

# TECHNICAL NOTES

FOREST PRODUCTS LABORATORY

U. S. FOREST SERVICE

MADISON, WISCONSIN

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## METAL STRAPPING ON WOODEN BOXES

One of the quickest and cheapest methods of adding to the strength of a wooden box is to wrap it with thin, flat metal straps. The ability of a box to withstand the hazards of transportation may thus be increased several hundred per cent.

Tests made at the Forest Products Laboratory for the War Department have provided some information as to how a box should be strapped to add most to its durability.

The best place to apply the strap is apparently about  $1/4$  of the length of the box from the end. The strapping is preferably nailed at each edge of the box to hold it in place, having, of course, been drawn snug by special tools for that purpose.

Nailing the strap in place works well on boxes made of lumber  $1/2$  inch or more in thickness, but cannot be successfully used on thinner material because the nail splits the board. On thin boxes it is necessary to join the two ends of the strap (for which purpose there are several devices), thus making a metal band around the box held in place by tension.

Depending on tension alone to keep the strap in place is, however, open to one serious objection. Unless the box is constructed of dry lumber, shrinkage reduces its circumference to such an extent that the metal strap is no longer tight. This action not only reduces the effectiveness of the strap, but commonly permits it to slip over the end of the box. A shrinkage in moisture content of 10 per cent will permit the straps to fall off when the boxes are subjected to the ordinary hazards of transportation. A shrinkage of 5 per cent will loosen the straps considerably, but rarely enough to permit them to fall off.

The effect of shrinkage of the box is also serious when the straps are nailed at any point, since it causes them to buckle or "festoona". The reinforcing effect of the straps is thus diminished and the box becomes dangerous to handle. It is important, therefore, that metal strapped boxes which are to be in transit or storage for any length of time should be built of dry lumber.