

bronze alloys (such as gilding metal), nickel alloys (*i.e.*, monel metal), galvanized and stainless steel, etc., and the sheets are rolled to a very thin gauge. The metal is bonded to the plywood by special waterproof cements. When metal-faced on both sides, the edges of the boards are sealed (one finish is shown at G, Fig. 40) in order to exclude moisture and prevent corrosion of the inner surface of the metal.

Metal-faced plywood is used for wall panelling (single metal faced), counter tops (bars), partitions between public bath and water closet cubicles, etc. The metal increases the rigidity of the boards, preventing buckling, and it can be easily cleaned. Metal angles are used as a protection at the edges and external angles of counters, panelling and laminboard (see below); these, in addition to narrow vertical, etc. metal bands when inlaid flush with (or screwed to) the plywood surface, provide an effective treatment to wall panelling, counter fronts, etc.

LAMINBOARDS OR LAMINATED BOARDS (see M, Fig. 40) are a development of plywood and are used extensively for panelling, furniture, partitions, doors (see H, Fig. 25), etc. A laminboard consists of a core built up of thin strips or slats (or laminæ) not exceeding 7 mm. ($\frac{5}{16}$ -in.) wide and glued between two or more outer plies. The slats are glued together and, as in plywood, the grain of these core slats must be at right angles to the adjacent plies. The strips forming the core are cut from built-up sheets which have been rotary cut (see p. 98).

The following is a brief description of the manufacture of laminboards: The peeled veneers, having been cut to width and dried to 7 to 10 per cent. m.c., are glued and assembled to form a pile of approximately 2-ft. thick (80 veneers of $\frac{5}{16}$ -in.) between two thick cauls (p. 100). Only every alternate sheet is passed through the glue-spreader. The pile is taken to the press and clamped as described on p. 101. The adhesive is usually casein, and the pile (or "block" or "balk") is generally cold pressed. The balk is then converted into slabs of various thicknesses (see next column) by passing it through a frame saw or a horizontal or vertical band saw, the cuts being at right angles to the layers—similar to O, Fig. 40. Two or more slabs are edge glued to form the necessary width of core, which is then re-dried to the required m.c., planed to the necessary thickness, and finally glued (resin adhesive may be used), assembled between the two or more face plies (which have been previously jointed to the required width), pressed, re-dried, trimmed and sanded as previously described.

The standard dimensions of laminboards vary with different manufacturers, a common size being 6-ft. long, 16-ft. wide and $\frac{1}{2}$ to 2-in. thick.

BLOCKBOARDS.—These resemble laminboards, the only difference being in the construction of the core which is built up with blocks of wood not exceeding 1-in. wide (see N, Fig. 40). They are cheaper than laminboards and are used for similar purposes, although laminboards are preferred for first class richly veneered work.

With exception of the preparation of the core, the various operations of manufacture are similar to those of laminboard. Logs from which the timber is obtained for making the cores are converted into boards by a large vertical band re-saw (see p. 6). These boards are at least 10-in. wide and approximately 1-in. thick. The boards must be carefully seasoned and dried to the required m.c. (4 to 7 per cent.); the ends are then cut by a cross-cut saw and any large knots or defective portions are removed. The boards are assembled into piles, the lengths being built up as required and the joints staggered. Gluing, re-assembling, pressing, sawing (see O, Fig. 40), re-drying and planing operations are carried out, care being taken in re-assembling to ensure that the boards are arranged heart side to heart side in pairs to neutralize warping (see p. 8). The cores are then glued, assembled between the outer plies, pressed, etc.

The standard sizes of blockboards are similar to those of laminboards.

BATTENBOARDS (see P, Fig. 40).—With exception of the core these are similar to blockboards. The core is comprised of close-grained battens, not exceeding 3-in. width, which are edge glued. They are not used extensively in this country, laminboards and blockboards being preferred.

COMPOSITE BOARDS.—A composite board consists of several wood plies with one or two layers of asbestos fibre (p. 121) or other insulating material (see H, Fig. 40). Asbestos is a good non-combustible and sound insulating material, and it is light in weight. The sheet of asbestos is soaked in weak glue size, dried, and casein glued between sheets of wood ply. When used for covering ceilings, walls and partitions, this material renders rooms cooler in summer and warmer in winter, reduces sound transmission (p. 49), and is relatively non-inflammable.