USE OF HARDWOODS IN AUTOMOBILES.

The construction of automobiles is of interest to lumbermen—only with regard to the bodies and wheels, however, as the rest of the gear is of metal in practically every case. From the construction point of view the automobile is a combination of carriage and locomotive engine, whether the propelling power be gasoline, electricity or steam. At first the automobile was used only for pleasure, and the body and wheels of such vehicles follow the general characteristics of carriage construction, but the entry of the autotruck into commerce has necessitated the use of the heavier woods that belong to wagon building.

As the wagon and the carriage have already been treated in this series of articles it remains only to consider aspects of automobile body and wheel building that are more or less peculiar to this form of vehicle. Automobiles have not yet reached the variety in construction and employment of the horse-drawn vehicle, but, as is well-known, its manufacturers and friends look forward to a time when it will have wholly superseded the horse. In the carriage line it has been applied to most forms except the hearse, and it will probably be a long time before undertakers will adopt it, for the spectacle of a motor breaking down, or the chassis getting out of gear, would not conduce to maintaining the ceremonial gravity of proceedings; the "chug, chug," and the odor of gasoline would be other disagreeable features of the "autc-hearse;" and long-hallowed custom is always a serious obstacle for the progressive man to buck against, especially when religion stands back of the custom. Yet it is known that some automobile men are figuring upon this very thing, so that the "autohearse" may eventually become a reality.

The automobile has already been applied to the uses of the retail delivery wagon and the large delivery truck, and in the form of a three-wheeled motorcycle has brought into being a new type in the shape of the little delivery auto, which has proved very useful, but which in its common form contains little or no wood.

When one hears the word "automobile" the picture that comes into one's mind is a pleasure car, as it is in this field of vehicle employment that the horseless wagon has thus far attained its chief development, and even here the auto has by no means ceased to be regarded as a curiosity. In the carriage auto, as in its horse-drawn prototype, lightness is sought, in so far at least as it is consistent with strength. The bodies are usually made with ash framework and poplar panels, as in carriage construction, but pressed steel and aluminum panels are said to be growing in favor. Roofs for limousines and other roofed autos of the pleasure type are often made of wood in the three layers, the under side being mahogany and the two upper poplar. Mahogany, and sometimes birch, are used for window frames in limousines and for trimmings. Wooden wheel rims, when used in the steering gear, are generally of a single piece of maple bent to a perfect circle.

Most carriage autos have wooden wheels with metal hubs. The wood employed is almost always hickory, though ash is said to be sometimes substituted. Auto wheels must be solid, and therefore the spokes and rims make up in thickness what they lack in other dimensions. Oak, the wood universally utilized for spokes and generally for rims in heavy wagons, is never used, as hickory possesses an obvious advantage in standing the heavy jolts which the auto is constantly receiving. The wheels are often "dished," but the practice is not universal among automobile makers, for reasons which it is not necessary to enter into here. Automobile wheels are of the same size front and back, as the mode of steering is different from that which is universal in wagon and carriage building, and also because the method is thought to secure better distribution of load. Racing cars often have solid disks for wheels, which in such cases are of metal. The object of this is to avoid "windage" or the effect of wind upon the spokes, which is said to sericusly retard the speed of the car. Wire wheels were formerly used for autos of all descriptions, but these have been practically abandoned.

Motor frames are sometimes of wood with iron armor, but the use of wood in any form is the exception.

The automobile industry as a market for hardwoods is a product of the last few years, though private vehicles driven by steam and other means are of much older origin. So far as we know they were first thought of by the monk and scholar Roger Baccn, who lived in the thirteenth century, and is not to be confounded with Sir Francis of the same surname, who was a contemporary of William Shakespeare. Bacon foresaw the time when we would be able to "propel carriages with incredible speed without the assistance of any animal."

Sleighs and sleds vary in construction and material according to their uses. Sleighs derive their construction from the carriage. Hickory is the gear material and the runners should be bent hickory. Bedies generally have ash framework and poplar panels, except that dashboards are frequently made of basswood, which is preferred by some high-grade makers because it submits more readily to the bending process than does peplar, and sleigh dashboards are generally handsomely bent in graceful curves. Red gum is also much used for bodies.

Farm and mountain bob and delivery sleds are made of heavier material. The runners are of oak, bent or sawed, just as in heavy wheeled vehicles the wheels are more likely to be cf oak than anything else. Other gear parts are generally of rock elm and maple. The box may be a wagon box temporarily shifted from the wagon gear for the season, or a lighter box cf the delivery type, and often, as in logging operations, no box whatever is needed.

Lumber enters more largely into the construction of the modern bicycle than the average man realizes, although steel and iron are the chief materials in it, as they represent a combination of great lightness and strength that wood does not possess. If the history of cycle-making had followed the lead given by the first maker bicycles would be all-wood v-hicles to-day; for the pioneer bicycle, made early in the nineteenth century, was entirely of wood. It was an extremely crude affair, propelled by the rider pushing his feet against the ground.

All-wood bicycles have not been manufactured much the past few years, but a cyclc called the "Hickory," with framework and wheels of that sturdy timber, was made not so very long ago by the Hickory Bicycle Company, a concern practically owned by the Pope Manufacturing Company, whose position in the cycle business is well known. Handle bars are still made of bent hickory, and of bent maple also, though steel is by far a more common material. Hickory is also sometimes used for the wheel-rims, but the favorite wood is maple, with elm as second choice. Ninety-five per cent. of the cycle wheelrims made are of wood. Until recently the proportion was even greater-ninety-nine per cent.-but there is now a tendency toward more extensive use of steel. The objection to hickory as a wood for wheel rims is that it warps more readily than maple or rock elm. Handles, or "grips," to employ the trade name, are usually of maple wood, with steel core and leather covering. Cork grips, once popular, are no longer used. Saddles in high-grade vehicles are of laminated wood covered with hair and leather.