

Half-round clay ridge tiles, buff coloured, are sometimes used with good effect.

Comparatively large timbers are necessary to support the heavy weight of this covering. In the example, 5-in. by 2-in. spars are used at 15-in. centres. They must be strongly purlined.

In both details the traditional method, still employed, of torching is shown. Untearable felt, nailed to the backs of the spars, may be used in lieu of torching, provided pegs (which would penetrate the felt) are not used. For first class work, and in order to maintain an equable temperature within the buildings, the roofs may be boarded, felted, counter-battened and battened, as previously described.

VERGES AND ABUTMENTS.—Verges may be open, with the undercloak projecting some 2 to 3-in., as described for tiling. Alternatively, a very satisfactory finish is provided by a low parapet wall, having a simple coping under which the slates are flaunches with mortar fillets (see Fig. 45). This is known locally as *tabling*, and is often finished with apex stones and kneelers similar to those shown in Fig. 21, Vol. I.

VALLEYS.—Unquestionably, the most suitable form is the swept valley. This is formed in a somewhat similar manner to that shown in Fig. 42, a valley board being used to block out the angle, and two or three stone slates in each course are cut to a wedge shape as required. Usually, courses having three cut slates at the valley alternate with courses each having two specially shaped slates. In the "three cut" courses, the middle slate or *bottomer* has both sides cut to form a wedge shape and the tail may be slightly curved to the sweep; the slate on each side, called a *skew* or *lye-bye*, has its edge next to it cut to fit. The next course has two wide *skews*, cut and mitred centrally over the *bottomer* below, with their tails sometimes slightly curved.

Laced valleys (see Fig. 42) are occasionally preferred.

HIPS.—These are preferably avoided, but if adopted, the adjacent slates should be neatly cut to a mitre and lead soakers inserted (see Q and R, Fig. 69, Vol. I).

Whilst this form of covering has a most attractive appearance and has, in the past, been employed most effectively in many parts of the country, it has been largely superseded by materials which are cheaper than, and often greatly inferior to, those obtained locally. As a result the necessary skilled labour for this class of work is relatively scarce.

SHINGLES

Shingles are thin slabs of wood used to cover roofs and walls. Although they are used extensively in Canada and the U.S.A., where a suitable timber is readily available, they have not been employed to any extent in this country. There are several reasons why, in the past, they have not found favour here, including a scarcity of satisfactory local material, the plentiful supply of many

other forms of roofing coverings and the added danger from fire. Regarding the latter objection, experience has shown that in those parts of America where shingles are in general use an exceedingly small percentage of fires have been directly attributed to the covering. Further, shingles can now be rendered fire-resisting by the application of a fireproof paint on both sides.

Formerly, the shingles used in this country were usually of oak and occasionally of elm and teak. They were split or rent, and such hardwood slabs required to be bored to receive the nails.

Within recent years such shingles have been practically superseded by those of western red cedar, imported from Canada. This timber (see Table I) is very durable, light in weight, straight grained and of a reddish-brown colour which assumes an agreeable silver-grey tone when exposed to the weather. It is reputed to shrink less than any other softwood and is resistant to insect attack.

Cedar shingles are either sawn or split.

Sawn shingles are used chiefly. A sketch of one is shown at B, Fig. 49. The length varies from 15½ to 16½-in., 16-in. being the standard. They are obtained in random widths, varying from 2½ to 14-in. They are approximately ⅝-in. thick at the tail or *butt edge* and taper to ⅓-in. or less at the head. They are cut from quartered logs and should be rift sawn (see p. 4). Such shingles, commonly known as *edge grained*, should always be used for good work for the reasons stated at A. This also shows a sketch of a quarter log, 16-in. long, and a few slabs to indicate that they are sawn with their butts and heads alternating and at right angles to the annual rings. Flat or plain sawn (see p. 4) shingles, known as *slash grained* and produced by a cheaper method of conversion, should never be used except for inferior work, as the shingles, being sawn tangential to the annual rings (see C), will quickly warp, shrink and split when exposed, and they are liable to decay.

Split, cleft or rent cedar shingles are generally considered to be of better quality than the above, but relatively few are used in England. They are certainly stronger than sawn shingles and are regarded as being more durable. They are also thicker and longer, the length being up to 25-in.

Oak shingles are generally hand-split. The size of these varies from 12 to 27-in. by 4 to 6-in. by ⅞ to ½-in. They are, of course, very strong and durable. Cypress shingles have also a good reputation, but, like those of the oak variety, they are not generally used.

DETAILS (see Fig. 49).—Whilst these refer to cedar shingles, the principles of construction also apply to those of other timbers. As already stated, cedar is very light in weight (shingles weigh approximately 1½-lb. per sq. ft. or about one-tenth that of plain tiles) and consequently a big economy results in the size and/or number of spars. Thus, if 4-in. by 2-in. spars are used, they are usually spaced at 2 to 2½-ft. centres. Neither close boarding nor roofing felt should be used for cedar shingles¹ to ensure a free circulation of air round them. The groundwork is therefore battens fixed direct to the spars. The size of the former

¹ Oak shingles are usually fixed to close boarding.