



FIGURE 16

For material heating, except for brick which are warmed with hot air, they almost exclusively use steam and hot water. It is true they use electrical heated storage bins or hoppers for hot mortar or concrete; however, most of the equipment is steam and hot water boilers using many types of fuel energy.

A part of the steam-heating appliances is the "steam lance". These lances are used for a myriad of jobs—clearing scaffolding and formwork of snow and ice, warming formwork, heating aggregate and sand piles, cleaning reinforcing steel, etc.

Enclosure.—The enclosures that are used are for the most part normal scaffolding with outriggers and extenders similar to the types that are available everywhere. The Europeans are prone to use small portable enclosures for certain critical operations. An example of one type of portable enclosure is shown in Figs. 18 and 19. This type of enclosure is especially useful for masonry bearing wall structures, as shown in Fig. 20.

Covering.—The covering materials used are not particularly exceptional. They consist of polyplastic films, canvas tarpaulins, and plastic impregnated canvas tarpaulins. The one exceptionally useful covering they do have is the plastic film-covered insulated blankets—"winter mats".

Clothes.—In the area of winter work clothes the Danes and Swedes appear to be more advanced than others. The special clothing was developed through research. It is lightweight, water and moisture repellent, allows freedom of movement, and still keeps the wearer warm and able to perform his tasks safely. An example of the Danish bricklayer outfit is shown in Fig. 22. At the present time, these outfits are relatively expensive for the workers; however, they are finding wide acceptance.

ECONOMICS

The economics of winter building in Northern Europe are not directly comparable to a similar system were it put into use in this country. It might, however, be useful to examine the relative cost for their systems and thereby gain a working knowledge of the costs involved.

It is generally estimated in most parts of Northern Europe, including Scandinavia, that the cost of winter building ranges between one-half of one per cent of the total cost of the construction and five per cent. This considerable range of cost is the result of several variables. The starting date, the duration of winter, and the size of the project are among the most important. Concerning the starting date, winter building costs can be between one-half and one and