The diamond saw consists of a circular steel blade, one size being 5-ft. in diameter and ¼-in. thick. Some 240 diamonds are secured in small U-shaped sockets round the edge of the blade. The slab of stone is clamped on to a moving table which is caused to travel towards the blade at a uniform rate; at the same time the blade rotates at a speed which varies from 500 to 600 revs. per min., a common speed being 560 revs. per min.

The cutting rate of the diamond-saw machine depends upon its horse-power and the hardness of the stone. Thus a 20-h.p. machine will cut from 100 to 160-sq. in. of Portland stone per minute (*i.e.*, if the stone is 20-in. deep, the rate will be 5 to 8-in. per minute). Whilst this rate is considerably faster than that of the frame saw, the circular saw can only deal effectively with comparatively thin stones which are less than 3-ft. thick, the thickness in respect to some machines being limited to 1-ft. 6-in. Further, only limestones or soft sandstones should be cut by means of the diamond saw as hard sandstones cause an excessive wearing action on the sockets and blade.

The carborundum saw has a 2-in. wide continuous rim of carborundum which is dovetailed round the periphery of the steel blade.

The cutting rate of the carborundum saw is half that of the diamond saw. It is preferred to the diamond saw on account of the more accurate work which it produces, and it is therefore very suitable for the *jointing* (forming the ends) of cornices and similar stones which have been moulded. Cuts as fine as ¼-in. are obtainable.

Water is supplied during the cutting operation in order to cool the blade of each of the above two circular saws. Some circular saws have two blades. Another type consists of a blade which traverses the fixed stone as it rotates, and it is therefore particularly useful for cutting long stones.

The above operations are usually all that are necessary for the cutting and dressing of stones for walling, but it is sometimes required to have the surface of each stone which will be exposed when fixed, *rubbed* so as to remove the machine marks. This is accomplished on a machine called a *rubbing bed.*

A rubbing bed consists of a steel circular table, about 10-ft. in diameter, which rotates. The stone is placed on the bed, clamped from above, and as the table rotates, the abrasive action of carborundum, sand and water eliminates the machine marks. It takes approximately twenty minutes to polish one face of a block of Portland stone of average size. Small surfaces are rubbed by applying sand and water to the surfaces whilst a piece of the same stone is worked over them.

Cornices, string courses, plinths, etc., are moulded by means of *planing and moulding machines.* After the moulding operations have been completed as described below, the stone is jointed into the required lengths by the carborundum saw as explained above. Intersections of mouldings are usually worked by hand, the maximum length of mouldings being machined so as to reduce the hand labour to a minimum.

A simple type of planing and moulding machine consists of a cutting tool of cast steel which is suspended from a box at an angle of about 45°. Cutting tools are of various shapes and sizes and their cutting edges are shaped the reverse of the desired moulds. One end of the stone is first hand-moulded to the required section; this is done by the banker mason on his bench. The stone is then clamped to the table in such a position as to bring the surface to be tooled uppermost. The tool or chisel is caused to traverse the stone backwards and forwards until sufficient stone has been removed to conform with the section cut at the end.

In another type of planer the stone is fixed to a table which moves backwards and forwards below the tool which is fixed.

In both of these types, after the tool has traversed the stone on the forward journey, the box or head automatically swings over, bringing the tool in the correct position for the return traverse.

Another type of machine has four cutting tools and is therefore particularly effective for large cornices.

There is also a moulding apparatus known as the *Pneumatic Dressing and Carving Plant.* This consists of an air compressor which operates tools of various shapes and sizes called pneumatic hammers. The finest carving, as well as the heaviest dressing, can be executed by these tools.

HAND DRESSING.—In the absence of machinery, the following are certain of the operations which are performed by hand:—

Splitting, Stoping, Wedging or Coping.—A large block of stone is split into smaller units as shown at B, Fig. 19. Straight lines are marked on three of the faces along which a narrow groove is chiselled by means of the punch (6, Fig. 19) or wide chisel called a nicker. Shallow holes at 6 to 9-in. centres are formed along the groove, a steel bar is placed under the stone in the same plane as the groove, steel wedges or gads or wedges and feathers are placed in the holes, and the wedges are gradually and uniformly hammered in until the stone splits.

Large blocks of hard sandstone are divided at the quarry as described but the work is expedited by using a pneumatic drill to form 4 to 6-in. deep holes to receive the wedges.

Snapping.—This is adopted for splitting hard stones which are about 6-in. thick. In splitting a block of stone, a groove is formed on all four sides and in the same plane. The pitching tool (1, Fig. 19) is held vertically and struck smartly as it is moved along the groove on each face. A piece of waste stone is placed under the block and a few blows of a heavy hammer on the latter (which is protected by a piece of wood) will be sufficient to snap the stone. Alternately, a continuous nick is formed across the top and both sides, the block is turned over on to a small stone and a smart blow with a heavy hammer is sufficient to split it.

Bath or similar stone is best divided into units by sawing immediately after the stone has been quarried, as it then contains moisture (called *quarry sap*) which renders it comparatively soft.

Forming a True Face.—A true face is worked on the stone as follows and as shown at D, Fig. 19. The *marginal draft* E is first formed; this is made by the mason using a drafting chisel (22, Fig. 19) and wood mallet (24) to remove the superfluous stone to a level slightly below that of the deepest hollow on the rough face. The draft must be level as tested by a straight-edge, although an experienced mason can dispense with this. A similar draft is formed at F which is parallel to and in the same plane as E in order that the face shall be