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Any Wood Carefully Dried Will Withstand Warping

Not Natural for Particular Types of Lumber to Warp, According to Expert. Responsiveness May Vary, but Care Will Do the Work. Under Proper Conditions All Lumber is O.K.

Because this country is a producer as well as a material user of lumber, people should naturally be specially interested in the following article by R. S. Homer in The Canada Lumberman:—

"Why does lumber warp? Is it just natural for some woods to warp and twist and for others to stay flat and straight? One often hears the expression, 'Don't use such and such a wood as it will not stay put.' Does the fault lie in the wood itself or are there other contributing causes.

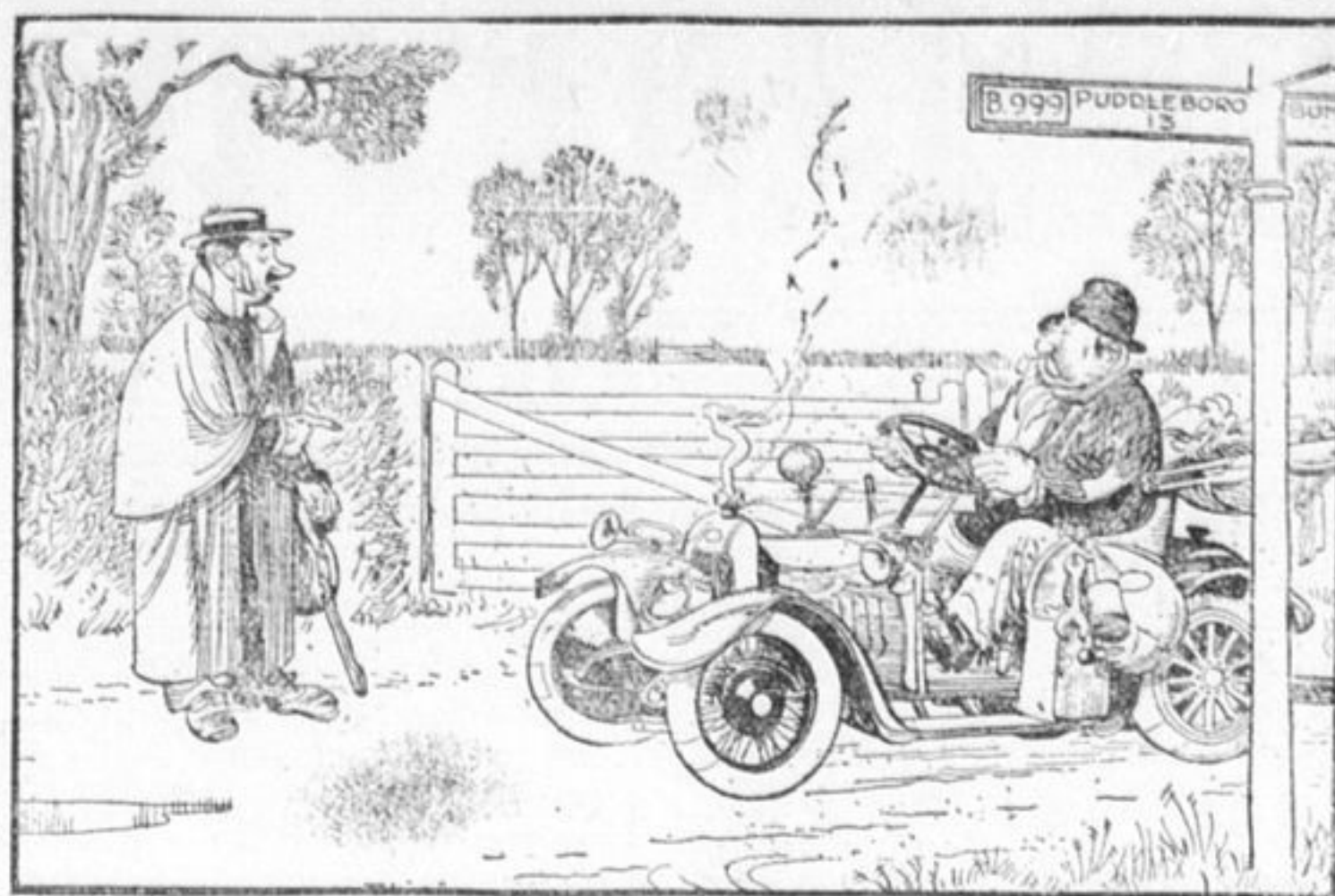
"The instability of wood has been a source of trouble ever since this material was first used. Wood fibre is

hygroscopic. It has a strong affinity for moisture, picking it up from the air on every occasion. Further, it shrinks as its moisture content is removed and swells as more moisture is absorbed. This latter feature, coupled with an unequal distribution of fibre throughout all wood, is at the bottom of all moving and warping.

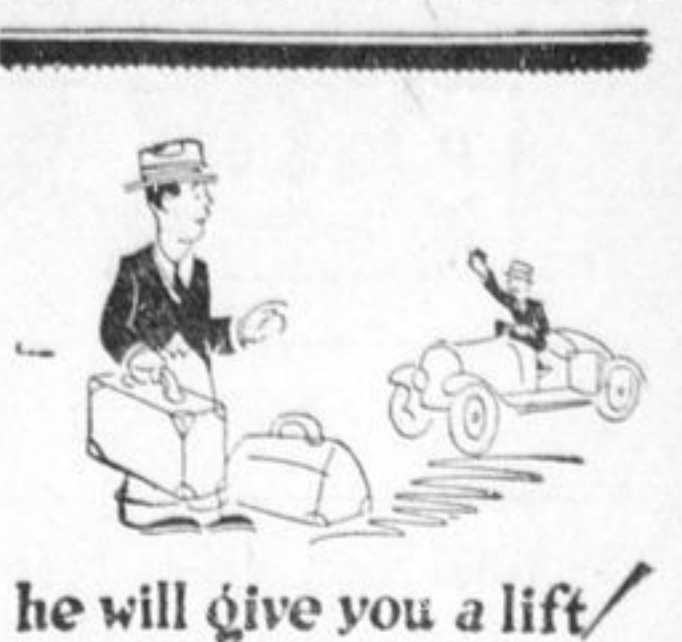
"Now some woods react to a greater degree than others. For instance, white elm shrinks approximately ten percent in width from green to oven dry, while mahogany shrinks only five percent. It follows then that the reaction of elm to changes in moisture is much greater than that of mahogany. It is not that elm is hard to dry, or that it is more 'lively,' as is sometimes stated, but simply that the fibres react nearly twice as much for any given change in moisture content. Chestnut is looked upon as a fairly stable wood. The tangential shrinkage from green to oven dry is given as six decimal seven percent. Thus the reaction of chestnut to any given change in moisture is considerably less than that of elm.

"Formerly there existed considerable misconception on this point. A wood that gave trouble after being thoroughly dried was said to be a 'live' wood while a wood which did not work so much was said to be 'dead.' The removal of saps and gums was often thought to be at the bottom of a lot of trouble. If these substances were left in the wood it was thought to be more responsive to moisture changes. However, we know better today. We know that a wood reacts largely in the degree to which it shrinks from green to oven dry. This shrinkage is practically uniform from fibre saturation point to dry, so the degree of movement is in direct proportion to the change in moisture content. We also know that very little can be done in kiln drying to remove saps and gums, only the surface pores and fibres being effected, and that it does not make the slightest bit of difference as far as the subsequent action of the wood is concerned, whether or not such substances are removed or left in the wood. In other words, the presence or absence of gums, resins, sugars, etc., in wood, has not the slightest effect on its responsiveness to moisture changes and therefore this feature need not be given the slightest consideration.

"Now wood shrinks as moisture is being given up and swells as it is being absorbed. If this movement is uniform throughout a piece it will not be accompanied by warping or cupping, that is unless there are certain strains, set up during previous drying, which may be released by changes in moisture content and which may be



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Second Tramp: "Made it out o' odd bits I picked up during twenty years on the road."
—The Passing Show.



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aircraft manufacturers look to Canada as the most important market in the world. With its great open spaces, transportation was a more vital problem here than elsewhere. Its climate its busy commerce and its natural adaptability to air craft make it an ideal place for the advancement of aviation.

The "Moth," which had become a household word in Great Britain, and was well-known to all airmen, was already used extensively by the Ontario Government, Dominion Airways Ltd., and other companies. It was cheaper than machines of United States manufacture of the same kind, even including tariffs, etc.

The machines were quite cheap, and easy to operate, the airman said, and it had been estimated that the cost of using a small airplane privately is not greater than that of maintaining and using a 20 horsepower automobile.

Regarding the proposed assembling plant for Canada, Capt. St. Barbe said, the de Havilland people felt it would be preferable to unite with Canadian interests in this respect, and the resulting corporation would be an Anglo-Canadian concern.

If interest in aviation increased at the rate indicated by requests for information regarding flying clubs pouring into the officers of the Air Force, it was probable that a manufacturing and distributing plant, which would serve all Canada and possible trade in the United States, would be erected at either Montreal or Ottawa.

Capt. St. Barbe was unable to estimate, at such an early stage of progress in the company's plans, how many employees such a preliminary assembling plant would require, but stated that a new building would undoubtedly be erected for the proposed depot.

SNEAK THIEF TOOK CHAINS FROM TRUCK IN GARAGE.

"F. D. Leslie, Browning street, is mourning the loss of a good set of auto chains which were taken from his truck while the vehicle stood in the garage near his home. He had just secured the chains one day last week and had planned a trip the following day. He had the truck all ready, with the new chains fitted on and securely fastened, as he thought, and intended to start out the next morning. The truck was in the garage, which was not locked, as Mr. Leslie had no thought of any sneak thieves. However, the next morning the chains were gone, although nothing else had been disturbed. No trace of the thief has been discovered."

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Everybody Welcome

TO ESTABLISH AIRPLANE DEPOT IN CANADA SOON

Assembling and Service Plant to be Built and Operated at Montreal or Ottawa to Care for Special Demand

In view of the plans now under way for a Porcupine Air Club, there is very general interest in air service matters, and all will give special attention to the announcement made last week at Ottawa that an airplane assembling and service depot will be established in the very near future at either Montreal or Ottawa. The announcement was made at Ottawa by Capt. F. E. N. St. Barbe, who said that the depot would comprise a big manufacturing and distribution plant for the whole North American continent. Capt. St. Barbe is the business manager of the de Havilland Aircraft Co. Limited, of Great Britain. He was a visitor to the Royal Canadian Air Force at Ottawa. His visit to Canada is principally to discuss with the authorities the extension of the use of the famous "Moth" planes which are manufactured by the de Havilland Co., and also to talk air service ideas to all interested in the formation of the flying clubs springing up all over Canada in the important centres. It was a club of this sort that was considered and discussed at the recent meeting in Timmins referred to a couple of weeks ago in The Advance.

In an interview given out at Ottawa last week, Capt. St. Barbe mentioned incidentally that the Canadian Government had on order a total of 24 Moth planes, 10 of which were for the civic aviator clubs, and 14 for survey and photographic work of the Civil Aviation branch. It may be noted incidentally here that the Ontario Government has several of the Moth planes, these being used in this province particularly for the work of the Forestry Department, while this type of machine is also in demand for the work of transportation to new mining fields, and for survey work in connection with mining areas. Capt. St. Barbe declared British

place to suggest that at times certain stock is blamed, when neither the wood nor its condition is at fault. Often, in the plant, the stock in process will be exposed to unusually severe conditions, either too dry or too moist. Under such conditions, moisture is either picked up or given off. Trouble may occur as this change is taking place or as the condition of the stock resumes its normal moisture content. In either event, the original condition of the stock had nothing to do with subsequent trouble, the latter being due entirely to improper factory conditions. It is surprising the number of plants in which severe conditions of this nature exist in certain departments or sections. Correcting this situation as found or storing the stock in some other section will tend to reduce trouble from warping or moving as the stock is being machined and assembled. Sometimes, unnecessarily severe conditions in the varnish drying kiln is at the bottom of trouble frequently encountered during or after finishing.

"Any wood carefully dried to a moisture content which corresponds to the average E.M.C. of the conditions to which it will be exposed, should be reasonably stable. If trouble is encountered there must be some extraneous cause which should be corrected, bearing in mind that some woods react to a greater degree than others to changes in moisture content."

sufficient to cause warping and twisting. With this exception, warping and similar troubles are caused by uneven moisture distribution, uneven drying, such as when only one face is exposed, and uneven fibre distribution resulting in more movement where the fibres are densest.

"Some of these factors can be controlled and some cannot. If surrounding atmospheric conditions were stable our troubles would be over, for the stock could then be dried until the moisture content would be in equilibrium with these stable atmospheric conditions and then as there would be no further changes in moisture content there would be no tendency to shrink, swell, warp or twist. In other words any wood, under practically any condition is stable as long as its moisture content remains constant. It is as the moisture content changes that most trouble is encountered.

"Unfortunately atmospheric conditions are constantly changing. The humidity is high one day and low the next. It is high during the summer and relatively lower during the winter. This latter condition is aggravated by the heat used in our homes and factories during the latter season, still further reducing the already low relative humidity. Thus we find that in addition to slight fluctuations almost from day to day, wood, particularly that used in heated buildings, takes on moisture and expands during the warm months when the humidity is high and gives off moisture and shrinks during the winter season. This goes on year after year, with little if any change. Protective coatings, such as paint and varnish help some, though they are only moisture resistant, not moisture proof but the trouble is that such coatings are seldom applied so that all sides of the work are equally protected. A table top may have three coats of varnish on the top surface and only a coat of stain on the under side. Under such conditions there is bound to be a tendency to warp because the moisture enters more freely from the under side, causing unequal expansion.

"Now the science of moisture control is that because wood is stable as long as its moisture content remains constant, the solution is to dry it to the point where the moisture content comes into equilibrium with the E.M.C. of surrounding atmospheric conditions. This is fine, but the weak point is that these conditions are not stable so that about all that can be done in this respect is to dry to the average E.M.C. of the conditions to which the work will likely be exposed.

"As yet, there is no practical way of preventing or controlling the movement of wood. It is possible that chemical or impregnating treatments may prove the solution. All that can be hoped today is to give close attention to drying so as to secure uniform moisture distribution at the desired moisture content and a freedom from uneven stresses and strains. Finishing plays a part, too, as already outlined.

"In closing, it might not be out of

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a LIGHT on your horse-drawn vehicle at night may SAVE YOUR LIFE!

Horse-drawn vehicles (as well as motor vehicles) on the highway at night now MUST display a light. This new law is designed to prevent accident to occupants of horse-drawn vehicles as well as of motor cars.

You will provide for your own safety by obeying this law. Drivers of fast-moving vehicles have become accustomed to looking for lights on ALL vehicles at night. The danger of accident to horse-drawn vehicles without lights therefore is greater now than it was when lights were not compulsory. At this season, when nights are darker and longer, the hazard is increased.

The light on a horse-drawn vehicle must be placed on the left side in a conspicuous position. It must show white to the front and red to the rear. It must be clearly visible at a distance of at least 200 feet. Where vehicles carry inflammable materials or are structurally unsuitable for carrying lighted lamps the Department, by regulation, may permit the use of a reflector instead of a lamp.

\$5.00 Fine

The penalty for failure to observe this law is a fine of \$5.00. Motor traffic officers or city or town police will apprehend all who fail to comply.

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The HON. GEO. S. HENRY, Minister

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