LAYING HOUSE DRAINS.

Under the cognomen of "An Old Hand" a writer in the Illustrated Carpenter and Builder gives the results of his experience, as follows : -

A drain may be watertight, but if not properly laid, deposits will occur, and, sooner or later, a stoppage will result. The main drain should be straight and laid to a regular gradient. Before breaking ground, it is necessary to strain a line on the surface over the intended site of the drain. By so doing, when the bottom of trench is reached, there will be no need to cut under at different parts of the trench in order that the line may strain clear of the sides. The width of trench should not be less than 2in.

The trench being excavated to its approximate depth, the next thing is to fix an interceptor, for from this we must determine the fall. Before fixing the interceptor, that part of the drain that connects the trap to sewer must be tested for clearness by passing rods through. In fixing the interceptor don't fix it at a dead level, but with a slight fall to sewer; it assists in passing solid matter quicker through the trap.

From the inlet of this trap we now take our fall for the main drain, which should be about 1 in 40, or 1½in. in 5ft. Sometimes, however, there is only just sufficient depth from the trap to the upper end of drain for a slight fall, and this has to be evenly distributed throughout the length of drain. To know how much we have for a fall we must take a level along the surface of ground from the point above the trap to the upper end of drain, measure down from level to bottom of drain at upper end. Deduct the depths of upper end from the depth at lower end, and the remainder will give the amount of available fall. For example suppose the interceptor is 3ft. below surface, and allow 1ft. below surface at upper end, and the length of drain is 100ft., then 3ft. — 1ft. = 2ft., thus we have 2ft. fall. Now, 100ft ÷ 2ft. gives us 1½in. in 6ft. 3in. Now, get a straight edge 6ft. 3in. long, nailing on one end a piece of board 1½in. thick, and place this end level with the lower part of inlet of the trap, and at the other end you drive a peg in the middle of trench so that the straight edge can rest upon it. By noting when level will be the proper height of first peg. Continue throughout the length of drain, the pegs standing 4ft. 6in. above the bottom of trench for concrete. The branch drains need not be of the same gradient as the main drain. They generally come up sharper from the junction to the gully or fixture. The proper way to determine the fall is by fixing the gully temporarily in its proper position, also the junction with its branch inlet well above the bottom of trench. A line or straight edge from inlet of junction to outlet of gully will be the gradient level for concrete.

CONCRETE.

Concrete is next laid in to level of pegs —in fact, ruled off to top of pegs, so that the pipes, when laid, shall be even on the top. When the concrete is set, the next thing is to drive a long chisel by the side of the interceptor and another at the upper end of drain; then strain a line from these two points at the height of centre of sockets. All is now ready for laying the pipes, the most important part of which is making the joints.

In making and finishing joints I proceed as follows: Tap each pipe for soundness before laying, rake out a little concrete near the joint of pipe so that the hand can be got well under the socket; fill in the socket of pipe with cement all round flush with the bore of the pipe; then insert the spigot end, forcing it well against the shoulder of the socket, causing the cement to fill out the joint in every part. Do not finish the joint at once, but proceed to lay another pipe, taking care that the inside of pipe is cleared after making every joint. By the time the second pipe is in position the first joint will be getting stiff; fall back on this joint, and form a ring of cement well sloped all round it. Lay a third pipe, and then finish off the first joint by "ironing" it well with the trowel, leaving it neat and clean. In fixing a gully or closed trap you cannot clean the inside of joint as in a straight pipe; you must either make the joint from the outside, caulking it first, or a ball made of rag with string attached must first be inserted in the drain before fixing the trap. The joint is then made in the usual manner, taking care that the end of the string is placed in the trap before fixing, so that the rag ball can be pulled through the trap at the completion of joint, clearing away any superfluous cement inside. Sometimes under the floor of house a joint will come just where it is awkward to get at. To get over this, take two pipes, placing one in the other vertically, and make the joint in this upright position. When the joint is hard, the two pipes can be laid as one, only sufficient cement to be gauged for one joint at the time, and it is as well to test the cement in the bag by thrusting your bare arm into it. It should be comfortably warm.

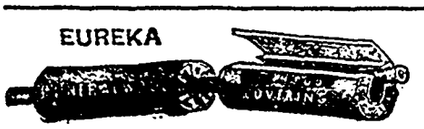
In some cases the joints are first caulked with gasket, and the cement added afterwards, but generally and, I think, preferably, the joints are made with cement alone for this reason. The sockets are about 1¼in. in depth and in inserting the gasket the depths becomes less, with a corresponding reduction in the volume of cement when added, and should there be a long run of 6in. main drain with a good fall, when the water test is applied you have a pressure of a ton or more forcing the joints. Now, by using cement alone, and in the way I have described, a butt joint is formed in the socket of each pipe, so that when the water is applied it does not penetrate the joint beyond the bore of pipe, thus reducing the pressure in each joint considerably.

Manholes and inspection chambers are now generally constructed in a new system of drainage. Should there be a manhole in front, or where the interceptor is fixed, and no inspection chamber at the back of house, it is best to continue the main drain to the surface of ground, with an easy bend for clearing purposes, fixing a stone on the top.

The drain completed, the next thing is to test it by fixing a stopper at the interceptor, or the first pipe if in a manhole, and filling the drain with water. Should the branch inlets be sealed off, a difficulty will arise. You pour in a pail or so of water, and all at once the water rises in the gully to the top, and there remains. This is a good sign, and shows that the drain is air and watertight, and is brought about by the fact that the air that was in the drain previously to changing cannot escape, so the water remains constant in the gully. In order to charge the drain one of the branch inlets must be unsealed, or a piece of compo pipe, bent so as to pass the water seal in the gully, must be inserted. This allows the air to escape. The drain being found correct and the pipes covered with concrete, the next thing is filling in. I never use a rammer; at any rate, not for the first 2ft. or 3ft., for it stands to reason that though the soil may be moderately fine, yet the weight of rammer coming over joints conveys a force on the pipes which, I think, is best avoided. Use water for filling in lower part of trench.

A few words in reference to the iron covers of manholes and inspection chambers may not be out of place. Always treat the cover as a trap for practically that is what it is or should be, in order to prevent the smell of drain escaping, and possibly find its way into the dwelling. The manhole, as a rule, is built outside the house, so that the cover is trapped by rain or other surface water; but when the manhole is inside, the groove or channel in the frame must be filled with soft soap, or oil, or sand, &c., in order to form a permanent seal when the cover is laid on. There must be a fresh air inlet at the lower end of drain and an outlet at upper. Outlet is generally taken off a soil pipe, and continued up the building clear of windows.

TO SILVER GLASS.— Have melted half an ounce of lead and half an ounce of fine tin in an iron ladle; add half an ounce of bismuth whilst in fusion, and before the composition cools add five ounces of quicksilver.



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