excess must be carried as an added burden to the adjoining property or the city at large till such time as the traffic designed for actually develops. The same thing may be said in a general way about sewer and water mains and other utilities. The proposed plan does away with guesswork. The engineer would know at the outset the exact requirements of the block and would govern himself accordingly. Definiteness would characterize the whole scheme.

The smallest size commonly used for street water mains is 6-inch. This is much above the requirements for domestic purposes, but fire needs demand it. The large mains extend the whole way around a block served with water. Fig. 2 calls for a 6-inch main from the main road to the utilities tunnel only. A fire hydrant would rise from the tunnel at that point. The domestic supply could be carried by a much smaller pipe, reducing in size as it gets farther from the main. Pressure-reducing valves could be installed if necessary on the domestic supply line, conserving the pressure for fire-fighting purposes, reducing the proportion of leaks and saving much wear and tear on the whole domestic system. As the fire hydrants extend into the tunnel, frost jackets would not be required.

Maintenance

The greater portion of the cost of maintenance of a waterworks system is caused by excavations for leaks. This work is particularly costly in winter when the ground is frozen. In cold climates it is also necessary to make a daily personal inspection of fire hydrants and also to give them special attention after they have been used. This bill of expense would automatically disappear. All pipes would be open for inspection at all times and trouble would be detected at once.

Water Waste

Where sewer and water mains are laid in the same trench, leaks in water mains are very difficult to detect because they may never show at the surface. Leakage may amount to from 15 per cent. to 200 per cent., according to condition, age and pressure. Where water is pumped this is, of course, accompanied by a corresponding loss of coal or electrical energy. Detection of waste is a live issue with most municipal engineers. Cutting off waste means deferred extensions to pumping plants and equipment at a time when such are exceedingly costly. This source of expense and trouble would not be possible under the proposed system. Leaks would be detected and repaired at once without excavation.

House Connections

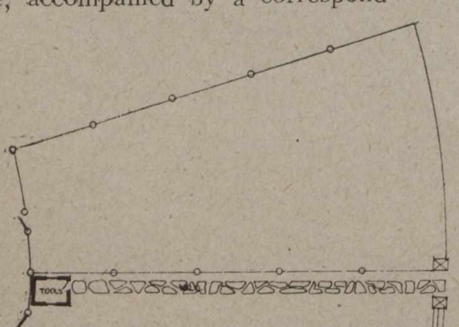
These connections carry water, sewage, electrical energy, gas and telephone service from the house to the street mains. They represent a big portion of the capital cost of housing and require much attention. They require much energy to operate them. They would be entirely unnecessary with the proposed layout.

Construction

These houses could be built to a given standard without making them identically alike and a big saving could be effected in this manner, but it is not legitimate to hold this out as an added attraction of this plan. It may be said, however, that owing to the connection of the buildings, excavation could be done with a steam shovel, effecting a saving of a substantial amount over the hand-shovelling method.

Heating

A heating authority has given it as his opinion that, with fuel at present prices, these houses could be heated at a cost of about five dollars per month for fuel. A central heating plant of the general design he proposes, could use soft coal or wood. With individual heating plants it is extremely doubtful if the same result could be obtained for less than twelve dollars per month for the winter months. The price of five dollars per month is estimated for the most severe weather.



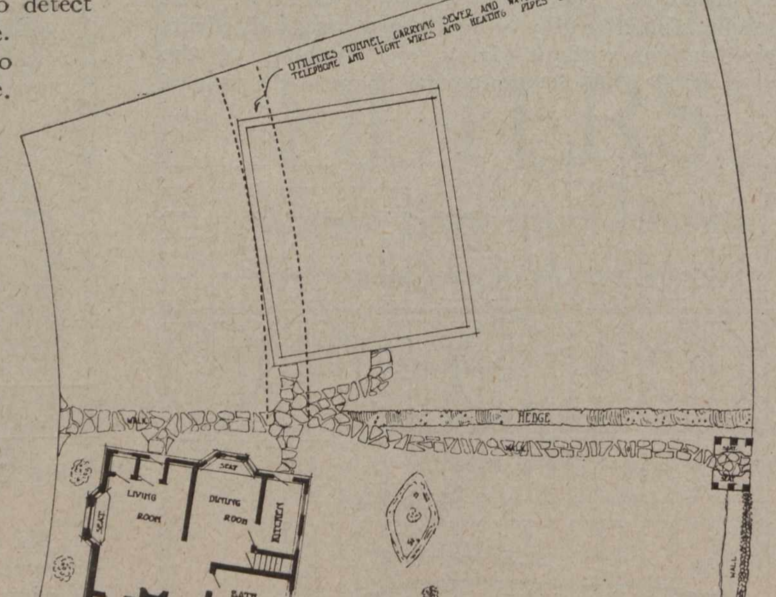


Fig. No. 3—Details of Design for One Lot, Showing Floor Plan of House, Utilities Tunnel, Walks, Hedges, Etc.