ELECTRIC POWER IN BUILDING.

There still remain many possible fields for electrical power practically untouched. One of these is in connection with the erection of new buildings. Where mechanical power is required—for example, in working mortar mills, etc.—recourse is usually had to steam, but an electric motor would probably be found more convenient, and might also be used for driving a saw when required. It is, however, in connection with the actual building operations that the greatest saving might be obtained. For example, the bricks might be quickly raised to the level where work was in progress at a practically insignificant cost, the output of the motor not being limited by any trade union to a certain number of bricks per day. Probably the best instance of the use of electric power in building operations is recorded in a recent issue of the "Western Electrician." In the case referred to over 1,500 h.p. of electric motors is being employed in the erection of a large building in Chicago. Motors are used in making concrete, and for derricks, belt conveyors, wood-working machinery, etc., the necessary current being obtained from the street mains. Electric mains very often follow new buildings, but there would possibly be considerable benefit to all concerned if they could precede them, provided the builders could be educated to see the advantages of cheap adaptable power.

STEEL HARDENING BY ELECTRICITY.

In a recent issue of Le Genie Civil, there is described by T. Garnier a comparatively new and simple method for hardening steel by electricity. The tool to be hardened is put in electric connection with the positive pole of the battery or other source of current; in similar connection with the negative pole, there is a cast iron tank full of carbonate of potash dissolved in water. The current is regulated by a rheostat. The tool is plunged to the desired depth in the solution, just as for hardening in the usual manner; the current is then switched on and the tool heated to the same degree as would be required in ordinary hardening. When the proper temperature has been reached and held for the desired time, the current is switched off and the tool left in the bath, which latter, by the simple act of switching off the current, is at once converted into a hardening bath.

Another method, which permits of hardening places on the surface of pieces, where the dipping process would not accomplish the desired object, is local heating with the electric arc. Here the tool or other article is laid on a copper block, and an ordinary arc carbon held in a safety holder; the electric connections with holder and block being made, the carbon pole is touched to the piece to be locally hardened. Of course the heating is both intense and local; the work piece is at once plunged into the ordinary bath, and when one place is hardened the next may be heated, and so on. The electric current may also be used to draw the temper of a hollow object. Instead of using a red-hot iron rod to plunge in the bore, a cold rod is employed, which is used as a resistance in the circuit of a secondary current of about 2 volts tension. The temperature of the iron rod gradually rises, and when the work piece has reached the desired color the current is shut off. This method is said to produce less liability to cracking than the old-fashioned way of drawing the temper with a hot rod. It is particularly recommended for large hollow mills. The great advantage consists in the perfect regulation possible by means of a rheostat, and in the possibility of getting exactly the same temperature every time for similar objects, once the right heat and color are attained.—"Mining Reporter."

REFUSE DESTRUCTORS.

The refuse collected in towns from houses, shops, factories, and other places, though very variable in quality according to the conditions of the locality, always contains a certain amount of putrescible matter, says the London Engineering Times, and therefore when tipped on land is liable to become a source of disease. The deposit also of the refuse in the sea, though much less objectionable on sanitary grounds, can only be resorted to by seaside towns, or by towns conveniently connected with the sea by water carriage; and except under favorable conditions, accompanied by special precautions, this deposit is liable to be brought on to the shores by storms and tidal currents, and to create shoals, unless carried well out to sea and in deep water. Accordingly, the burning of the refuse in furnaces to get rid of the combustible portions, and to convert the remainder into innocuous clinker has been increasingly resorted to in recent years by towns for disposing of their refuse without creating a nuisance; and the clinker, if hard enough, is utilized for making mortar, bricks, paving slabs, and also in place of coke for forming bacterial beds. Mr. Vernon Harcourt, in his "Sanitary Engineering," says, with regard to refuse destructors, that originally the combustion was effected slowly with natural draught, at a temperature which was inadequate to destroy thoroughly the offensive portions of the refuse; and noxious fumes were emitted from the chimney, occasioning a nuisance; whilst the clinker obtainable was soft and unsaleable. By introducing, however, forced draught by driving air into the furnace with fans, or, where the refuse has a sufficient proportion of combustible materials to maintain a high temperature, by jets of steam converted, when exposed to great heat, into water gas by decomposition, the noxious portions of the refuse are completely consumed, the gases passing up the chimney are inoffensive, and a hard vitrified clinker is produced, with a temperature that can be maintained at 1,600 degrees F., and may rise to over 2,000 degrees F. Town refuse has been roughly estimated to consist, on the average, of one-third of combustible matter by weight, one-third of moisture, and one-third of incombustible matter converted into clinker; and though its actual composition varies considerably in different towns, there is generally a sufficient proportion of cinders in the refuse to enable its combustion to be effected at a high temperature without the addition of fuel for the purpose.