



story by LeRoi Smith
Ancient man had a rudimentary method of moving something, he pushed it around on logs. Now, some 5000 years later, we're still using something that he invented. The difference is that we've made them out of steel instead of wood and we call 'em

Fire made man independent, but the wheel made him really mobile. In the modern age of human versatility, nothing takes on quite the importance of movement, and surface movement is almost entirely relegated to the use of a wheel in one form or another. To the average motorist, and especially to the hot rodder, the wheel is one of the most basic necessities of an automobile. Yet what is a wheel? Who invented it, what has been its development, what is its future? This is the first in a series of articles dealing exclusively with that insignificant round object that supports your car. We'll deal with wheel history and technology, wheel use and finally, the special wheels so popular in hot rodding.

In the beginning, man walked. To move something big, he either carried it piece-meal or gathered the gang around for a little tottin' party. If the object were too big, it stayed put. Then the Elamites came along. No, they aren't something that is discussed in chemistry, they were a people. They lived in one of the five cradles of civilization some 5000 years ago in the Tigris-Euphrates Valley, a section of the world now known as Iraq. These boys must have had some mighty big packages to haul around, for history records them as the initial users, or inventors, of the wheel. But even they arrived at the solution rather rag-tag. The Elamites were the first to use a wheel that revolved about its own axis. Prior to this, the Paleo-hot rodder used logs to roll things around on.

Not a bad system, but then a person got rather tired carrying logs around to the front of the moving object and now and then someone was always stumbling up front and gum-

jobbies. The Nile River Timing Association might have experienced some qualms over the new wheels showing up on quarter-mile chariots, but the spoke and rim method of building wheels was in to stay.

Variations on this last theme were many, probably with the proprietor of Ye Olde Speede Shoppe in the lead. The number and size of spokes were both increased and decreased, etc, but in one form or another, the spoked wheel remained in fashion for 3400 years or so. Wheel designers were scarce in those days. The return of the disc wheel began in the 1920's. Thus, the evolution of the first wooden disc to the modern steel disc wheel took over 5000 years. Sort of a controlled development program, one could say.

Right now might be a good place to submit some definitions. As in any specialized business, the people directly concerned with development, manufacture and maintenance of wheels wish that several terms as applied to the wheel become more generally known and used. That part of the wheel which supports the tire directly is called the rim. The dish-like part that is connected to the inner part of the rim and bolts directly to the brake drum or hub is called the disc. When connected they are called a wheel. The flat part of the disc that positions against the drum or hub is generally called the mounting face. The distance between this mounting face and the centerline of the rim is called the offset, a term that comes into play prominently when discussing wheel modifications. In the second part of our wheel story series we'll be talking at length about offset.

Tire and rim development have progressed hand in hand up to the present time, as may be expected. Although the

WHEELS WHEELS WHEELS



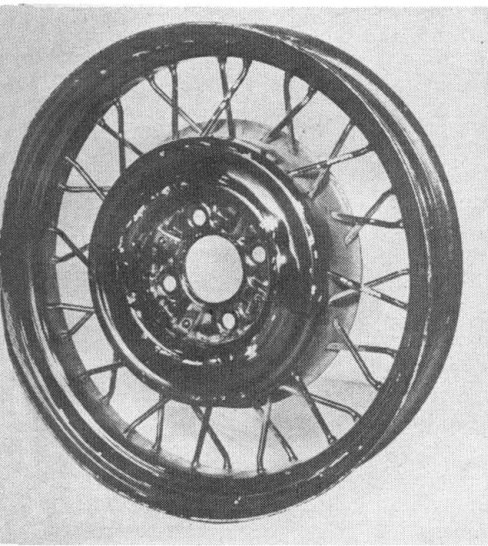
ming up the works. A step forward came when the logs were notched and located under the vehicle by pins, but then mileage per notch wasn't anything to crow about. The center of the log roller was then carved or burned down to a smaller diameter while either end was left the original size. Rather crude but it worked. All that was left was to free the end rollers from the axle.

That's where some rodder in the Elamite ranks came in. He must have recognized a good thing when he saw it and decided to corner the wheel market. But alas, another tribesman came along and had the metal shapers work up some iron bands for increased wear. Traction hadn't yet become very important. For the next couple thousand years this kind of wheel remained the thing for the "in" set until about 1300 B.C. when the Egyptians came up with some racy

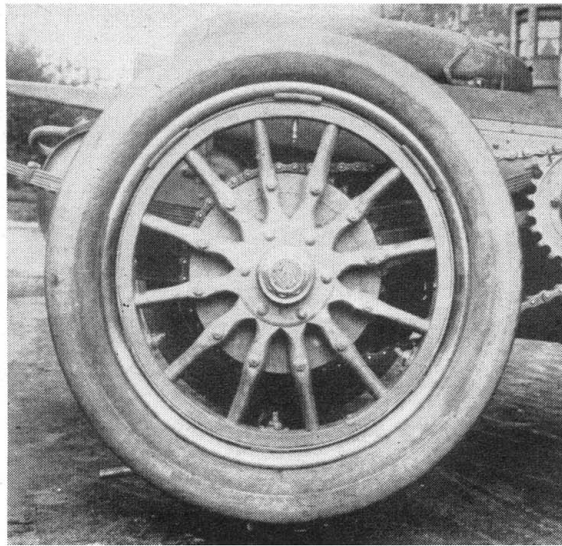
Specialists in the automotive and truck wheel business, like Bob Schleicher of Motor Rim and Wheel Service of California, are vitally interested in wheel development and use. Experts should be consulted before any wheel change.

major development of the wheel didn't really get underway until the automobile became a prime motive factor after the 1900's, indications of rapid development began to show up in the late 1800's. Some wagon wheels changed from steel bands to solid rubber fixed tires on wooden spokes. Large and small bicycle type wire wheels showed up, along with pneumatic, high pressure tires. The clincher type fixed rim was introduced and motorists could carry an uninflated spare tire but spare wheels and rims weren't generally

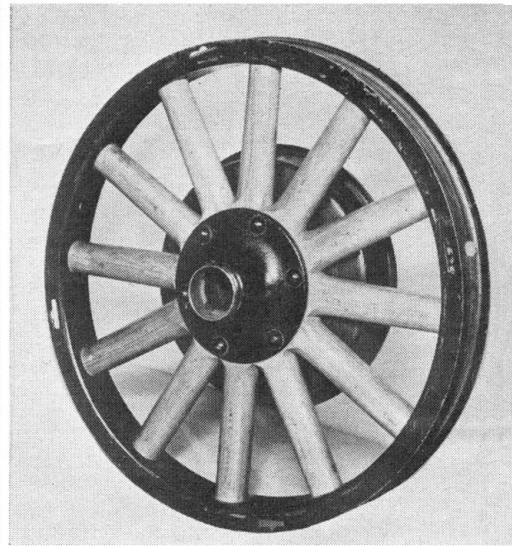
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This 1930 Hudson Terraplane steel wire wheel featured riveted spokes and was a boon to mass production.



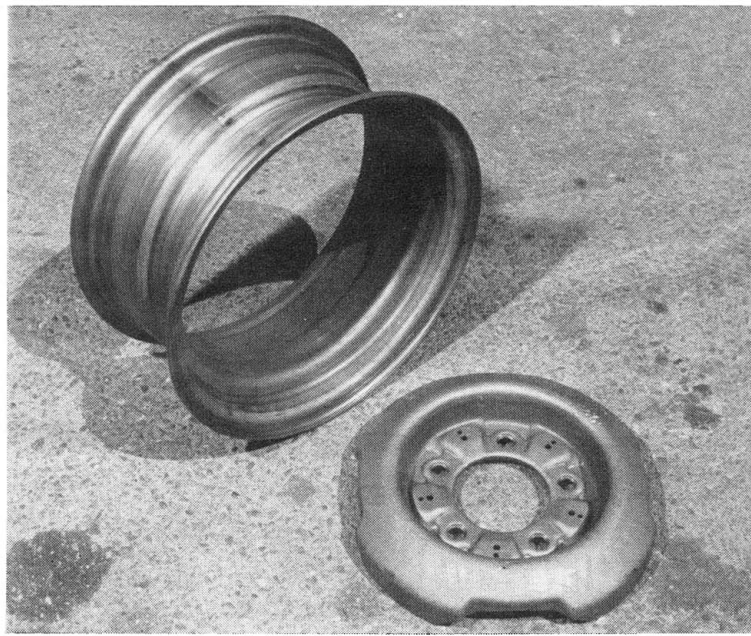
This jazzy number was on the Simplex Sport car of the bygone era, featured a steel drive drum bolted directly to the wooden spokes.



The 1926 Chrysler was fitted with a natural wood spoke wheel but wooden wheels were on way out.

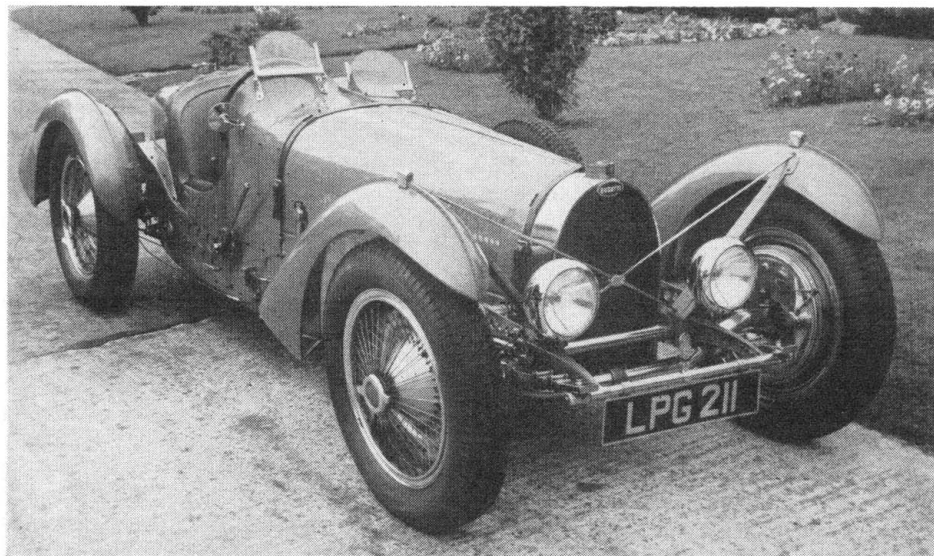
WHEELS, WHEELS, WHEELS, *continued*

photos by Motor Wheel Corporation, Eric Rickman

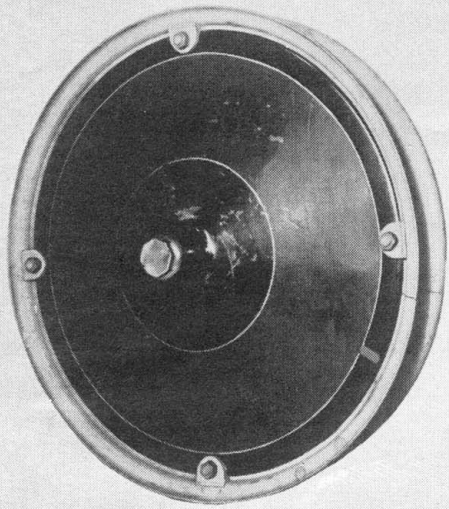


ABOVE—Before assembly, the wheel unit consists of two pieces, the welded rim and the pressed steel disc.

ABOVE LEFT—The three types of disc and rim mating now most commonly used include rivet, left, spot weld, right, and forming of rim material into sunken rivet, top. Wheel at left is rare, has double center.



The pre-WW II Bugattis were famous for wheel styling, such as the "piano wire" wheels on this Type 59. Exotic wire wheel styling was prominent on classics of this decade.



This 1928 Ford double disc steel wheel featured demountable split rim, forerunner of present wheel.

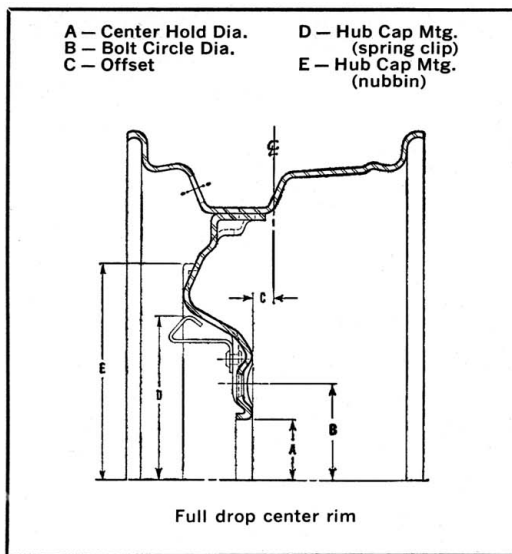
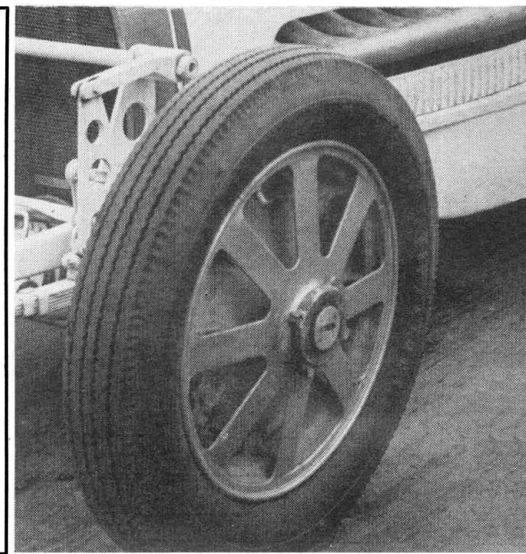


Illustration from Motor Wheel Corp. catalog shows relationship of wheel disc and rim. Offset (C) most affects hot rodders.



Type 54 Bugatti used unusual metal wheel with flat outer spokes, inside bolted to huge brake drums.

illustration by Steve Swaja

carried. The next logical step (1904) was a demountable, clincher type rim for wooden spoke wheels thus allowing the motorist to carry an inflated spare tire on a demountable rim. Ummmmmm, boy, did that ever ease the pain of a Sunday cruise!

By 1905 a universal rim had been developed. Wire wheels became standard equipment on all cars by 1913, as did demountable rims by 1915. However, the wooden spoke wheel remained in partial use until the 1930's. Incidentally, if you have never had the experience of trying to mount a tire and tube on one of the old demountable rims, you've missed a gasser.

During 1919 and 1920, the Budd-Michelin Company introduced a steel disc wheel with clincher type rim and separate hub that caused great interest at the New York Automobile show. The new wheels were on an Elgin. If you don't go back that far, you're gonna have to consult dad on that one. The simulated wood, or "artillery," steel spoke wheel came in the late '20's. This wheel was built to compete with the wood spoke wheels which were beginning to show problems on the new, more powerful cars. At this time all four types of wheels were in general use - wood spoke, wire, steel spoke and disc. The lumber industry naturally wanted the wooden spokes to remain, but the steel advocates leaned toward the other three.

Disc wheels with demountable rims first appeared in 1927 as the trend toward smaller wheels began. At this time, riveted wire wheels came into their own also.

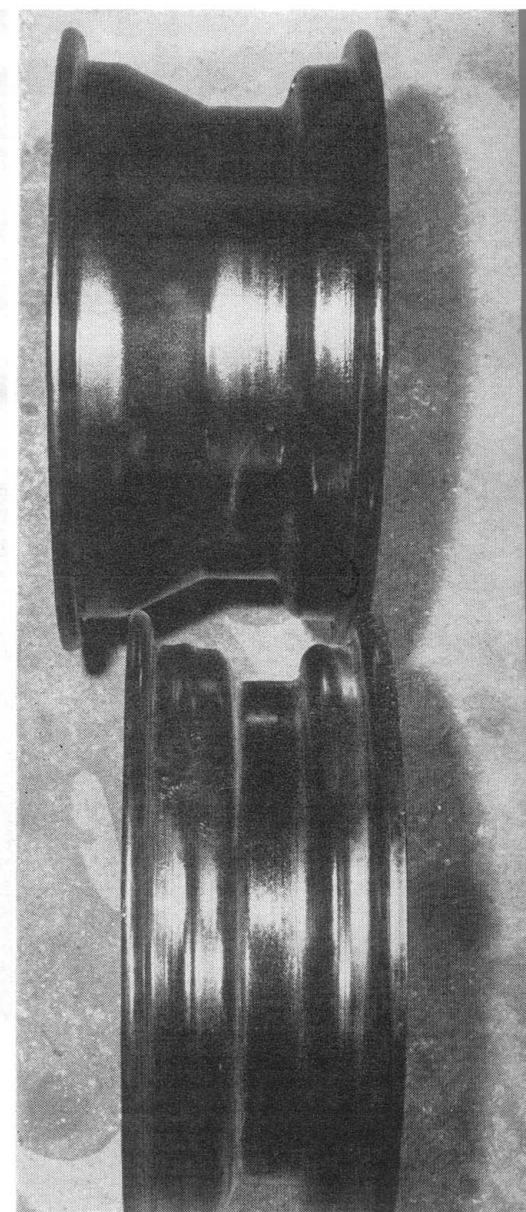
During the late 1920's and early '30's, the wheel manufacturers were looking

strongly toward the steel disc wheel designed with a separate hub and drop center rim. This is essentially the wheel design in universal use today. With the introduction of the fixed rim and separate hub, the disc wheel gradually eased the other styles out of the picture as far as mass production was concerned. Wire wheels remain in use, but more from an esthetic standpoint than anything else. Of course, wire wheels remained for a long time on racing cars, partly because of a strength/flexibility factor desired by the car owners and partly because of brake heat dissipation. Even so, the wire wheel is leaving that scene behind now, what with the development of new, lightweight alloy wheels especially for racing purposes.

During the early development stages of the wheel for general automotive use, any number of small companies came into being, each with its own particular idea. And there were some really fantastic results. The most interesting trend was the attempt to smooth out the ruts in the roads by building wheels that actually incorporated a springing action within themselves. This was done by connecting the rim and the hub by some sort of spring device, often springs wound around sliding spokes or large curved spring

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An inch makes a great difference when talking about wheels. The top wheel is the widest production item available, measuring 7 inches, while the bottom wheel is the more common 5-inch found on most production cars. Wide rim is often selected as a heavy duty unit, is available in both 14- and 15-inch sizes.



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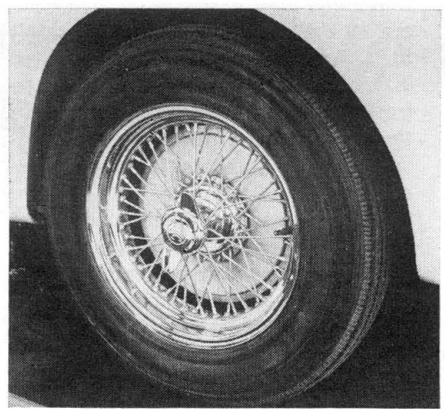
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WHEELS, WHEELS, WHEELS

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leaves that acted directly as spokes. Those wheels must have been real bears to balance. Today, however, the smaller companies have split the scene, leaving the majority of the wheel industry to the automobile companies and the big three: Kelsey-Hayes, Motor Wheel Corporation and the Budd Company.

Truck wheels were developed along a line similar to the passenger car wheels until the early 1920's when Budd introduced the dual wheel mounting. This was basically a single wheel with two rims held apart by spacer bands. The most recent development in truck wheels has been a new, very wide base wheel with one tire to replace the dual-tire setups, and new lightweight alloy that allow trucks to carry more payload.



Wire wheels, such as this one by Rudge-Whitworth on an AC, remain in common use on sports cars, mostly from an esthetic point. Alloy wheels are gaining.

The first wheel developed for use with low pressure tires was manufactured by the Motor Wheel Corporation in 1921, and in the same year this company developed the first pressed steel wheel.

Since most cars went to the all steel disc wheel by 1940, the automotive wheel has remained relatively the same. At least in the outward appearance. But wheel engineers have been in high gear and cranking 10,000 rpm at the drawing boards.

With the designers and stylists calling for lower and lower body shapes, wheels have become smaller and smaller in diameter. To compensate for this reduction in diameter, they've also gotten wider and wider, especially on the heavier cars. The car braking system has been a single determining factor in wheel size and location, too, since a too-small wheel restricts air flow around the brake drum and it becomes virtually impossible to stop that big bear. It has

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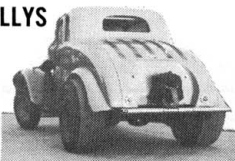
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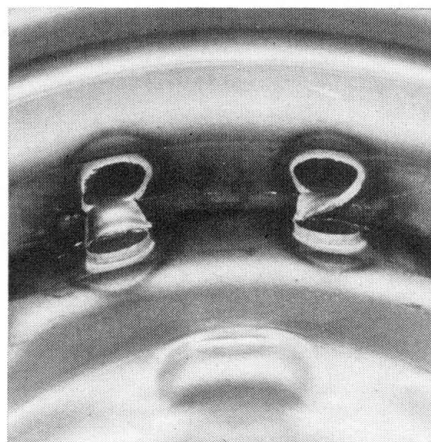
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been noted in the trade during recent months that some auto manufacturers are going back to larger wheels, probably because of this brake problem, but many wheel companies don't believe that a definite trend has yet been established. At the same time, brake engineers have been working with a new drum design that puts a large portion of the drum out into the airstream again. This drum looks for all the world like a mishaped dishpan, but it is finding more and more favor on new cars.

But what about versatility in selection of wheels. Although they seem an almost insignificant part of the overall automobile, they play a great part in its dependability and performance. The majority of motorists like what they have just fine, but there are others that need a slightly different application for one reason or another. This might be



A common test of strength of Electro-fuse process used by Motor Wheel Corp. to mate disc and rim is pressing a wheel apart. Note that weld itself is strong, tearing the surrounding metal.

taken care of through swapping wheels, but we'll take up that aspect in the next article. Generally speaking, the special driver wants a heavy duty wheel. This may be taken care of by asking the automobile agency for such a wheel, which is usually listed in the catalogs as a Police or Heavy-Duty option. Usually, this wheel is merely wider, nothing else. In some isolated cases, wheels may be found that are made of heavier gauge metal or have double centers a la Nascar, but they are rare and not generally available to the buying public.

If the search for a more specialized wheel fails to produce anything, the motorist should consult his local major tire store. They normally have appropriate information and, if not, they can contact their nearest wheel and rim dealer for assistance. Incidentally, there

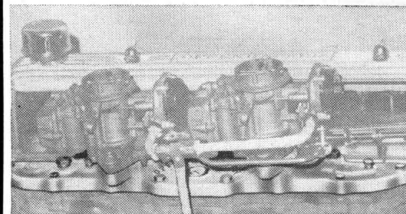
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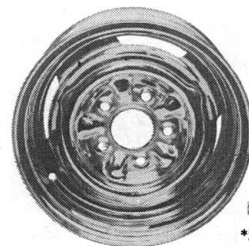
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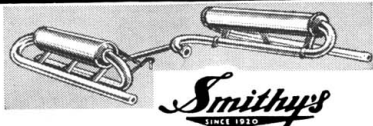
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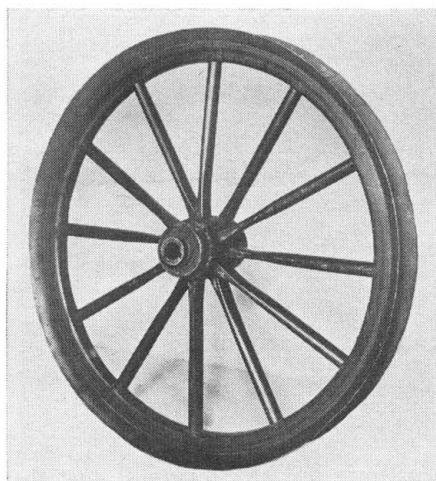
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WHEELS, WHEELS, WHEELS

continued

is an organization known as the National Wheel and Rim Association in Jacksonville, Florida, that sets basic standards for wheel manufacturers.

Wheel maintenance has become almost a thing of the past. But there are still certain things that the average motorist and Joe hot rodder should be aware of. Generally speaking, wheels may either crack or will be bent under adverse conditions. If they are bent by some severe blow they may often be straightened by a good wheel shop. If they have been cracked, which is usually easily seen upon periodic inspection, there is little hope. Under no circumstances should heat be applied to a wheel

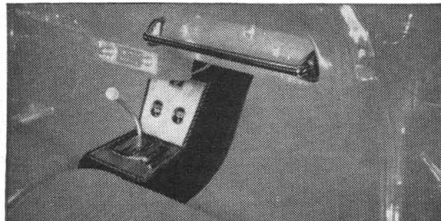


Probably as simple as they come, the 1904 Oldsmobile wood-spoked wheel was straightforward in design and shows natural evolution from wagon wheels.

as a repair measure. The stress built into the wheel is then disturbed and it is susceptible to failure. One more note. We understand that the automotive manufacturers are vitally concerned over owners modifying their wheels. Years ago, there was a great deal of safety factor built into everything in a car, but through the years this factor has been reduced until the present when the margin is much less. A wheel has been engineered for a car, and any major deviation is frowned upon. So much so, in fact, that the manufacturers are not prone to guarantee the undercarriage of any car that has had the wheels modified.

Next month we'll be going into the interchangeability and adaptability of wheels, so stay tuned for the complete story on wheels and how they may be interchanged with complete safety. ■■

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