

Aerial view of Wilmington Boat Works shows wooden ships under construction, laminated sections drying

Gone are the great oak-timbered ships like the famed *Constitution*. The biggest piece of oak in our newest mine sweeper is only 16 feet long and less than an inch thick! Now they build

SHIPS OF WOODEN 'SANDWICHES'

STANDING AMIDSHIPS on the deck of the two-thirds completed *Implicit*, the assistant hull superintendent looked down into the hold. On his sunburned face was a look of mingled awe and satisfaction.

"I've been a ship carpenter for 27 years,"

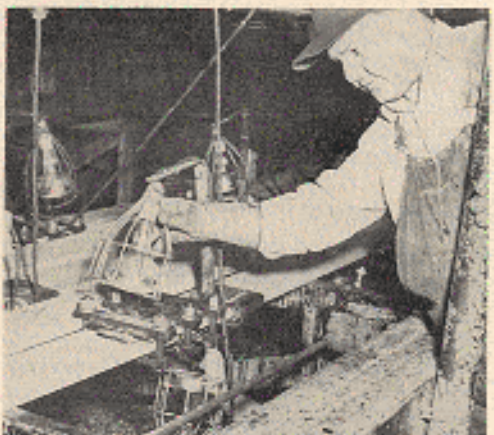
Foreman inspects short pieces of lumber with ends tapered so they may be joined into longer lengths

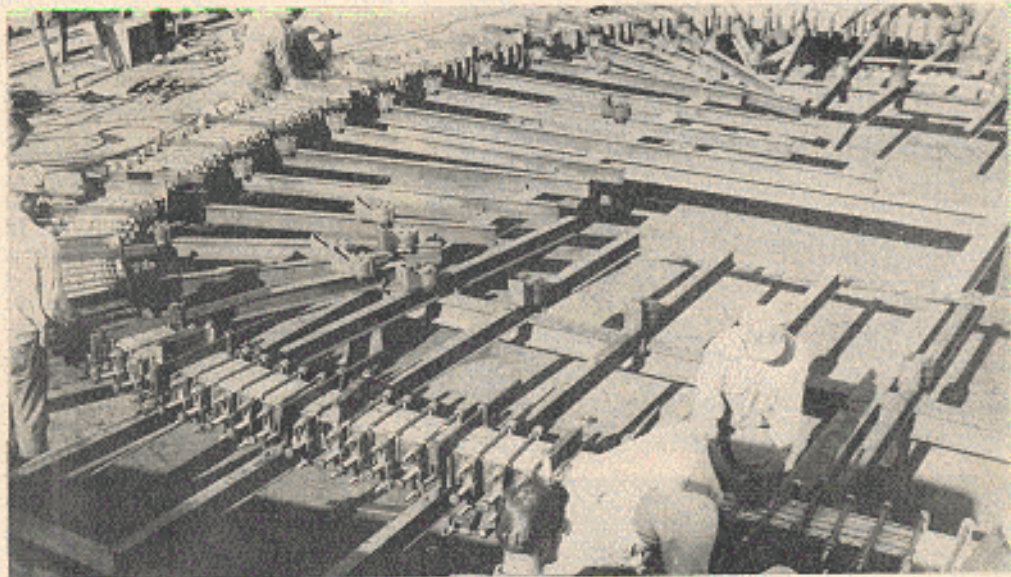


By Bob Ruskoff said Frank Argento, "but I've never seen anything just like this. The biggest piece of oak that went into this ship, mind you, was only sixteen feet long and $\frac{3}{8}$ of an inch thick. Two years ago I wouldn't have believed it possible."

Made for mine sweeping, the 171-foot *Im-*

Pieces are glued together and dried by heat lamps placed above and below joints held in pressure clamps





After planing and finishing, the pieced-together lengths are glued into sections bent to shape on big metal jigs

PLICIT was being constructed of laminated woods to an exact and completely new Navy formula. Like her duplicates under construction in 14 yards about the country, she has been called "the finest wooden ship the Navy ever built."

Bob Carlson, president of the Wilmington Boat Works at Los Angeles Harbor where the *Implicit* and seven sister sweeps are now under construction, tells why the "sandwich" ships surpass even the magnificent timbered ships of old.

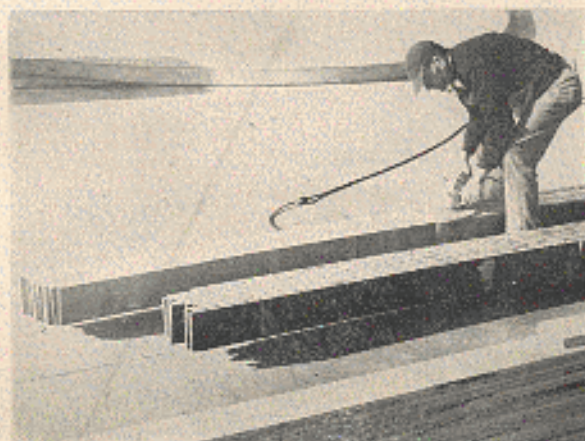
"It has been found almost impossible to cure large timbers completely—so, they eventually will rot in water. It is better to build up thoroughly dried and cured small pieces. Because of our improved techniques of gluing and curing—many developed within the last two years—we can produce far stronger vessels than were ever built of solid woods."

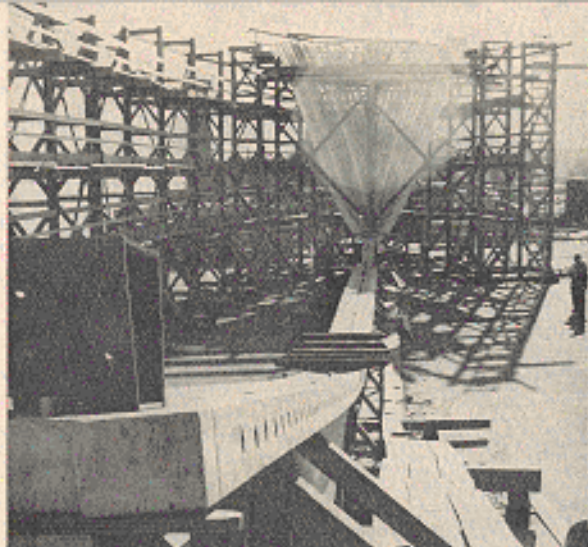
Because this formula has uncovered amazing potentials in laminated-wood construction, many maritime experts envision a return to the era of wooden ships. Great windjammers under canvas? A few, perhaps. But more likely, cargo vessels powered by diesel.

Not even those engaged in the laminating of these woods, however, profess to understand fully the peculiar alchemy by which



Sections are nut-clamped at specific pressure in the jig. Steam blower mounted in mobile structure on tracks is rolled over jig to "cook" sections. Below, cured section is sanded





Ship starts to "come alive" as laminated keel is laid and building of hull begins

the wood achieves a nigh-unbelievable, ironlike hardness and strength.

The tensile strength of a laminated-oak frame, for instance, has proved nearly twice that of a cured oak timber of equal dimensions. In resiliency, the laminated pieces surpass steel.

Primarily, the wood used in building the staunch minesweepers is oak, although fir is used in the deck construction as well as in some of the beams.

When the oak and fir pieces come into the yard they are carefully inspected for such weaknesses as knots, honeycombing and sap. The first main step in the process consists of tapering the ends of each board so it may be combined with others into longer lengths. In the *Implicit*, these lengths, or laminars, are 61½ feet long, this being the length of the vessel's ribs.

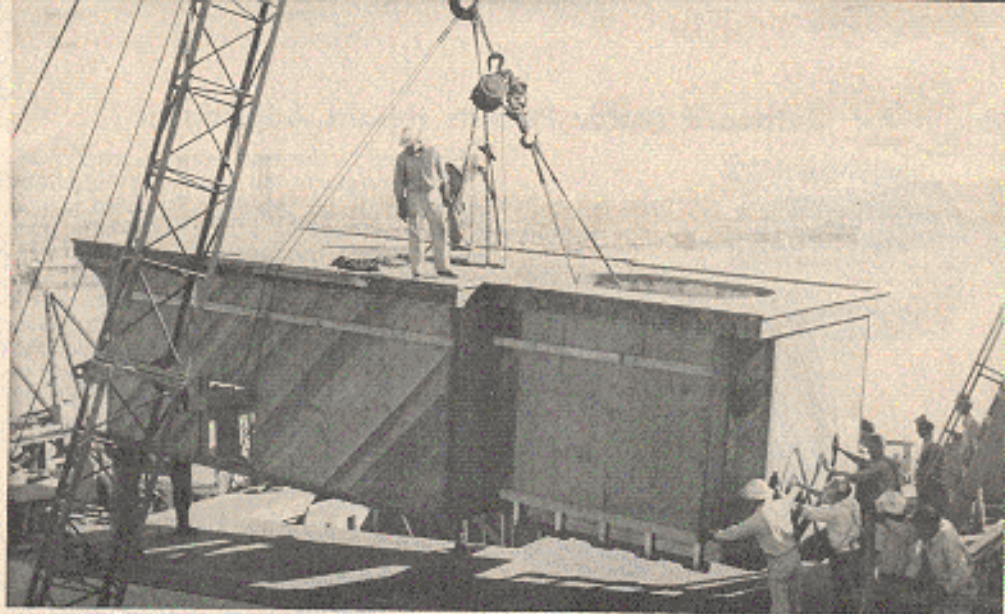
Glued and pressed by nut clamps under 30 pounds of pressure, the laminar is dried on a long table under a battery of heat lamps for half an hour.

The next step carries the lami-



Preassembled transom is fitted to stern. Below, construction scene inside hull as wooden mine sweeper moves to completion





The after deckhouse, also built of laminated pieces, is carefully swung into position on deck of new ship

nars, in turn built up into sections, to a big metal jig on which they are molded to a specified shape, and where the gluing and pressing process is re-enacted on a far larger scale. A mobile, corrugated building seated on wide tracks and housing a steam blower is now pushed atop the jig. For varying periods—usually totaling about 14 hours—the jig-molded, laminated section is subjected to controlled steam heating, followed by cooling.

After rough sanding to remove glue particles, the sections are sawed and finished to

their exact specifications. Every piece carries designation marks and is ready to move into its predetermined place in the hull. The rest is conventional carpentry, though more than 90 percent of the completed ship—keel, stem, frame, decking, even the rudder—is of laminated pieces.

And, while neither magic nor mirrors is employed, ship carpenters, the master craftsmen of yesterday, continue to be amazed at this miracle of converting little ones into big ones to create modern "iron ships of wood." ★ ★ ★

A ship is born. Over 90 percent of the USS *Implicit*, 171-foot Navy mine sweeper, is constructed of laminates

