

Everything **on**
WHEELS



The Ever-Evolving Wheel

Experts say the wheel originated around 3500 B. C. in Mesopotamia.

Initially, this technology functioned as a potter's tool before the wheel was adapted for use on chariots.

Its actual beginnings are somewhat ambiguous, but the wheel remains a remarkable human innovation.

This groundbreaking invention follows the evolution of humanity across an amazing historical timeline that continues to this day with many current applications.

REAL WHEEL OF FORTUNE

The wheel of fortune isn't just a game show. In the context of ancient Roman beliefs, the goddess Fortuna famously used an actual spinning wheel of fortune to predict the destinies of those she favored. The concept later found its way into noted cultural works throughout history, including writings by William Shakespeare and Geoffrey Chaucer, among others.

EARLY USES

Excavations in the 1940s revealed wheeled toys in pre-Columbian sediment layers in Mexico. These toys depicted animals like dogs with wheels instead of legs. Interestingly, indigenous North Americans did not adopt wheels for transportation until European settlers arrived.

MODES OF TRANSPORTATION

Between the second and sixth centuries A.D., camels became the primary means of transportation in the Middle East and northern Africa, surpassing wheeled vehicles. Historians believe this shift was influenced by the deterioration of roads following the fall of the Roman Empire.

But even though camels helped facilitate movement, wheels continued to play an essential role in milling, irrigation and making pottery.

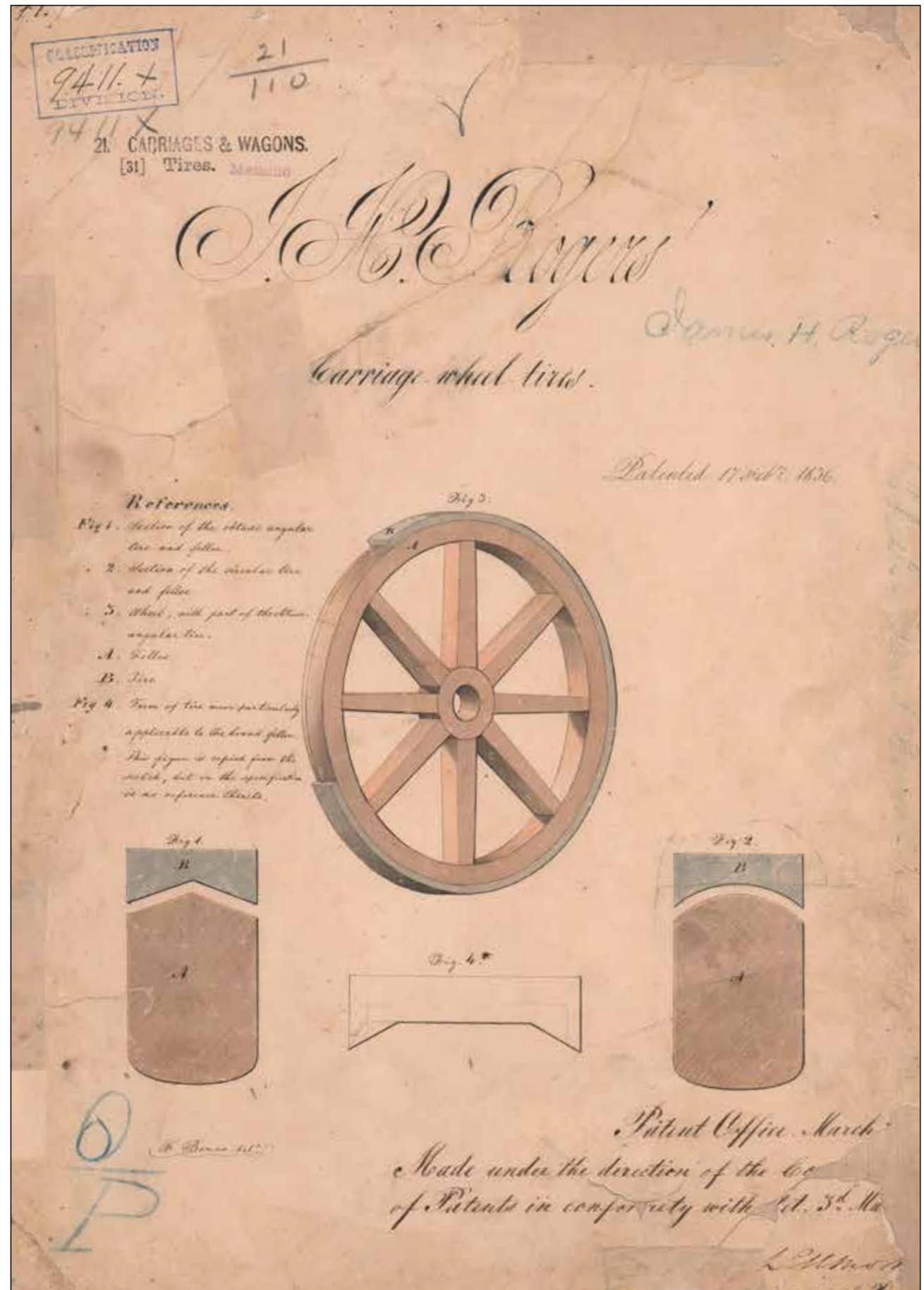
FIRST PATENT

In 1791, James Macomb from Princeton, N.J., received the very first patent for a wheel from the U. S. Patent and Trademark Office. His innovation was a design for a hollow water wheel that generated hydropower for local mills. Unfortunately, the original patent documents were lost in a fire in 1836.

ACTUAL REINVENTION?

The old saying about reinventing the wheel has been turned on its head more recently by John Keogh from Australia.

He was granted a patent in 2001 for a humorous invention that he dubbed the "circular transportation facilitation device." The goal was to draw attention to the shortcomings of the patent system in his country.





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Workhorses: The Era of Trucks

Why are trucks so popular in the U.S. right now? They've become known for dependability, their cutting-edge technology, cool customization options and an excellent resale value.

The latest models now feature big enhancements in fuel efficiency.

EVERYDAY USE

Modern trucks are among the most dependable new vehicle options available on the market today, even if you are not driving a brand-new model with a manufacturer's warranty. As long as you're performing regular maintenance, you can expect your truck to serve your needs for years — whether that means hauling, pulling or simply getting around town. In this way, truck owners can end up saving money over time simply by minimi-

zing unexpected breakdowns and costly repairs.

EXCITING NEW TECH

The days of driving around in a basic truck are over. Today's models are equipped with a wealth of technology specifically designed to enhance the driving experience. For those with a bigger budget, optional upgrades can expand the impressive range of available features. Advanced safety tech, infotainment options and navigation systems ensure that the driving experience is more convenient, enjoyable and (most important of all) safer.



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IMPROVED EFFICIENCY

Trucks were once notorious for guzzling excessive amounts of very expensive gas. But newer models are designed to be much more fuel-efficient. They've gotten there by building with lighter-weight materials and innovative new engine designs that help reduce fuel usage. There are also hybrid and all-electric models that lower or

completely eliminate the need for gasoline. These improvements are especially beneficial when gas prices shoot up unexpectedly, while in the broader sense serving to protect the environment.

These days, you can make smart decisions about your finances and practice an earth-friendly lifestyle without sacrificing performance.

RESALE VALUE

Generally, trucks are great at maintaining their resale value, and that makes them a smart choice for a long-term investment. Of course, some models perform better in resale than others, so it's smart to research all of them if you plan to sell in the future. Select a model known for slower depreciation and keep up with regular maintenance to protect its long-term value.

How Self-Driving Tech Works

Self-driving cars once seemed like something out of the script of a science fiction movie. Not anymore.

But is it actually safe to nod off while your vehicle continues down the roadway?

WHAT IT IS

As we navigate through town, high-tech vehicles now use sensors that rely on real-time information from cameras and GPS. These sensors assist with remaining in your lane, avoiding roadway hazards and parking. A crucial component in their operation is new Light Detection and Ranging technology, commonly referred to as Lidar. This system features a rotating laser device mounted on the car or truck's roof, enabling it to scan the surroundings in a continuous 360-degree manner. Information gathered from these scans is then processed to create a detailed image of the environment surrounding your vehicle.

Engineers have programmed software to identify things such as other vehicles, pedestrians, bicycles, animals and other potential roadway hazards. The vehicle's controls then adapt accordingly. The most common existing technology isn't designed so you can take a quick nap. Instead, the aim is to lessen some driver responsibilities through lane-keeping assistance,



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hands-free functionalities and adaptive cruise control.

SAVING LIVES

Experts say wider use of completely self-driving cars could significantly reduce the rates of fatalities and injuries associated with traffic accidents, which are still on the rise. Each year, tens of

thousands of people lose their lives, and the numbers are up by double digits over the past five years.

One study suggested that self-driving vehicles could potentially reduce these deaths by as much as 90%. That's critically important in a country where traffic accidents have become the second leading

cause of death.

GETTING OUT THERE

Autonomous ride-sharing vehicles are already being tested by various rideshare companies. But for now, you'll still have to drive your own car. No one is selling fully autonomous vehicles to the general public. It's still

essential that drivers maintain their full attention while using this still-developing technology. Even manufacturers who promote the latest automation still caution that their so-called autopilot functions should be operated only by an attentive driver. Keep both hands on the wheel and be ready to stop.

Get Out There on a Bike

Whether you're looking for a good cardio option or just need to get where you're going, bicycles can come in handy.

More people are seeing the advantages of this time-honored mode of transportation. After all, they're practical, environmentally friendly and low-cost.

Pedal right past traffic congestion while enjoying improvements in both your mental and physical health.

YOUR PHYSICAL HEALTH

One major advantage of cycling is its beneficial effects on physical health. Regular biking can tone muscles, enhance cardiovascular strength and decrease the risk of chronic diseases. As a low-impact form of exercise, riding a bicycle is well-suited for individuals dealing with joint discomfort or other mobility challenges.

Cycling also serves as an excellent aerobic workout, and that helps burn calories and manage your weight.

Experts say that riding a bike can significantly reduce the chances of developing heart disease, diabetes and stroke. One study found that individuals who cycle to their workplaces are almost 50% less likely to experience heart disease and 45% less likely to develop cancer. As you pedal, you're boosting lung capacity.



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YOUR MENTAL HEALTH

Beyond its physical benefits, cycling positively influences mental well-being. Engaging in regular physical activity like riding a bike has been documented to ease symptoms of both depression and anxiety. Riding outdoors also allows us to appreciate nature while exercising, and

that promotes relaxation and mindfulness.

THE BIG PICTURE

Biking acts as an environmentally friendly transportation option that helps lessen traffic congestion and air pollution. Riding a bike to work or school can save money on fuel and parking. Several

cities have started bike-sharing initiatives and constructed bike lanes in hopes of enhancing accessibility and safety for cyclists.

Biking also offers a fun and health-conscious way to run errands or explore the world around you. Add gear like a bike basket and you can easily transport books, groceries or

other items by bike.

Bike-friendly resources including racks and storage lockers are more common these days, too.

Just remember to take safety precautions to protect yourself. Always wear a helmet and carefully maintain the bike, including tires and brakes.

Understanding All-Wheel Drive

There have never been more options for new vehicle buyers, from infotainment to various trim levels.

One of the most asked-about upgrades for hardworking trucks and SUVs are four-wheel and all-wheel drive.

While the latest technology, such as bigger screens or upscale upholstery, makes a case for itself, the pros and cons of these two driver options may not be as obvious to newcomers. Wondering how to make the best choice for your needs?

FOUR-WHEEL DRIVE

Four-wheel drive systems operate through a set of gears called the transfer case, which is designed to distribute power to both the front and rear of the vehicle. The system powers each axle, turning all four wheels simultaneously. Typically, drivers only engage four-wheel drive in rugged conditions like off-roading. So four-wheel drive remains inactive until the driver manually switches it on. In the past, drivers actually had to exit the vehicle to activate old-fashioned manual-locking systems. Modern technology has streamlined this process, allowing drivers to engage the



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four-wheel drive capability with a handy cabin switch.

ALL-WHEEL DRIVE

In contrast, all-wheel drive systems are always active. They do not require manual activation. Instead, they respond to sensors that detect any loss of traction. When a software program receives this information, the onboard computer

orders the precise amount of power necessary to maintain an optimal grip on the road. All-wheel drive systems don't use transfer cases. Instead, there's a center differential that channels power from the transmission to both the front and rear axles.

PROS AND CONS

Do you live in an area where

weather conditions or elevation pose regular challenges? Are you commonly off-road? If so, having either four-wheel or all-wheel drive can be highly beneficial since they improve traction and handling while adapting to changing conditions. The systems are also particularly useful for transporting heavy cargo.

At the same time, however,

keeping your truck or SUV in rear-wheel mode can significantly improve fuel efficiency and reduce strain on essential systems. These vehicles tend to come with a higher price tag, and four-wheel drive systems are costly to repair. It's also worth noting that during heavy rain or snowfall, blocked sensors may lead to delays in system response.

The Tractor Revolution

At one point, farmers and growers used horses, oxen and mules to assist in planting and harvesting. Then the tractor came along.

This innovation led to significant growth in both production and the physical size of farms. The average amount of land farmed has now ballooned to around 450 acres, according to the U.S. Department of Agriculture. Here's how the tractor revolution unfolded.

A SHIFT IN APPROACH

In 1920, there were more than 25 million horses and mules in the U.S. and most of these animals were used on farms, primarily for pulling wagons and bringing in the harvest. During that same decade, tractors began to become more prevalent. This allowed farmers to more efficiently manage heavy loads, till the soil, and harvest crops without an animal being burdened by fatigue. Tractors also lasted longer than an aging herd of helpers.

As the use of tractors grew, vast areas previously devoted to growing oats for animal feed were also repurposed. This shift enabled farmers to cultivate more valuable crops, and it significantly increased food production for larger



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populations in less time.

EVOLVING TECHNOLOGY

Tractors may all seem the same, but there have been huge innovations. In 1996, John Deere partnered with NASA to develop the first GPS technology specifically for tractors. Within a quarter of a century, the majority of North America's growers were using

these advanced systems. As with passenger vehicles, the integration of microchips eventually became essential in tractor construction and functionality. That led to significant complications when the production of these semi-conductors faced delays because of pandemic-related supply chain disruptions. The so-called "chipageddon" issue

actually persisted into 2022.

PROS AND CONS

Some farmers choose to cut their annual budget by leasing a tractor rather than purchasing it outright. There are distinct advantages with either option. Owning equipment can include tax incentives, and owners often gain a deep understanding of their specific machinery.

Leasing may be more suitable for those who only temporarily require a tractor, anyone struggling to come up with the upfront expense, and those who are nearing the end of their days as a farmer. Leasing could also be helpful in regards to avoiding unexpected repair costs as leased tractors are typically newer and covered by manufacturer warranty.

Explore More with an ATV

All-terrain vehicles are perfect for outdoor enthusiasts who enjoy activities such as hiking and climbing. Hunters also love them for their versatility. But that's not all people are using ATVs for these days.

WORK OR LEISURE

At the heart of their appeal, ATVs have always offered a sense of adventure and freedom. They allow you to venture far from well-trodden paths while immersing yourself in the world around you. The open cab design only adds to the thrill of driving. But ATVs are not just used for leisure anymore. Farmers, ranchers, construction workers, security personnel and maintenance workers increasingly rely on them for work tasks. Their robust build and storage capabilities make ATVs indispensable for anyone who frequently works in an outdoor environment.

STRENGTH AND ACCESSIBILITY

ATVs provide access to areas that other vehicles simply can't reach. They will take you to locations far removed from cars or even many trucks. That's particularly helpful for drivers taking off-road paths to secluded spots--or sometimes, taking a



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journey with no path at all. These vehicles are built to handle those very tough conditions, with powerful engines and resilient frames that can endure rough weather and bumpy landscapes. With regular maintenance and appropriate care, ATVs can provide years of reliable service. Like so many of today's

vehicles, ATVs also come with a variety of customization options to cater to anyone's personal needs or tastes, including performance enhancements, unique paint jobs and special accessories.

START MAKING MEMORIES

Spending time on ATVs with

family and friends is an excellent way to make great new long-lasting memories. It's an opportunity to take a break from everyday life and indulge a passion for the great outdoors.

You're creating once-in-a-lifetime experiences because ATVs help us explore areas where traditional vehicles

could never go. Just remember to do plenty of research before making a decision, so the new ATV checks every one of your boxes.

Once you're out there, be mindful of where you drive to avoid bothering animals or fellow travelers and to minimize damage to the natural surroundings.