cooled drums, (7) automatically cut into 24-yd. lengths, and (8) finally wound into coils by a winding machine.

Application of Vertical Damp Proof Courses.—As stated on p. 17, Vol. I, the object of a horizontal damp proof course provided in a wall at least 6-in. above the ground level, is to intercept water absorbed from the soil and prevent it from rising up the wall. It is clear that this will not stop water from passing through a basement wall from the adjacent earth. Therefore it is necessary to introduce a vertical damp proof course which must extend from the above horizontal damp proof course down to a second horizontal course at or near the base of the wall.

Several alternative details showing the damp proofing of basements are illustrated in Fig. 20. A section through a basement is shown at A, in which a damp proof course in the thickness of the floor is continued vertically up each wall to the horizontal course placed at a minimum height of 6-in. above the ground level. The damp-resisting material thus forms a waterproof tank, preventing water from passing through the floor and walls adjacent to the earth, in addition to intercepting water absorbed from the ground which would otherwise pass up the walls above the ground level.

The damp proofing material in details B, C, D, E and G is natural asphalt mastic. The blocks of mastic (see p. 54) are broken into small pieces, placed into a tank on the site, and gradually heated until the asphalt is sufficiently fluid to be applied. With exception of detail E, the vertical damp proof courses are situated within the thickness of the walls, and thus conform with what is considered to be the best practice.

Detail C shows one method of damp proofing a basement which has a joist and boarded floor. The $1\frac{1}{2}$-brick main wall has, in addition, a $4\frac{1}{2}$-in. thick outer leaf which is finished with a plinth course. This leaf is built in stretching bond, and its function is to protect and retain the vertical damp proof course.

The wall is built up to the level of the lower damp proof course of asphalt or other approved materials described on pp. 17 and 18, Vol. I. It is constructed in the following manner: The main $1\frac{1}{2}$-brick wall is continued for three or four courses, and the joints on the outer face are raked out to a depth of about $\frac{3}{4}$-in. to afford a key for the vertical asphalt. A similar number of courses of the outer leaf are built at a distance of $\frac{3}{4}$-in. from the main wall. This cavity is maintained and mortar droppings prevented from falling into it, if a length of 11-in. by $\frac{3}{4}$-in. board is placed next to the main wall as the leaf is constructed. This board is removed and the cavity is filled with molten asphalt from a pail; a length of floor board supported on the leaf by small splayed blocks and tilted towards the cavity facilitates this operation. A metal rod is used to consolidate the asphalt and prevent the formation of air voids. Care must be taken to ensure that the cavity is entirely free from mortar droppings before the asphalt is poured, otherwise water may be subsequently transmitted through such porous material to the main wall. The wall and vertical damp proof course are formed in short "lifts" in this manner until the position of the upper horizontal damp proof course is reached. The latter course is then applied and the normal construction of the wall continued.

Attention is drawn to the means of ventilation provided to safeguard the floor timbers against dry rot. Vertical shafts or flues, of 9-in. by $4\frac{1}{2}$-in. cross section, are formed at approximately 6-ft. intervals in the centre of the main wall during construction; openings are left at the inner face below the basement floor, and the upper ends are completed with the usual perforated air bricks, as shown.

Detail D shows an alternative and efficient method of damp proofing. The bottom layer of concrete known as the *subfloor* is covered with a $\frac{3}{4}$-in. thickness of asphalt laid in two separate coats (or a $1\frac{1}{8}$-in. thickness in three coats); this in turn is covered with a second layer of concrete, called the *loading floor* (as it counterbalances the upward pressure of subsoil water), and finished with wood block flooring (see p. 38, Vol. III).

The asphalt covering the subfloor is continued as a vertical damp proof course, additional asphalt being applied at the intersection between the horizontal and vertical layers, and finished as a splayed angle fillet, to prevent possible creep of moisture at the intersection. The vertical layer is formed as follows: The outer $4\frac{1}{2}$-in. thickness of the wall is first constructed in stretching bond up to the level of the horizontal layer; the joints of the inner face are raked out and dust, etc., removed by means of a stiff broom; the first coat of the hot asphalt, approximately $\frac{3}{8}$-in. thick, is then applied, it being spread or floated on by the aid of a *hand float* similiar to that shown at D, Fig. 23. The latter is applied with sufficient pressure until a smooth surfaced homogeneous layer of asphalt is obtained, free from voids or blow holes. Any blow holes must be stabbed, filled in and smoothed over. The second coat must cover the joints of the first. The finished thickness of two-coat work is $\frac{3}{4}$-in. For special work, and especially if water pressure has to be resisted, three separate coats are applied, the overall thickness being $\frac{7}{8}$-in. or, preferably, $1\frac{1}{8}$-in.

In order to provide a uniform backing for the asphalt, it is advisable to build the inner or main wall $\frac{3}{4}$-in. from the face of the asphalt. Grouted cement is run into this cavity as each four courses of the brickwork is built. If this is not done, spaces will be left between the asphalt and the outer face of the main wall, and any water from the soil forced through the outer leaf may seriously damage the unsupported patches of asphalt and gain entrance into the building. The cement grouted backing to the asphalt is shown in detail B.

The upper horizontal damp proof course may only cover the wall from the vertical layer to the outer face, or, preferably, extend for the full thickness of the wall as indicated by broken lines at D.

Sometimes the provision of subsoil drainage is made to remove the risk of damage to the vertical damp proof course. Thus, as shown at D, small diameter drain pipes (see Chapter Two) are laid butt-jointed in the trench and covered with about 2-ft. of gravel before the trench is filled in with soil. This subsoil drain is continued round