each heading course set back slightly in relation to the stretching course; this irregularity is not so pronounced if the wall is built in Flemish bond as each course consists of alternate headers and stretchers, and therefore the slight set-back of the short headers is better distributed and is considered to improve the surface texture or character of the work.

Square Stopped Ends.—On reference to the elevation D and the plans E, F and G, Fig. 4, it will be seen that in every alternative course a queen closer is placed next to the quoin header so as to provide a lap of approximately $2\frac{1}{4}$-in. This agrees with the rule for English bond. Attention is drawn to the units of which *every* course in each wall is comprised and which are indicated within the broken diagonal lines. The notes on Fig. 4 should be carefully studied

(2) *Single Flemish Bond* consists of a *facing of Flemish bond* with a *backing of English bond* in *each* course (see H and J, Fig. 4). It is adopted where expensive facing bricks are required to give the characteristic appearance of Flemish bond and where comparatively cheaper bricks are used as a backing. This bond cannot be applied to walls which are less than $1\frac{1}{2}$-brick thick. It is relatively weak, as can be seen on reference to H and J, which show 9-in. long continuous vertical joints appearing in the longitudinal joints. Note that half bats are used which are known as *snap headers* or *false headers*. An alternative arrangement of bricks in the 2-brick wall at J is shown at K (where the snap-header and full-header backing are substituted by two three-quarter bats); this results in a reduction in the length of the continuous vertical joints with a corresponding increase in strength, but at an increase in cost due to the labour and wastage of bricks involved in the cutting of the three-quarter bats. This alternative bond may also be substituted for the corresponding course of the $1\frac{1}{2}$-brick wall (H).

The comparative weakness of single Flemish bond is illustrated at L, Fig. 4, which shows a perfectly bonded 18-in. wall built in English bond and an inadequately bonded wall of the same thickness built in single Flemish bond; the continuous vertical joint shown by a thick line in the section through the latter wall is 9-in. wide, as shown in the plan at J, Fig. 4.

JUNCTIONS AND QUOINS

The key plan at A, Fig. 3, shows several connections between walls. One type of connection is termed a *junction* (D, E, U, W and X) and another form is known as a *quoin* (F and Y).

JUNCTIONS.—These are classified into right-angled junctions and squint junctions.[1] There are two forms of right-angled junctions, *i.e.*, (*a*) tee-junctions and (*b*) cross-junctions or intersections.

(*a*) *Tee-junctions.*—A tee-junction is a connection between two walls which on plan is in the form of the letter T (see D, U, W and X in the key plan).

Plans of tee-junctions between walls built in English bond are shown at A, B and C, Fig. 5. At A one of the courses of the $4\frac{1}{2}$-in. internal division wall enters the stretching course of the 9-in. external main wall, giving a $4\frac{1}{2}$-in. lap, and the alternate course of the division wall butts against the heading course of the main wall. Note the following in connection with details B and C: (1) the heading course of the internal wall is bonded into the stretching course of the main wall, the first header or tie brick (shown shaded) giving a $2\frac{1}{4}$-in. lap and being adjacent to a queen closer; (2) the stretching course of the cross wall butts against the heading course of the external wall. The tie bricks are also shown in the section at K, Fig. 5.

Plans of junctions between external walls built in double Flemish bond and English bonded division walls are shown at F and G, Fig. 5. As in the above examples, the key header has a lap of $2\frac{1}{4}$-in.

(*b*) *Cross-junctions or Intersections.*—A cross-junction is an intersection between two continuous walls (see E in the key plan at A, Fig. 3). Details are given at D and E, Fig. 5; the walls are shown in English bond, it being assumed that they are to be plastered. Note: (1) one of the courses is continuous and the course at right angles butts against it; (2) these continuous courses alternate; and (3) a key header forms a $2\frac{1}{4}$-in. lap at each side of the non-continuous course.

The above are only a few examples of several methods of bonding at junctions. The arrangement of the bricks depends largely upon the relative position of the walls. Variations to these examples will be necessary when a continuous transverse joint in the main wall does not coincide with a face of the entering course of the adjacent wall. The essential requirements are the avoidance of continuous vertical joints with the employment of the minimum number of broken bricks.

QUOINS OR EXTERNAL ANGLES.—There are two forms of quoins, *i.e.*, right-angled or square quoins and squint quoins.[1] As is implied, a right-angled quoin is formed by two walls which meet at 90°. Examples of right-angled quoins are shown at F and Y, Fig. 3.

Square Quoins in English Bond.—Plans of alternate courses of right-angled quoins formed by walls built in English bond are shown detailed at A, B and C, Fig. 6. The following should be noted:—

1. At the same level, the heading course on one face of the angle is returned by a stretching course; thus at A the heading course P is returned by a stretching course similar to R.
2. There are no continuous vertical joints.
3. When the wall is an *even* number of *half*-bricks in thickness the brick figured 3 is a *header* projecting $2\frac{1}{4}$-in. (see A and C, Fig. 6).
4. When the wall is an *odd* number of *half*-bricks thick, the brick figured 3 is a *stretcher* projecting $2\frac{1}{4}$-in. (see B, Fig. 6).
5. At the $2\frac{1}{4}$-in. projection (or quarter bond) of number 3 brick the transverse joint is continuous (see M at B, Fig. 6).
6. In the 1 and 2-brick quoins the heading course of one wall is continuous to the front of the return face and that in the $1\frac{1}{2}$-brick quoin is continuous to

[1] Squint junctions are detailed in Chapter One, Vol. II.

[1] Squint quoins are usually dealt with in the second year of the Course and they are therefore detailed in Chapter One, Vol. II.