TABLE II—*continued*

HARDWOODS—*continued*

STANDARD NAME.	BOTANICAL NAME.	SOURCE.	WEIGHT (lb. per cub. ft.).	CHARACTERISTICS.	USES.
Teak, Rhodesian . .	*Baikiœa plurijuga*	Northern and Southern Rhodesia	57	Reddish brown, occasionally with irregular black markings or flecks; straight or slightly interlocked grain; difficult to work; very hard, strong and durable. Not a true teak.	High-class flooring.
Walnut (English, European, Black Sea, French, Circassian and Italian walnut)	*Juglans regia*	Europe, including British Isles	41	Variable in colour, irregular dark veins on a greyish brown background producing beautiful figure; finely figured burrs and crotches; hard, tough, strong, moderately durable; fine texture; takes an excellent polish.	Superior decorative work, including panelling, furniture; burrs and crotches highly valued for veneers; gun and rifle stocks.
Walnut, African (Benin and Nigerian walnut)	*Lovoa klaineana*	West Africa	35	Yellowish brown background with dark markings (due to gum veins); interlocked grain producing ribbon or stripe figure. Not a true walnut.	Superior decorative work and joinery.
Walnut, American Black	*Juglans nigra*	U.S.A.	44	Similar to English walnut, but darker and more uniform in colour.	Similar to English walnut. Diminishing supplies and demands.
Walnut, Queensland (Australian walnut)	*Endiandra palmerstonii*	Queensland, Australia	46	Light or pinkish brown to dark brown, with varicoloured markings; interlocked and wavy grain producing a broken striped figure; difficult to work (dulls tools).	Superior decorative work such as panelling, veneers, furniture, plywood.
Whitewood, Canary (American whitewood)	*Liriodendron tulipifera*	U.S.A.	32	Yellowish brown with greenish tinge; diffuse porous, pores just visible; growth rings distinct, rays indistinct; straight grained, easily worked; stains and polishes well.	Joinery, plywood. High cost restricting its use, obeche (p. 23) being used as a substitute.

NOTE.—*Some timbers are also known by those names appearing within the brackets in the first column.*

PREPARATION OF TIMBER

Hand tools used by the carpenter and joiner are described on pp. 126-130, Vol. I. The considerable use now made of woodworking machinery has revolutionized those sections of the building industry in which timber is employed. Machines have speeded up output and reduced costs, and comparatively little hand labour is needed in the well-equipped workshop, as practically all woodworking processes normally required can be done by machinery. Certain of the heavier machines used in the conversion of timber have been described on pp. 5 and 6. The following are some of the machines which are used in the preparation of timber: (1) Circular sawing machine, (2) band sawing machine, (3) planing and surfacing machine, (4) surface-planing and thicknessing machine, (5) panel planing and thicknessing machine, (6) moulding machine, (7) spindle moulder, (8) planing and matching machine, (9) mortising machine, (10) tenoning machine, (11) double-dimension saw bench, (12) dovetailing machine, (13) lathe, (14) mitreing machine, (15) sand-papering machine, (16) universal woodworker and (17) sharpening machines.

1. CIRCULAR SAWING MACHINE OR CIRCULAR SAW BENCH (see G, Fig. 5).—This, consists of a vertical circular saw, protected by a guard to which a riving knife is attached, and a metal guide or fence. The spindle of the saw is mounted on a frame having a flat metal table. The saw varies from 9 to 60-in. in diameter and the table or bench is from 2½ to 8-ft. long and 2 to 3¾-ft. wide. The revolving saw runs in a slot in the table. The fence, which is parallel to the saw, can be readily adjusted, the distance between its face and the saw being regulated to the width to which the timber is to be sawn. Some machines have fixed tables, whilst others have "rising and falling" tables and fences which can be canted through 45°, the latter being useful for bevelling. This machine is extensively employed for general sawing purposes, such as sawing baulks into planks, deals, etc. (known as *deep-cutting*), or into smaller scantlings (called *flat-cutting*), ripping, edging and cross-cutting. Each piece of timber is pressed against the fence (unless it is to be cross-cut), which has been adjusted to the required distance from the saw, and fed towards the rotating saw; the pressure is maintained as the timber slides forward on the table during the cutting operation. The riving knife, which is immediately behind the saw, widens the cut in the timber and thus prevents pressure on the saw.

Circular saws are made of crucible cast steel plates. The common form, shown at A and P, Fig. 6, and known as a *plate saw*, is a disc of uniform thickness or gauge throughout, the thickness depending upon the size of the saw and the character of the wood to be sawn; thus, the normal thickness of a saw of 24-in. diameter is 12 B.W.G. (approx. $\frac{1}{10}$-in.) for hardwoods and 13 B.W.G. for softwoods, whilst the thickness of a 30-in. saw is 11 B.W.G. for hardwoods and 12 B.W.G. for softwoods. They are conveniently divided into *rip saws* (those which cut with the grain) and *cross-cut saws* (which cut across the grain). As the fibres of the wood are parallel to the plane of the saw during ripping and perpendicular during cross-cutting, and as timbers vary in hardness, it follows that the shape of the teeth differ in accordance with the work for which the saw is to be used.

Sketches of teeth of a rip saw are shown at B and C, Fig. 6, and those of a cross-cut saw are shown at D and E. The names of the various parts are indicated on the enlarged elevations G and M. The *hook* or *rake* is the inclination of the *front* or *face* of the tooth; in all ripping saws the cutting *point* of a tooth is forward to form a *forward hook* (see G and M); the teeth of cross-cut saws have usually a *backward rake* (see E and D) and occasionally no