fluted band. A somewhat similar motif is used at the cornice K. Cornice L has a relatively large projection; the soffit of this type may be relieved by raised panels or *mutules*.

The section at N shows a cornice complete with parapet, etc. An economy in stone results when a cornice is of this compound type, as a relatively small block is required as a crowning member.

It will be noticed that all of these cornices are throated to prevent staining of the masonry below.

STONE STEPS AND STAIRS

The design and construction of wood stairs are described in pp. 78-97, Vol. III, and there illustrated in Figs. 29-39 inclusive. As the terms, essential requirements, proportions of steps, etc., are dealt with in that volume, and as they apply equally well to stone steps and stairs, it is unnecessary to repeat such information here, and students are therefore recommended to defer consideration of the following until they have studied the principles of wood stair construction.

The stone selected for steps and landings must be hard, strong and durable, and it should not readily wear to a smooth and slippery surface. Certain of the sandstones best satisfy these requirements, and "York" stone (see p. 89) is usually specified.

STEPS are either (1) rectangular, (2) built-up, or (3) spandril in cross-section.

1. *Rectangular Steps*.—These are illustrated at H, J, K, L, M, N and O, Fig. 44, Fig. 38 and in Vol. I. They are the strongest type. A flight of such solid steps may be constructed with the front lower edge of one step supported on the top back edge of that below (see L and N, Fig. 44), but the rebated or checked joint (similar to that at G, Fig. 44) is the best. These steps may be provided with moulded nosings (see G and H, Fig. 44, Fig. 37 and Fig. 38).

2. *Built-up Steps* (see E and P, Fig. 44).—The tread and riser of each step are formed of relatively thin sawn slabs, and the construction is therefore economical. They are not so strong as solid rectangular steps, and whilst occasionally used without any bedding or backing (see P), they are more often applied as a facing to concrete steps (see E). The minimum thickness of treads which are only supported at the ends is 2-in. and this should be increased by at least ½-in. for every extra foot of unsupported length beyond 3-ft. Slabs which are less than 2-in. thick can be easily fractured, even when being handled before and during fixing, and thin treads constructed as shown at E can readily snap by a weight suddenly applied unless solidly bedded throughout.

Steps formed of stone treads only, known as *skeleton stone steps*, are sometimes employed for short, narrow flights, which are not subjected to heavy traffic and where the absence of risers is not objected to.

3. *Spandril Steps* (see A, B, C, D and E, Fig. 45).—Excepting the ends which are built into the wall, these steps are approximately triangular in cross-section, and are therefore lighter than the solid rectangular type. Such steps add greatly to the appearance of a stair and the maximum headroom is obtained by their use. The soffit may be flush (see A and B), broken (see C) or moulded (see D). A splayed rebated joint is formed between each step, the splay of the rebate being normal to the pitch of the stair. To avoid weak construction and damage to the step at its back edge (where it is thinnest), it is usual to have a 2-in. splay (see A) for stairs not exceeding 4-ft. in width, and this is increased by ½-in. for every additional foot in width.

THRESHOLDS.—In addition to those illustrated in Vol. I, there are several thresholds shown in Figs. 37, 38 and 44. An example of one in which built-up steps are employed is shown at A, B, C, D and E, Fig. 44. The treads and risers are solidly bedded and well jointed in cement mortar (1 cement to 3 sand). The treads of all external steps should be given a slight fall to throw off the weather; the fall shown at E is ⅛-in. The top edge of the nosing should be slightly rounded off (it is sometimes chamfered), otherwise it may be easily damaged. The nosings may be moulded; several examples of moulded nosings are shown at G, Fig. 44. A, B, C, D, K, L and M, Fig. 45, Fig. 37 and Fig. 38. Solid rectangular steps may also be used as an alternative. Alternative facings to the wall are shown, that on the left being of ashlar with a brick backing, and on the right a brick cavity wall is shown, having a Flemish garden wall facing (see B, Fig. 18).

The application of solid rectangular steps forming an unimportant entrance is shown at L, M, N and O, Fig. 44. The steps are built solidly into a wall at one end and supported at the other by a dwarf wall (see L and M). The front lower edge of one step is bedded in cement mortar on the top back edge of the step below (see N). Whilst this form of joint is good enough for a flight of this description, it is not employed in first-class work as open joints appear if the mortar bedding becomes defective. Note that the going (10-in.), plus twice the rise (7-in.) as shown at N, equals 24-in. (see p. 82, Vol. III).

The detail at P shows the construction of built-up steps which could be adopted as an alternative to the above. The treads and risers are connected together by means of three pairs of copper (or slate or other non-corrodible material) cramps or dowels bedded in cement mortar.

The simple balustrade consists of 1-in. square wrought iron balusters to which a handrail of similar material is screwed (see K, Fig. 45), holes being drilled through the handrail and the ends of the balusters (which would also be tapped) to receive the screws; one end of the rail is also built into the wall to ensure greater rigidity. The balusters are secured to the steps and landing in a manner shown at K and M, Fig. 45; dovetailed mortices are formed to receive the ends (preferably ragged to give a key) of the balusters; molten lead is then run in, well caulked (consolidated when cool with a blunt chisel) and covered flush with cement mortar to exclude water from the lead and thus prevent discoloration of the stone. Grouted cement is a cheaper alternative to lead. As an alternative to the metal balustrade, the wall may be continued to a convenient height and finished with a coping.