry did it with this 011, for a challenge, but he did the best thing: placed a very creditable second.

fledged racing team of three cars, Harry to be joined by Frank Lee and Harry Hartman in shaft-drive Alco sixes. In the event Harry "kicked up very little dust ... skidded less" and finished second to Len Zengle's National (perhaps his pre-race strategy had failed Harry this time). Lee finished fourth, Hartman had retired midway through the race. This was, of course, a completely respectable finish for the Alco team, but less than three weeks later the company announced, to general surprise, its withdrawal from competition ("racing takes more time and attention on the part of our organization than we feel justified in devoting to it") and the gift of the two-time Vanderbilt winning car to Harry Grant "as an expression of our appreciation of his services to us." Alco would race no more.

Harry S. Houpt, who had taken a fling in automobile manufacture himself in 1909-1910, had been manager of the Alco team for the 1911 Elgin event - and certainly the company's racing activities ceased thereafter because the irrepressible Mr. Houpt found himself preoccupied with other matters. That year, too, he had been appointed as the company's general sales manager, a formidable undertaking. Alco hoped to lower the unit cost of manufacturing its automobiles without compromising or altering whatsoever the mode in which or materials with which manufacture was accomplished. The obvious alternative was increased sales. Houpt apparently did his job well: It is on record that during his tenure the number of Alco agencies was raised from four to eighty-nine, "365%" more Alcos were sold, a branch established in Boston (567 Boylston Street) and Canadian headquarters opened in Montreal.

American Locomotive's automotive efforts were by now diversified into the

company areas of truck and taxicab manufacture - and in both of these the company approach was the same as it had been for passenger cars. The first catalogue mention of the Alco truck was made in 1910, the company noting that the initial model had been put in service three years earlier by several big businesses in New York City, with an Alco representative assigned "to do nothing else than follow these trucks about and keep a complete record of their mileage, of the tonnage hauled, of every adjustment, every replacement of a part, every replenishment of fuel and lubricant." Only after this in-service experimenting was the three-ton Alco truck put on the market. It was priced at \$3500.

Likewise had Alco's taxicab been put to the test, the company aware that such vehicles "operated by many different drivers, mostly in careless fashion ... are notoriously a buse d." Alco's taxi carried the 22 hp four-cylinder engine, but governed down to 800 rpm for an effective sixteen horsepower and a maximum speed of twenty miles an hour. With regard to most other specifications, the company acknowledged that "in general there is more similarity than difference" between it and the small Alco town car (as the 22 hp model was designated). Indeed, for \$3750 (four hundred dollars more than the livery version) a prospective customer could have the Alco taxicab "finished for private use." Doubtlessly something like today's Checker.

As for the passenger car, the company proudly allowed in its 1912 catalogue that "The Alco is the same old car." Technically there had been more refinements than changes, the most significant of the latter being a boring out of the larger four in 1911 to 5 1/2 inches (by 5/2) for 453.6 cubic inches, and



rated horsepower of 42. Developed horsepower figures weren't given for this model, though the 579.5-cubic-inch six (rated at 53.4) was claimed to develop 78 bhp. It most certainly did that.

"Unable to build a better car, the American Locomotive Company in its 1912 Alcoa, has built a more beautiful car," purred the catalogue - and here indeed was a major change in the Alcoa approach to its product. Previous catalogues had barely mentioned the fact that there was more to the Alcoa than chassis, drivetrain and engine. Now what the car looked like came to the forefront: "smart, daring, and yet conservative, on the very frontier of progressive motor car building"; less ambiguously it might be said simply that the Alcoa was given some style, or "charm," as its makers put it. Immediately identifiable was the one-and-a-half-inch white stripe circling the body, drawing the eye to the now longer, lower, straighter lines of the coachwork and adding "a touch of life to the color," which incidentally was applied in eighteen coats of paint from sandpapering to final varnish. However one regards the

Alcoa stripe, it cannot be denied that it was distinctive, which was precisely its purpose. And without the least bit of chagrin, the men of Alcoa virtually conceded that their previous design - and everyone else's, of course - had become "old," "commonplace" and "stereotyped," that heretofore "automobiles have not been designed by men with a sense of beauty. One might just as well permit the plumber to design the house."

Still it was "The Little Things" - both elegant and practical - about which the company expressed particular pleasure: the automatic electric light illuminating the step with the opening of the tonneau door, the cluster of three

lights in the dome, the speaking tube, an electric button to signal the driver, the electric cigarette lighter - "and all wiring's invisible." On the cowl were fresh air vents fashioned of brass with the name ALCO debossed stylishly thereon. The door handles on the tourer were placed on the inside to further enhance the cleanliness of body line, marine windows in the rear of all closed models lent a new look to the back of an Alcoa and a better view of the road behind to its driver. The Berlina was given Pullman windows in the roof, and a "window regulator" for those on the side: "a simple mechanism, concealed from view with only the handle showing. Turning the handle in one direction, lowers the window. Turning in the opposite direction, raises it. Just another indication of the extent to which the Alcoa builders have gone to minimize irritating troubles." Its makers were sure this was an improvement over the usual window straps.

The theme of refined luxury was carried into the 1913 models, with a number of changes. Now the limousine was called a Colonial with a "barrel back" and a six-pane rear window treatment that provided for what Alcoa called "a sensation in curves." The windshield was a model of understated elegance, finished in ebony and mounted on an oak frame; a "disappearing window" was provided between front seat and back, dropping down when desired with a mere turn of the handle; the tool box was concealed from view underneath the running board.

This was a most interesting turnaround for Alcoa. Although the company still boasted of its painstaking approach to all matters technical ("It takes one year and seven months to build one Alcoa - six months alone to build the rear axle-

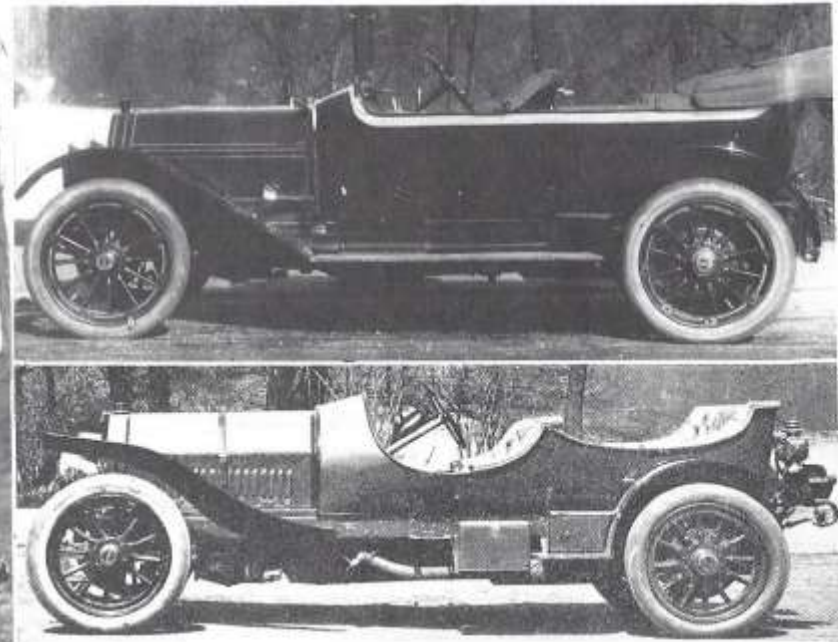
le"), the fact that the car was, as Alco claimed, the highest-priced in America, was as much for reasons of its sophisticated style and genteel refinements as for its high quality chassis. The appeal was blatant. The Alco had become a snob.

Nothing more aptly illustrates this point than the 1913 catalogue, with six pages devoted to the car's engineering internals, eight to its styling externals - and a full fourteen to a flighty little piece of fiction relating how an Alco touring car saved an upper class marriage. Written by Ethel Lloyd Patterson with fanciful illustrations by A. Popini, the story unfolds through a series of letters written by Edith Townsend Van Peyster of Fifth Avenue, New York, to her beloved aunt, Cornelia Townsend, who had been kind enough to lend her Alco and her chauffeur to the distraught niece. Edith, the chauffeur (Williams), her estranged (Fred), and the Alco traipsed through New England thereafter, Edith writing "Tante" at every stylish step of this journey whose purpose it was to work out amicably the ending of her marriage, or as she said "le dernier cri in divorce" - French phrases tripped from her pen in torrents and Edith's biggest worry appears to have been that she might "so und middleclass." The Alco was oft mentioned, of course ("I wanted to hug it somewhere. I ran my hand gratefully along the deep, padded cushions. It trembled as though it understood.") - and all ended happily, Edith's last missive to her aunt declaring that she had absconded with the Alco and Williams and Fred for a second honeymoon abroad. Quite the most extraordinary piece of automotive promotional literature this writer has happened upon, the 1913 Alco catalogue is a case study of early Twentieth Century American Chic - and as far as a cry as possible from anti-fatigue metal, "It Stays New" and Harry Fortune Grant.

But flights of Fifth Avenue fancy aside, there can be no doubt that the new and stylish Alco passenger car, as all contemporary press reports indicate, was greeted with anything less than critical acclaim, and much of this was very enthusiastic. As for the company's other automotive products, early in 1913 American Locomotive received an order for eighty of its trucks to be put in mail service in New York City - reportedly the largest single order of its kind. Fleets of Alco taxicabs were already coursing the streets of New York, Boston, Philadelphia, Baltimore, Chicago, Minneapolis and San Francisco - and the company was reported to be building more taxis than any other firm in the country.

The news made the front page of *The New York Times*. In the August 22nd, 1913 edition - between revelations that President Wilson was contemplating a show of force over the Mexican problem and that a double guard had been ordered for Harry K. Thaw, the millionaire slayer of Stanford White, let the try another escape - the headline blared: ALCO MAKERS QUIT AUTOMOBILE FIELD. No one from American Locomotive was available for comment. The written statement of company president W. H. Marshall, who had secluded himself at Cape Cod, noted only the terse fact of discontinuation and gave assurances to owners that guarantees would be fulfilled and repair parts available for a period of not less than five years. From Providence it was learned that most of the 1200 employees in the automobile department had already been given thirty days notice.

Two days later, on August 24th, American Locomotive revealed its overall gross earnings for the fiscal year - \$34,000,000, the largest in company



Alcos from 1912: the standard touring car (top) and limousine (on the facing page) models - and two custom variations, a two-seater roadster (left) by Fleetwood and the rakish four-seater (above) that Alco built for William K. Vanderbilt, Jr., following the design ideas submitted by the millionaire sportsman himself. At right are the opening pages of the 1913 Alco catalogue, an altogether surprising turnaround from the usual Alco promotion.

history, President Marshall's rosy report to stockholders mentioning only that automobile manufacturing had been discontinued because "it was unprofitable." Six days later the news was that the company desired "to sever as completely and as soon as possible all connections with the automobile branch of the business," and the parts manufacturing facility would accordingly be sold.

Automobile Row was aghast. The situation was unprecedented. Here was a company whose \$50,000,000 capitalization made it the largest in its field, whose fine locomotives poured money into its coffers, producing an automobile of unexcelled quality in one of the best equipped plants in America, and calling it quits because it was unprofitable? Unthinkable! Yet there it was. The company investment in automobile manufacture was estimated between \$4,000,000 and \$6,000,000; on the record was the fact that \$2,300,000 had been placed in reserve for loss in liquidation and that only 5000 units - in fifty-four varieties - had been manufactured during the company's seven short years in the field. It was simple arithmetic which brought the conclusion mentioned in the beginning of this article that American Locomotive had lost an average of \$460 on each vehicle built.

Amid amazement throughout the automotive field that such losses could be sustained without anyone outside the company being aware of them, American Locomotive officials generally kept mum. Those who were willing to say anything would say it only if their names were not used, and they didn't say much. Significantly, Alco's automobile division was mentioned - glowingly, of course - in annual stockholder's reports only for the years from 1906 through 1910, with the next mention being cessation notice in the 1913 report. Apparently

even American Locomotive officials had not been completely aware of the magnitude of their problem, or did not wish to face it, until 1912 when the board of directors appointed a committee "to find out why the automobile department wasn't making money." (It was in March of that year, incidentally, that Harry Houpt, who certainly saw the writing on the wall, left the company to take on the New York agency for Lozier.) The committee in turn passed the buck to two "expert investigators," these being R. G. Averill, brother of Mrs. F.

H. Harriman, and J. W. De B. Gould, brother-in-law of Pliny Fisk, whose firm handled matters financial for the company. Concluding their investigation, these gentlemen suggested that American Locomotive build a light six model and a five-ton truck - and stay in the automobile business. Apparently three light sixes were completed and running when the end came, but the truck was not. A hundred thousand dollars had been the outlay. (Curiously, a five-ton truck was mentioned casually in the 1911 catalogue as "now being offered." One wonders if it really was.)

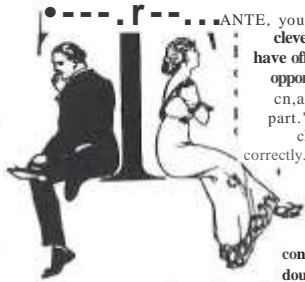
And still the question begged: why? The answers came in torrents. The company had made mistakes from the beginning. Locomotives are bought; automobiles must be sold. As one insider lamented, "[Alco] expected the public to form in line on the left and take what it put out." The company did not recognize the shifting public taste in motorcars; it wished to dictate what the public should have, not give the public what it wanted. There is nothing wrong with that, one supposes, except that in this case it didn't work. Certainly the emphasis shift in promotion from the technical to the luxurious was belated recognition that the company's approach to selling its cars was wrong. One



THE WHITE BAND

Dr. ETHEL LLOYD PATTERSON
[U.S. PATENT 1081 N. A. POPP]

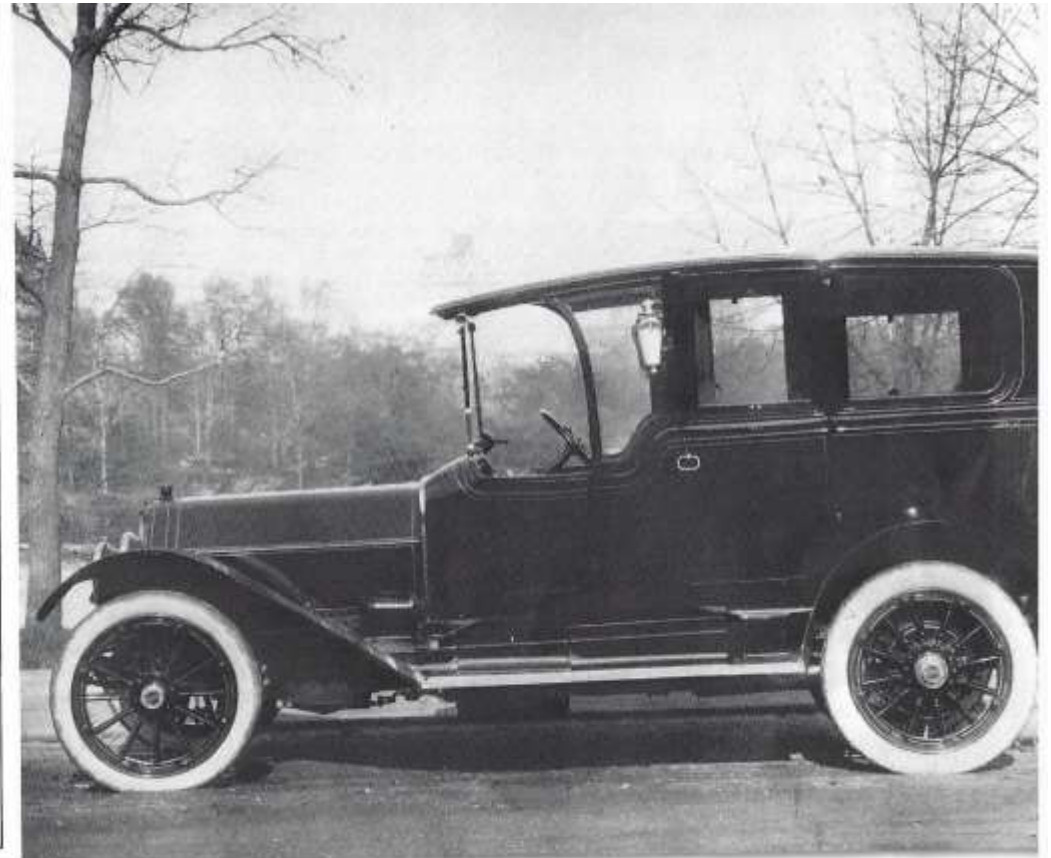
No. 718 Fifth AVENUE,
Friday, July 14th, 1912

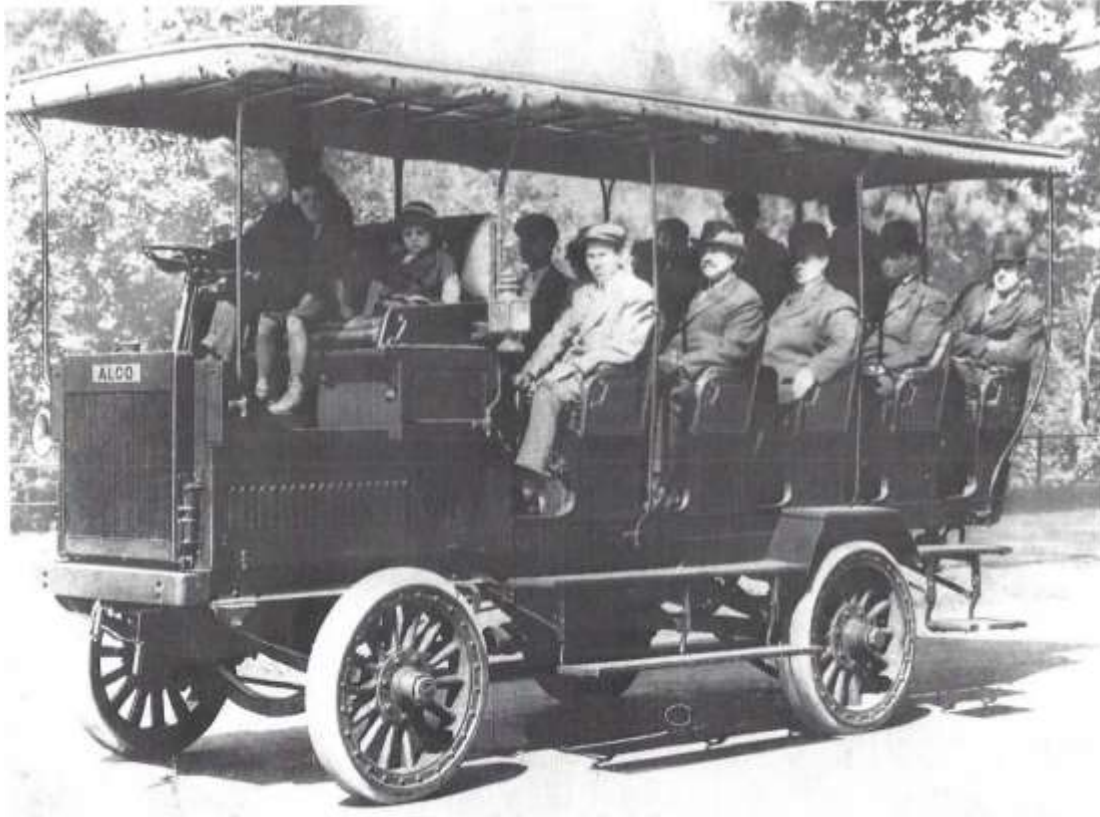


... ANTE, you an, clever person. Jwot how clever remain to be seen. You could not have offered to lendw your Alco at a more opportune moment. For- li, teu, adorable cn,ature-Fred and I have- " decided to part." Am I abrupt? Doe, it aound midd& cIMII Yet, I believe I ue the formula correctly. When t wo people married to each other make up their mind to get unmarried, I undert&nd they wually up ,... th eir intention in aome luch manner. It contain, a hint of the bourgeoia. no doubt. However, perhapI that ii true of all emtioDII- leco.oui be an emotion.

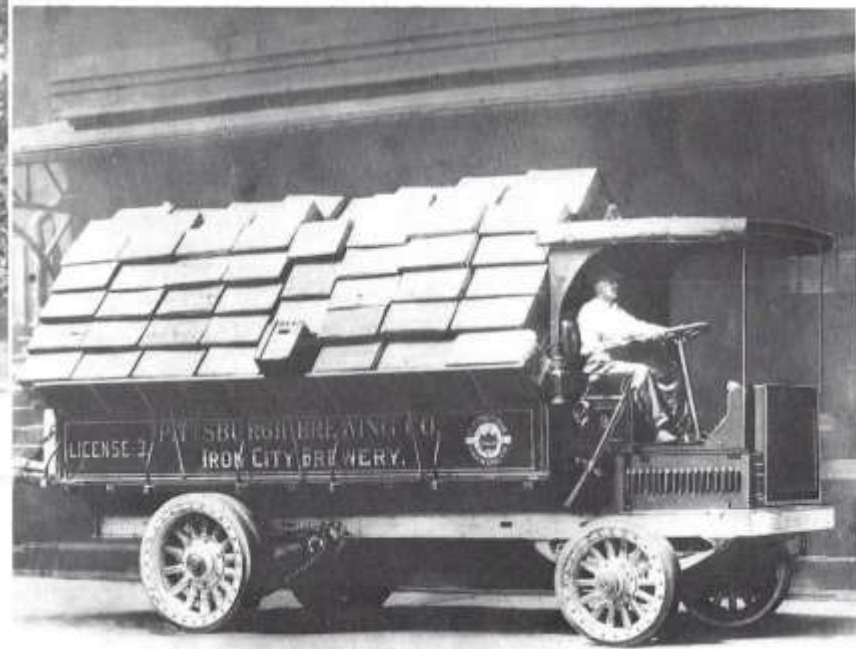
Now don't raise your dear hand, and eyebrows at me! All this, is,.... You not to be in the leu t vulgar. I promise. Aparting de lwe, dearTante. Thanka toyou, Fred and I hope to make of the whole a ffair quiteacharming litUe "lark." But we do need your Alco to do ao. 0 - we need it very much. No-there is no elopement. Neither Fred nor I have the type of throat that allowwI trianalea. We are, u you know.Tante. modem. But, no t- impoeaible.

But where wu II 0, yea your lovely new Alco, T&lite, at our door please, at nine of the clock next Monday morning. We ahaI ho more careful of it than we have been of our own happineu. Be.idea, did I not





Although admirably built, such Alcoa commercial vehicles as the 1912 sightseeing bus (left) and express truck (below) could not have advanced the luxury image of the marque itself; the company ultimately preferred the dubious distinction of motor car manufacturer altogether to concentrate entirely on the latter.



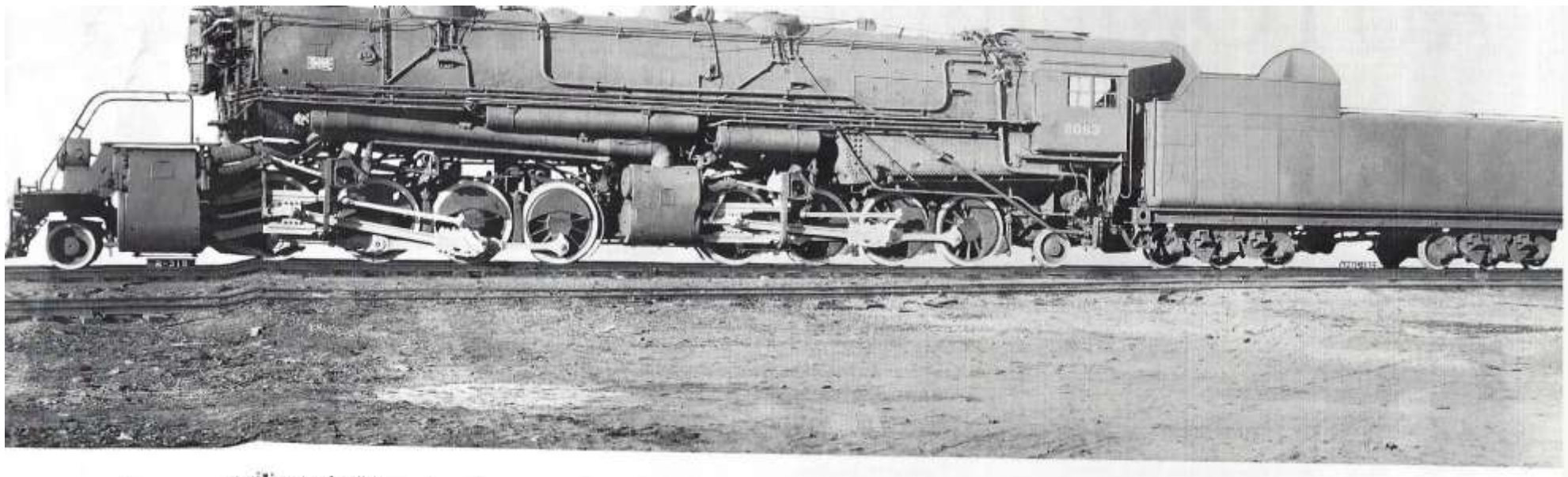
might have wished also that once Alcoa had committed itself to racing that it would have done so more wholeheartedly and taken maximum promotional advantage of the unprecedented double win of the Vanderbilt. But the company's advertising appropriation was scant until Harry Houp's entrance on the scene - and that was in 1911, when the Alcoa triumphs were old news. Though it might be argued that a racing image was incompatible with a luxury car, it certainly was compatible with the masterfully built, technically superior, consistently dependable Alcoa as initially promoted - and in those days, an impressive racing heritage was no thing less than a plus for any car company.

Then there was the endless variety of Alcoa's available body styles, plus the customs for anyone desiring them, all produced without a thought to standardization, save for the most minimal of mechanical details. Whether the proposed light six, manufactured with some recognition of the value of standard volume production, might have helped is debatable. The rewer light sixes on the market already, though probably Alcoa would have built a better one. Alcoa's tardiness in considering such a model was typical, however, of the company's usual practice in manufacture. Alcoa was always late. Certainly its Providence location ran up the cost of getting raw materials to the plant and contributed to the delay factor (though other remotely sited factories coped with the problem), - still one wonderer if that was the principal reason that, as reported, fully one-third of its production during some years reached the market after the season had closed. It was rumored that Alcoa ultimately kept these come-lately models and sent them back down the production line to be facelifted in to the next season's crop, an expensive proposition.

But everything about the Alcoa was expensive. This writer is loath to imply that the Alcoa was simply built too well, but certainly the cost-conscious approach in this instance resulted in incredible waste. One embarrased Alcoa official, when asked about the \$165,000 worth of machinery installed to turn out about 250 or a month's work worth of rear axles a year, blustered that the cost was probably nearer \$7500 or \$8000 (his own calculations, of course, gave the lie to that) and the \$51,000 drop-hammer used for locomotive forgings the rest of the year. Conceivably the company might have contracted to make standard parts for other companies and thus amortize the cost of the massive machinery investment, but this was not considered. Alcoa was too proud to do that, and perhaps one can't blame them.

What the company can be blamed for is the devastating lack of communication from sales to purchasing, from engineering to shop - in 1912, for example, the sales department advised the purchase of material for 800 trucks. Purchasing bought material for 1600. About 750 trucks were sold that year. Various other reports told of special steels being procured to make 5000 gear boxes for 500 cars, of 2700 axles being made for a custom model of which only a dozen or so were built, of the foundry continuing to merrily turn out production parts already obsolete simply because someone forgot to tell them not to. The reports may have been a bit exaggerated, but one wonders how much in view of the incredible amount of money the company lost.

Alcoa lost money, too, in simply being so good to its customers. Few companies dealt so honestly and liberally; the Alcoa service department was a model which many another company tried to emulate. Moreover, Alcoa was widely



known as a "willing trader," happy to make generous allowances for old cars in exchange for new ones. (This wasn't done much then - and Alco apparently could never figure out what to do with the used models.) One unnamed company director even suggested that another problem was Alco's refusal to indulge in the practice of bringing chauffeurs to recommend the cars to their employers.

And once a wealthy client was hooked for Alco, what perhaps did he think, traveling along in his cushy limousine down some altogether splendid boulevard and steering approach him a three-ton truck or a taxicab bearing the same name? One American Locomotive official offered an answer to that which indicated that it really didn't matter, that the manufacture of automobiles was begun only to lay the basis for a "proper factory" which would eventually be turned over completely to commercial vehicle production. That this was indeed the plan is lent credence by the figures for 1912: eighty-five percent of Alco sales related to trucks, a mere fifteen percent to passenger cars. Still it's doubtful that Alco was really doing much better in this area; the company allowed itself a profit of but fifty dollars on each truck unit produced, an impossible margin for survival.

Even more mind-boggling was Alco's handling of its taxicab business, which too toward appearances should have been a thriving one. But that was quite impossible in the Alco lost eighty-five dollars on every one of the cabs it sold. And yet it kept right on selling them! For four years! Without any change in either price or design! Quoted by *The New York Times* about this, an Alco official said that he did not care to go into detail but that since the Alco had gone out

of business because it had lost money it was obvious that it must have lost money on certain vehicles." Talk about understatement.

There was, however, a positive side to the sorry debacle, which Albert W. Atwood, writing in *Harp's Weekly*, saw as a "revival of financial democracy." American Locomotive stockholders became angry. Early in October of 1913 one of their number, Isaac M. Cate, delivered a fifty-page broadside against the company, questioning the handling of the automotive venture and laying fierce ly into the conduct of the locomotive department as well, with allegations of conflict of interest among company executives and collusion with tool supply and castings companies, among other charges. American Locomotive's reply proved Cate in error on some specifics but in general was, in A. W. Atwood's words, "a grudging and cautious but sweeping admission that [he] was right." (This writer's favorite of the American Locomotive answers to specific charges was the explanation for the extravagantly high salaries paid company officers: it was to "put dignity in the eyes of the railroad officials" who were the purchasers of locomotives.) A committee of inquiry aided by another advisory group routinely absolved company officials of any wrongdoing in March of 1914, preferred dividends poured forth later that month, in June and in August - and in September there was a wholesale change of officers at the top level of management.

But it was too late for the Alco automobile. And that was the saddest of all. For in the welter of facts and figures, the charges and countercharges, the rumors and innuendo that accompanied its demise, nobody ever said that the Alco was not a great car. ☹

Notes & Photo Credits

Born in London in 1921, PETER HULL has spent most of his life as a flying instructor, both R.A.F. and civilian. His formal introduction to Alfa Romeo came in the late Forties when his brother raced a 1930 1750; subsequently, in 1955, he bought his own Alfa, a 1927 RLSS 22/90, and ran it until 1968. His first book, *Racing an Historic Car*, was published in 1960, written as a result of sharing an E.R.A. with his brother and racing it. Other books written by Mr. Hull include *The Vintage Alvis The History of the Vintage Special Car Club* and the most successful *Alfa Romeo-- A History*, written with Roy Slater and first published in 1964. He has recently collaborated with Mr. Slater again on a biography of Tazio Nuvolari, due to be published in the Ballantine series. In 1971 he was elected Secretary of the prestigious Vintage Sports-Car Club having been a member for thirty-four years.

Born in London in 1946, SIMON MOORE is an engineer with an intimate oil company. His interest in Alfa Romeo was first manifested in the mid-Sixties, centering mainly around the eight-cylinder cars, though Mr. Moore did for a time own a 1930 unsupercharged twin-ohc 1750 convertible. His writings include various articles in such club publications as "Ferrari," the Vintage Sports-Car Club "Bulletin" and the Auburn-Cord-Duesenberg "Newsletter."

COVER

Illustration by Harvey Winn.

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Photograph by Don Vorderman.

TRUNDLING ALONG WITH TRIUMPH

116-117: Brockbank cartoon reproduced with the kind permission of IPC Transport Press, Ltd.

The author wishes to thank James Bradley of the Automotive History Collection, Detroit Public Library, Alice S. Dick, Rudy Keck, Karl Ludvigsen, and the Society of Motor Manufacturers and Traders' Loan, along with Mike Cook and John Dugdale of British Leyland Motors for their help in research.

Pre-1940 Triumph Owners Club, 8 Partrick Road, High Park, Stourbridge, England

Triumph Club of North America, 15116 Partenia, Sepulveda, California 91343.

Triumph Roadster Club, 69 Croydon Road, Beddington, Croydon, Surrey, England

Triumph Sports Owners Association, 600 Willow Tree Road, Leonia, New Jersey 07605

TR Register, 2A Offerton Road, London SW4, England.

PONTIAC'S GREAT GRAND AM GET ONE QUICK BEFORE THEY CHANGE IT' 146-147: Photograph by Joseph A. Bilbao. 149, 150, 152-153: Color photographs by Don Vorderman. All other photographs courtesy of General Motors Styling.

A PACKARD BY DIETRICH--ONE OF THE MOST BEAUTIFUL CARS WE'VE EVER SEEN Color photographs by Don Vorderman. Pre-restoration photos courtesy of Bob Turnquist.

Eastern Packard Club, Inc., P.O. Box 153, Fairfield, Connecticut 06430.

Packard Automobile Classics, Inc., P.O. Box 2808, Oakland, California 94611.

Packards International Motor Car Club, Inc., P.O. Box 1347, Costa Mesa, California 92626.

Packard Automobile Club of Australia, c/o E. McMahon Glynn, 46 Almore Street, Mosman, New South Wales, Australia.

"!ST DAS NICHT EIN KABEN IN ROLLER?" "JA! DAS IST EIN KABINENROLLER!"

164 above: Courtesy of Dr. Paul Simsa. 164 center left and right and bottom: Courtesy of Fahrzeug und Maschinenbau GmbH. 165 below, 168: Courtesy of Les Klinge. All color photographs of Messerschmitts, from the collection of Les Klinge, by Don Vorderman.

The author wishes to express his appreciation to Dr. Paul Simsa for his invaluable assistance in the preparation of his article.

UNDER THE BUBBLE: A SHORT FLIGHT IN A MESSERSCHMITT KR 200

172-173: "Red Baron" helmet and goggles courtesy of Eaves Costume Co., Inc.; aviator courtesy of Joseph A. Bilbao. 172-173, 175, 176 right: Photographs by Don Vorderman. 174, 177: Photographs by Joseph A. Bilbao. 176 left: Courtesy of Les Klinge.

Messerschmitt Owners Club--U.S.A. Division, c/o Les Klinge, 59 Sylvan Way, West Caldwell, New Jersey 07006.

Messerschmitt Owners Club, c/o L. Tilbury, Eleanor Cottage, Little Braxted, Witham, Essex, England.

THE IMMORTAL ALFA ROMEO "TWO-NINE" 178 above: Courtesy of Alfa Romeo S.p.A. 178 below, 179 below: Courtesy of the Simon Moore Collection. 180-181, 182 below, 184 above: Courtesy of Luigi Fusi. 182-183 above, 183 below: Courtesy of L'Editrice dell'Automobile. 182 center, 184 below: Courtesy of Museo dell'Automobile Carlo Biscaretti di Ruffina. 184 center: Courtesy of Autocarmagazine.

185 above: Photograph by Dr. Vicente Alvarez. 185 center and below: Photographs by A. F. Ioyens. 186: Photograph by Jerry Chesebrough (*Road & Track*). The author would particularly like to thank Keith Hellon and Jonathan Thompson for assistance in the preparation of this article.

Alfa Romeo Owners Club, P.O. Box 331, Northbrook, Illinois 60062.

Alfa Romeo Owners of Southern California, Box 261, Los Alamitos, California 90720.

Alfa Romeo Section of the Vintage Sports Car Club Ltd., The Old Forge, Quarr, Buckhorn Weston, Gillingham, Dorset, England.

Registro Italiano Alfa Romeo, Francesco Sanovetti, Via Gerolamo de Carpi, Rome 6, Italy.

Vintage Alfa Romeo International (VARI). 900 N. College, Fort Collins, Colorado 80521.

LIVING LEGENDS:

ALFA ROMEO BC2900 B MILLE MIGLIA

191 above: Courtesy of L'Editrice dell'Automobile. 190-191 Photograph by Marty Slaninka. All other photographs by Don Vorderman.

IMPRESSIONS OF A TWO-TIME VANDERBILT CUP WINNER

196-197, 198 below left, 199 below right, 201, 202 below, 203: Photographs by Don Vorderman. 198 above, 200: Photographs by Stan Nowak. 198 below right, 199 below left, 202 above, 204-205: Photographs by Joseph A. Bilbao.

THE MIGHTY ALCO: A HISTORY

206-207: Peter Helck painting from the collection of Joel Finn. 208, 210 right, 211 right, 212 right, 218 above right, 219 right, 220: Courtesy of the Long Island Automotive Museum. 209, 213, 215: Courtesy of the Automotive History Collection of the Detroit Public Library. 210 left, 211 left, 214 left, 216, 218 left, 219 left: Courtesy of Joel Finn. 212 left, 214 right, 217: Courtesy of Peter Helck. 221: Courtesy of C. W. Witbeck and *T rains* magazine.

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