

posts to provide fixings for the boards of 3-ply. The posts are connected at the top by a 3-in. by 3-in. head (see D and A). Two vertical 3-in. by 3-in. studs are stub-tenoned to the head and strings. Both sides of this framing are covered with 3-ply (see A, D, F, H and J). The manufacture and characteristics of this material are described on pp. 97-103. Two alternative joints between the plywood boards are shown at G and H. The former shows the boards to be butt or square jointed; the thin wood strip which covers the joint is secured by panel pins which are punched and the holes made good with suitably coloured wood mastic or stopping to render them inconspicuous. When chamfer jointed (H), the boards are panel pinned, and these fixings are concealed in a similar manner; this joint can be safely employed under normal conditions, as the better graded plywoods shrink very little (see p. 102).

The handrail at the top flight is shown at D. Whilst this simple treatment is effective in appearance, it is rather wide, and therefore a tapering handrail, such as that at F, Fig. 34, is sometimes adopted; alternatively, a chromium plated circular tube, or one similar to J, Fig. 30, secured by short vertical standards to the rail at D, may be used. The handrail for the lower flight, indicated at A, Fig. 35, is of circular section as above; this is bent at the ends and screwed to the newels; two additional intermediate brackets would be required. The rail at D is continued down the post at the half-space landing, and a similar edging is fixed to the longer post (see J) in order to protect the edges of the plywood and provide a suitable finish.

The difficulty of making a good finish between the plywood and the steps is overcome if thin, narrow *margin fillets* are planted on the face, and these short horizontal and vertical pieces are mitred (see A, E and F, Fig. 35).

The bottom step is bull-nosed (as shown) or splayed (see Fig. 39).

If desired the walls of the stairway may be panelled to conform with this balustrading.¹ As shown at A, the height of this dado panelling is the same as that of the handrail, the capping (see detail at B), of similar projection and depth as the handrail, lining through with the window board. This detail shows the plywood and capping to be fixed to 2-in. by $\frac{3}{4}$ -in. grounds plugged to the wall. The skirting is of the same size and section as the margin fillets.

An alternative detail to B is shown at C. Here the panelling consists of 3-ply panels with top and bottom rails and stiles, the top rail being finished with a plain splayed capping. The balustrade should be similarly treated to conform (see Fig. 37).

The sketch at A, Fig. 35, shows that the flush door is in keeping with the general design. A detail of a laminboard (see p. 70) door is given at K. The architrave may be as shown or, alternatively, the section may be the same as that of the simple skirting. Another example of a plywood covered balustrade is shown at O', Fig. 29, and serves as a contrast to the traditional framed panelling at N'.

¹ Panelling is more fully detailed and described in Vol. IV, as this subject is generally deferred until the third and fourth years of the course. It is only briefly referred to here in order to draw attention to recent developments and to enable students to make a comparative analysis.

OPEN WELL STAIR

The open well stair has a space or well between the outer strings, and in this respect it differs from the dog-leg stair. This separation of the strings greatly enhances the appearance of the stair. More space, of course, is needed to accommodate it, but the extra width over that required for the dog-leg stair need not exceed 6-in., and when planning a staircase it is well worth while trying to obtain this additional width because of the satisfactory results which can be achieved.

Key plans of a house showing the application of an open well stair appear at A and B, Fig. 36. Enlarged plans of the stair are shown at E and F, and two sections developed from them are illustrated at C and D.

Much of the construction is similar to that already described. The plan at E shows three flights, each 3-ft. wide, with two quarter-space landings.

But for the presence of the door to bedroom No. 5 (see B and E), an alternative arrangement would be somewhat similar to that shown at C, Fig. 29, where a half-space landing is provided. This latter arrangement, however, would make impossible the provision of the cloakroom.

The going of each step is 9-in. As the height from floor to floor is 9-ft. 6-in. (see D) and there are sixteen steps, the rise of each equals $9\text{-ft. } 6\text{-in.} \div 16 = 7\frac{1}{8}\text{-in.}$ Thus the going, plus twice the rise, equals $23\frac{1}{4}\text{-in.}$ (see rule 1, p. 82).

Three of the newels are bolted to joists at the ground level, and the balustrade is continued at the first floor to two newels and a half newel having shaped drops similar to the caps. The headroom is approximately 7-ft. 4-in. if, as shown at C, the balustrade is returned with the newels in line with the centre of the dining-room door. Although the soffits of the middle and top flights are plastered (see D), only 10-in. wide outer strings need be used, provided three bearers are employed at each short flight (see C, D and E). A simple but satisfactory treatment results (see O), which detail shows a slight projection of the string beyond the face of the plaster; wider strings would give a less effective appearance. One rough carriage or bearer is only required at the bottom flight, as this soffit is not plastered.

Details of the balustrade are shown at J, M and O. Note the simple treatment of the handrail consisting of two members. A rail to which the balusters are tenoned is also fixed to the floor of the landing (see M), and a 2-in. by $\frac{5}{8}$ -in. fillet is used to cover the floor board, etc. The newel caps and drops are octagonal shaped out of the solid.

CLOAKROOM.—The plans at A and F show that some of the space under the stair has been utilized to form a cloakroom in which there is a lavatory basin and a water closet. The partitions consist of 2-in. thick concrete or $1\frac{1}{2}$ to 2-in. thick plaster slabs (see also C and D, and pp. 45 and 47) which are jointed in mortar and nailed to the floor, newels, etc.; stoothings may be used as an alternative. A metal window provides the necessary lighting and ventilation (see also Fig. 37). The water closet and flushing cistern (shown at F and by