

Talks on Plumbing. MANY times the plumber is put to his wits' end when making repairs or putting new work into old buildings.

Frequently injured pipes and other fixtures that never give satisfaction have been so placed that they are continually out of order, and no amount of repairs can ever make them give entire satisfaction. Misplacement, in fact, is the most common cause of the mischief. An undue exposure to cold, or a too close fitting to range or stove, or else being placed where they are subject to jars or violence, are the most prevalent causes of pipe and joint disruptions. The danger from frost may be avoided by suitably disposing the pipes with relation to the heating apparatus, or by placing them at least in the farthest interior of the house. Direct contact with or close proximity to the outer wall of the building should be carefully avoided. The danger from heat comes from the common practice of crowding together hot and cold water pipes within the limits of a narrow chase or enclosure built in the house-wall. The pipes frequently get overheated and expand their legitimate dimensions, often straining the couplings and otherwise doing serious injury, causing leaks and disruptions. Into this same enclosure other pipes are often crowded, and coming in contact with lead or other pipes, injure them in process of time by mechanical pressure. It is, therefore, advisable that these chases, or recesses in the wall, should be more spacious than is ordinarily deemed necessary, or that separate provision should be made for carrying the water pipes alone. For convenience in the making of repairs, and in order that less injury to the house may be incident thereto, the chase or recess may be very fitly built upon the inner side of the walls, instead of within them, and sufficiently decorated to lessen its possibly obtrusive appearance. At all events, some provision should be made so that in case anything got wrong with the pipes, they could be got at without being obliged to cut into the wall or break through the plaster-work. In all cases where horizontal pipes are laid under the floors and across the joists, a strip of flooring over the pipe should be laid so that it can be taken up without trouble if desired. A little attention paid to matters of this kind when the plumbing work is being planned, will result in the saving of many a dollar and much inconvenience and chagrin.

Mitre Joints. THERE are "mitres and mitres," as every workman knows, and though as a general rule it is not difficult to make a good mitre joint, there are some instances that seem to baffle the best of workmen. In these cases, however, it is safe to say that it is not the mitre that is to blame, if the mitre has been cut in a true box, but the conditions. Often a mitre is made and cut to fit some angle that is not a right-angled one, and while the truth may not be discovered by the workman he may waste a great deal of time—and patience—in trying to make a fit, when a true mitre is impossible. A great deal of the rule o' thumb business is practiced on square corners that are "not square." The workman should in all cases find out if the corner into, or around, which he is to make his mitre, is square, or at right angles; if so, well and good, his mitre-box will do the rest for him if he gets his proper lengths, and if the work is of such a character that a mitre-box cannot be used, he may apply one of the many methods for obtaining the lines of a mitre, and finish his work in accordance. If

his angles are not square, then he must allow for the difference and work accordingly, which he can do satisfactorily if he possesses a fair knowledge of his trade. In the making of a perfect mitre joint, each piece should fit close to the other at all points, and not simply at the upper edge, or at the edge which meets the eye. Such a mitre as this has no strength in itself, and cannot be depended upon. It holds itself together because the moulding, or whatever the part mitred may be, is firmly fixed, and not because of any strength in the mitre itself. The larger the mitre, in case of mouldings especially, the more careful the workman ought to be in making the joint quite true at all points, so that when fixed together, the mitre may be glued, and so better able to stand and remain intact. One thing in connection with mitres the workman should never lose sight of; all the material used should be dry and well seasoned. If the wood be not quite dry, then the mitres will never remain as perfect as they should be, for no matter how well they may be made in the first instance, the shrinking and possible warping of the wood, after the work has stood for some time, upsets all calculations and destroys at once all possibilities of good and perfect workmanship being maintained, and the work becomes weakened inasmuch as the glue breaks and leaves the joint open and helpless. Sometimes, when strength is required, a "feather" may be inserted in the mitre; this may be done by making a saw-kerf in the angle and slipping in the kerf a thin piece of tough wood, smearing the piece or "feather" with glue before inserting it in the kerf. For internal angles, it is much better to "cope" than to mitre, especially so if the work relates to putting down baseboards or similar work, and in a future issue we will discuss "copeing and "scribing."

About Tools. A CARPENTER without tools is little more than a cipher, and like a cipher he must depend on his fellow-workmen for value, for standing alone he is almost worthless as a mechanic; he may handle joists, carry timber, or do the work of a laboring man, but as a mechanic he is N. G. In these days of combination tools and sash and door factories, mechanics do not need as many tools as the old-time carpenter did. It is but a few decades since a workman had to have a large chest, and sometimes two, and carry around with him enough tools to stock a modern hardware store; now all that is changed, and the best of mechanics can get along with tools that he can carry on his shoulder. In former days it was an ordinary event to see a good workman possessing tools worth from one to two hundred and fifty dollars; now fifty or sixty dollars wisely invested will supply the best of our workmen with all the tools he may ever require in his regular occupation. A mechanic needs no better recommendation than a good "kit" of tools, well kept and in good working order. It is said that "a workman is known by his chips," and it might have been better said that "a good workman is recognized by his good tools," for they tell more plainly than any written "character" or "testimonial," what their owner is. He may tell you one thing, and yet be something quite the opposite; but a look into his tool chest will betray him. A man who has worked long enough at a certain kind of work to be able to call himself skilled therein, should have acquired all the tools that are necessary, and a man who claims many years' ex-