RESISTING POWER OF IRON AGAINST FIRE.

In an article in Stahl und Eisen, it is stated that the best protector for iron in the construction of buildings is cement. By exposing pieces of iron which had been interred for a long time in cement, it was proved that rust cannot assail iron so protected, provided the cement envelopes the iron round about, so that no hollow spaces exist between the iron and the coat of cement. Slag cement would not be suitable, as it contains acids. The destruction of iron and stone buildings which were supposed to be proof against fire show that they had no claim to be so considered; they often fell in shortly after the outbreak of fire. It was, however, discovered later that the collapse was due to the metal parts, which were mostly cast or wrought iron, losing their carrying power.

From this it was recognised that the iron had to be protected from the direct action of the fire, thereby preventing the loss of carrying power and expansion. The municipal government of Hamburg caused exhaustive tests to be made, identical in all respects to the conditions to be met with in a great conflagration, and these tests included cast and wrought iron and wooden supports. The supports were placed upright into an iron frame, and hydraulic pressure of about 15,000 lbs. to the square inch put on. To heat the supports a furnace lined with firebrick and provided with gas burners was used. The furnace consisted of two parts, which could be closed and opened at will, and arranged on upright shafts. The supports passed through the furnace so that a little space was left between the supports and top and bottom of furnace, and permitting the introduction of air from below and exhausting the gases of combustion above.

According as the heat was regulated faster or slower it was shown that unprotected iron supports lost their carrying power in from seventeen to fifty-nine minutes. The supports filled with mortar scarcely showed any better results, and proved again the necessity of encasing the supports by a fireproof or non-conducting material, which would delay the advance of heat to the iron, and possess sufficient strength to resist the shock of the falling debris and the stream of water thrown by a fire engine.

In the subsequent tests the supports were encased in slabs of plaster of paris, xylite, stone, wood, asbestos, or cement. The iron supports provided with such a casing retained their carrying power for as long as three hours and fifty-six minutes. An oaken support without casing withstood a similar pressure in the fire for only one hour and twenty-one minutes. The heat of the flame ranged from 1,100 to 1,300 degrees Centigrade.

MARKET CONDITIONS.

There has been an advance in the price of wire nails, and $1 75 represents the ruling figure for carloads and $1 80 for small quantities, f. o. b. Toronto. The demand is quite brisk. An increasing trade in galvanized iron is reported, and the outlook for spring trade is good. Very little is doing in cement, building paper, and glass.

In Montreal a leading feature is the continued strength in turpentine, which has made a further advance, sales of single barrels being made at 65 cents. The cement market is quiet, although steady, and the demand for firebricks is fair. Pig iron is held at firm prices, No. 1 Hamilton being quoted at from $15 to $15.50.

THE AMERICAN BOARD RULE.

The American board rule is founded upon the principle that a foot of lumber is one inch thick and 12 inches square, and that this is composed of 12 pieces one inch wide and 12 inches long. In a 12-foot board it takes a strip one inch wide the whole length of the piece to make a foot of lumber; in a 14-foot board it takes a strip the whole length of the board only 12 14 of an inch wide, and if 16 feet long only 12-16 of an inch wide, and by the same theory an inch in width in a 12-foot board, as has been stated, makes one foot of lumber; a strip an inch wide in a 14-foot board makes 14-12 of a foot, or one foot and 2-12 or ⅙ of a foot over. But as the figures on the board represent the number of feet in a board whose width corresponds with those figures, it must be seen that in a 12-inch board, as has already been stated, it takes an inch in width to make one foot, hence the figures in the 12-foot run are all exactly one inch apart on the length of the rule; but in a 14 foot board it requires only 12-14 or 6-7 of an inch in width to make a foot of lumber, hence in the 14-foot run the figures are placed 6-7 of an inch apart. In a 16-foot board it requires only 12-16 or 3-4 of an inch in width to make a foot of lumber, hence in the 14-foot run the figures on the rule are placed 6 7 of an inch apart. In a 16-foot board it requires only 12-16 or 3 4 of an inch in width to make a foot, hence in the 16 foot run the figures are only 3-4 of an inch apart. The same rule holds good in all lengths over 12 feet, but in lengths under 12 feet the rule is reversed, the spaces being wider between the figures. For instance, if the board is only 10 feet long it will require 10-12 or 1 1-5 inches in width to make one board foot, hence in the 10-foot run the figures are 1 1-5 inches apart. In the 11-foot run they must be 1 1-11 inches apart.—O. S. Whitmore, in *D.A.E.*

FILLING IN OF CRACKS IN PLASTERED WALLS.

W. A St., Cincinnati, O., writes to the Painter's Magazine that he has had trouble with filled-in cracks in an old plastered wall showing through after repainting, the spaces appearing very much darker than the rest of the surface, and desires to know whether the fault is in the paint or in the plaster used for filling in, stating that the old wall was a lavender tint, while the new color was a tint made from pure, white lead and a trifle of prussian blue with a semi-gloss finish.

The reply given is as follows: From Mr. St.'s statement it appears that he has simply cut out the cracks and filled them with a plaster of paris putty, without, however, taking the precaution to stop the suction in the new plaster with which the cracks were filled. While it is perfectly proper to fill in cut-out cracks in old walls with plaster which is mixed with a thin glue size, the plaster should, as soon as it becomes hard, be coated with white shellac varnish, or better still, fill in the shrinkage with hard glaziers putty (previously mixed with some dry lead and a trifle of good japan). This dry, sand-paper down to the level of the wall and coat the putty with paint of the color that is on the wall. Should one coat dry too flat, give another, and if necessary, still another, until the filled-in portions match the old effect. When this is done there will be no absorbtion, and consequently the old cracks will not show through after repainting. No, we do not think that the cause of the trouble was either in the plaster or in the paint, for in that case defects should have been found on the rest of the surface.