

passing restive horses. A further application of the foot-pedal applies the differential brake. It was a standard vehicle of this model that outdistanced its competitors of the same class in the New York-Buffalo Endurance Trial, being the only light gasoline vehicle to win a first-class certificate on an average of 12 to 15 miles an hour over mud roads for five consecutive days.

The makers of the autocar claim that it cannot blow up or burn down, and after an examination of its distinctly automatic features it must be confessed that the claim appears to be well founded. The interchangeability of the parts is another noteworthy feature of this car, which has quite a military air, mainly suggested by its wooden wheels of the artillery type. The equipment consists of a balanced double-cylinder gasoline motor of  $8\frac{1}{2}$  horse power, the cranks and moving parts being inclosed in an aluminium case, excluding all dust and facilitating the utmost ease of lubrication. The transmission gear, also inclosed in aluminium casing, provides for a range from 8 to 21 miles per hour ahead, and a slow reverse covering all the requirements from a level to steep hills. Six gallons of gasoline, sufficient for 100 miles' touring, are carried under the forward hood. The control of the vehicle is effected by two levers, one operating the clutch and throttle valve; the other for gear changing.

The Haynes-Apperson vehicles, which made such a fine record for themselves in the New York-Buffalo Endurance Run, are probably the handiest and most reliable small-size, high-power automobiles as yet produced in this country. The new 9-horse power surrey recently completed by the firm was on exhibition. It disclosed many improvements, notably in a more direct transmission gearing, a better method of lubrication, a water circulation by radiator and pump, and a new model of steel rims. The makers, who have the benefit of eight years' experience in the automobile industry, are still retaining their well-known double-cylinder engine of the horizontal opposed-cylinder design with but few alterations, and all the vehicles have forward speeds of 6, 12 and 25 miles per hour.

The electric truck for carrying and hoisting safes by its own motive power, exhibited by the Hall's Safe Company showed by actual hoisting tests of many safes that it was good for the claims made in favor of it by its makers, the Vehicle Equipment Company, of Brooklyn, N. Y. This truck has been in the market but a very short time. It is able to transport several safes at a fair rate of speed and hoist them into the loftiest sky-scraper extant in less time and with less expenditure than by means of the ordinary hand truck.

The biggest machine produced in America is the 3,300-pound gasmobile, the ponderous and resplendent appearance of which has fascinated those automobile visitors, who love a big machine and high speed. This leviathan of the "teuf-teuf" family relies for its power on a 6-cylinder engine capable of 35 horse power—an unusually large amount of power for a touring vehicle of such dimensions.

#### Pearl Fisheries of Venezuela.

The pearl fisheries of the island of Margarita, on the coast of Venezuela, have become quite important within recent years, and are now extensively worked. The pearls of Margarita Island have been known ever since the discovery of the country. The Indians of the time of Columbus were already provided with ornamental objects in which pearls figured prominently, and it seems to have been these pearls which occasioned the first difficulties between the Spaniards and the inhabitants. During the last few years the oyster beds of the island have been more and more actively worked. At present there are about 400 sail boats with native equipments working about the islands of Margarita, Coche and Cubagna. The principal oyster beds are those of El Tirano, to the northeast, and Macanao, to the northwest of Margarita. It is estimated that at present as many as 2,000 men are occupied in the oyster fisheries. Metallic drags are used, which are drawn over the oyster beds. The boats have a tonnage of 3 to 15, and pay a tax of \$3 a year to Venezuela. The pearls are of a fine quality, generally white or yellow. Sometimes a black pearl is found, but this is rare, and it brings a high price. Not long ago a white pearl was sold for nearly \$2,000. The shell of the pearl oyster is not of any great value, as it is too thin to be utilized. The Margarita oyster has a relatively short life and on an average it does not exceed eight years. A French company has been lately formed for the pearl fishery. It will operate, not by using drags, but by divers, with and without suits. In this way the smaller oysters will be spared, and the beds will not be depopulated. The value of the annual production of the Margarita Island region is over \$600,000. Most of the pearls are sold in the Paris market, where the sale appears to be the most active and the best prices are obtained.

On a dining car of the New York Central recently, 318 dinners were served without re-stocking the car.

#### THE WHEEL WITHIN WHEEL.

The inventor of this innovation in automobile construction has attacked the tire problem in a novel manner by placing the pneumatic tire where it will not need to come in contact with the roadbed, yet in such a position that its full cushioning effect will be obtained. "The Wheel Within Wheel," as its name denotes, consists in reality of two separate wheels on two separate hubs, one within the other. The rim of the smaller or inner wheel is bound to the outside flanges of the hub proper (which flanges form the outer of the two hubs) by wire spokes, while that of the outside wheel is rigidly held in place by large metal spokes radiating from the center or inner hub. The hole of this hub is somewhat larger than the axle, and the hub has no bearing surface on the axle. The hub is narrow and is, in reality, a sort of flange with a groove running across its face. (a, Fig. 3.)

The outer flanges of the hub proper, that is, the flanges forming the hub of the smaller wheel, have each a groove across their inner faces. The floating guide-ring (b, Fig. 3) has two lugs on each face, the line of the two lugs on one side being at right angles with the line of the two lugs on the other. Two of

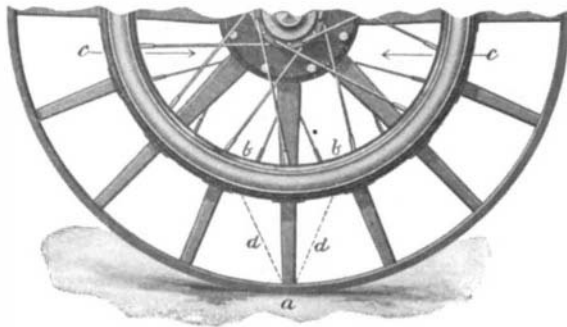


Fig. 1.—Side Elevation of Half of Wheel.

these floating plates make the driving connection between the outer hubs and the inner one, and, as the lugs slip loosely in the grooves of the side and center hubs, the latter can slide on each other either vertically or horizontally at the same time.

The rim of the smaller wheel is made double, and two pneumatic tires are mounted thereon,

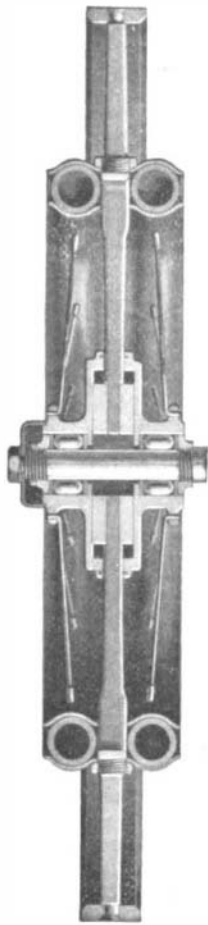


Fig. 2.—Section Through Wheel Center.

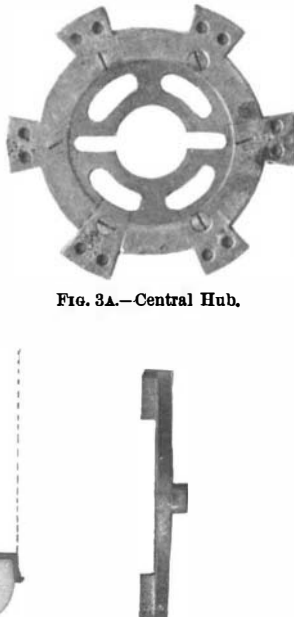


Fig. 3A.—Central Hub.



Fig. 3B.—Side Elevation of Floating Guide Plate.

#### THE WHEEL WITHIN WHEEL.

one on each side of the spokes of the large wheel. Two bearing rims attached to these spokes bear on the tires and cushion the large wheel on the small one. As the tires are double, and as the bearing surface on them is on about half their circumference, instead of at a single point, they need not be inflated as hard as usual, and so give a much greater cushioning effect. A wheel with 15 pounds air pressure in the tubes will carry 500 pounds weight at least. The wheel has been tested by several manufacturers, who expressed themselves favorably as to its merits. A gasmobile exhibited at the recent Automobile Show was equipped with a set of these wheels.

#### Demand for Electric Plant in Greece.

Consul McGinley reports from Athens, September 12, 1901, that the Mayor of Kerpenesion, a village in the Province of Evrytania, wishes to have that place lighted by electricity, and has requested the consulate to publish the fact in the United States, hoping to induce some American company to sell him a suitable plant. There is a stream near the village that can be utilized to furnish the necessary power for the plant.

There are 400 houses in the village, and the Mayor estimates that about that number of incandescent lights will be required. He does not mention the number of arc lights required. Kerpenesion is the village which the heroic Greek chieftain, Marco Bozaris, was defending when, in 1823, he fell in a midnight sortie against the Turks, an event made famous by Fitz Greene Halleck's stirring poem.

#### Electrical Notes.

Consul Berliner reports from Teneriffe, October 4, 1901: For some time the direct cable between Teneriffe and Europe has been broken; also the cables connecting the different islands. All the islands are now cut off from the outside world, except Teneriffe, which has cable connection with Bathurst, Africa. The charges from Teneriffe to New York, formerly 2s. (49 cents) per word, are via Bathurst 6s. (\$1.46) per word.

The tramways of Paris and its suburbs are in the hands of 11 companies working 53 lines, with 832 cars for mechanical and 297 for horse power. The following systems are used: (a) For electric traction—trolley, 1 line; plow, 5 lines; system Diatto, 12 lines; system Claret et Vuilleumier, 1 line; accumulator, 19 lines. (b) Compressed air, 9 lines. (c) Steam, 5 lines. (d) Rope, 1 line. The trolley system is not allowed within the city, and has only been granted provisionally to one line, Bastille-Charenton.

It has been necessary to tear out an expensive marble switchboard which was built in the electrical power house at "Idle Hour," Mr. W. K. Vanderbilt's estate in Oakdale, L. I. Ever since the marble board was put in the current has been erratic, says The Electrical Review. It was finally determined that the trouble must be in the switchboard. A careful investigation revealed the fact that the marble contained a vein of iron sufficiently well developed to form an occasional short-circuit. A new switchboard is to be constructed and the old one torn out.

The Electrician states that a proposal has been submitted to the municipal authorities at Rouen, by the chief of the fire department, for the utilization of the tramway trolley wires in connection with the extinguishing of fires. All the principal thoroughfares of the town are provided with electric tramways, and the proposal is that pumps capable of being electrically driven should be installed in a number of suitable positions on the tramway route, to be switched on to the trolley wires, so that the pumps may be used as occasion necessitates. The proposal is said to have been favorably received, and is now under the consideration of the authorities.

The enormous strides that have attended the development of telegraphy during the nineteenth century are strikingly illustrated by some statistics recently issued by Sir W. H. Preece, K. C. B., late electrician to the English Post Office. In 1870 the number of words transmitted per minute was only 80; in 1890 the number had been increased to 450. In 1870, 9,850,177 messages were dispatched throughout the United Kingdom, at a cost of \$3,061,505, while in 1900, 89,576,961 telegrams were sent, bringing in a revenue of \$17,296,765. The total number of government and private cables encircling the globe is at present 1624, covering a total length of 187,353,172 nautical miles.

It has now been practically settled that the Colorado and Southern Railroad will install electricity as a motive power on all its suburban lines running out of Denver. During the summer an expert was sent to Europe to investigate the various electric systems in use in Berlin and other cities, and to report on the advisability of adopting any of them. This expert has recently returned, and reports that the change to electricity is entirely feasible and will not involve a cost which this recently reorganized system would not be able to sustain. It is expected that the recommendations which he will submit will be acted upon definitely within a very short time. The suburban lines on which this change is to be made are five in number, entering Denver from different directions. The road also contemplates changing its locomotive fuel from coal to oil.

It is intended to utilize electricity in lieu of steam for subsidiary purposes upon the vessels of the English navy more extensively than at present. A series of prolonged experiments are to be made to ascertain the range of the practicability of using this power for this purpose. At present the capstan, steering engines, ventilating fans and derrick hoists on the vessels are manipulated by steam, necessitating the construction of a bewildering network of pipes in the interior of the ship. The new armored cruiser "Hogue" is being fitted with electric wires, and the entire subsidiary gear will be controlled by electricity. Should the experiment prove successful, the system will be extended to all other vessels refitting, as well as those under construction. A modern English battleship now carries a small staff of electrical engineers, so that no alterations will have to be made respecting the crew.