

FIREPROOFED WOOD VERSUS FIREPROOF AND RUST PROOF CONSTRUCTION OF STEEL BUILDINGS.

Those who saw the exhibits made in this city on the 19th inst., showing the extraordinary capacity of electrically fire proofed wood to resist fire must have been convinced that such wood has a future before it as an invaluable protection against fire. For constructive purposes wood has marked advantages over steel. It lends itself more readily to architectural forms, under the action of fire, even when not fire-proofed wood, maintains its shape and strength in such a way as to prevent the collapse of structures when subjected to conditions that so warp and twist metal as to render it an additional source of danger. Heat that only chars a beam of wood will draw a metal one out of place and so twist it as to disturb whatever it was placed to support and bind together. Were the entire skeleton of a building made of fire-proofed wood, such as was displayed in this city, there would be far less danger of collapse by heat than in a structure with a skeleton of steel. A frame work of fire-proofed wood would char when beat upon by flames, but would remain as rigid as when first put in position, while metal frame work under like conditions would in all probability so warp as to bring whatever it supported to ruin. But, were such fire-proofed wood used throughout a building, for joists, flooring, all other carpenter work, and for furniture and fixings, as counters, shelves, boxes, blinds, etc., the chances of a fire breaking out would be materially lessened, almost obviated, and if a fire did break out in the contents of a buildings it would not find any fuel in the structure itself. A paper on "Fire-proof and Rust-proof Construction of Steel Buildings," by Mr. Frank B. Abbott is published in the "Insurance Engineering" magazine which points out a little known danger in steel construction. He regards steel as the best building material, but it has two enemies, the greater of which, in the light of recent discoveries, it is difficult to state.

Investigations recently made by the American Society of Mechanical Engineers, as to the condition of the steel in the frames of modern office buildings, show that in many instances the metal has been seriously attacked by corrosion, and Mr. Abbott considers that, "there is little room for doubt that were the tile and terra cotta coverings removed from the steel skeletons of our great modern buildings we should find rust had set up its dangerous work in many places."

He remarks:

"Putting a covering over the metal and calling this cover fire-proofing does not insure the metal against corrosion, and sometimes, unfortunately, not against

fire. Fire and corrosion, then are the enemies of steel, the one bold, flagrant, irresistible, the other unseen, silent, insidious. Now if we can keep those two enemies at bay we have a perfect and enduring building."

Just so! If a fire does not break out in a building which has a steel frame work it will remain perfect and enduring. What is meant by a fireproof building, however, is not one that will remain intact and will endure, if not attacked by fire, but, a fire-proof structure implies one that will resist fire, that will prevent a fire spreading, that will endure and remain perfect even under the assault of fire. If then the "enduring" quality of the steel structure is dependent upon its immunity from fire it cannot be ranked as fireproof. Here is manifest the superior claims of fire-proofed wood as structural material. Fire is its enemy, as it is of steel, but it does not succumb when attacked as readily as does steel, and if fire-proofed wood has been exclusively used in a building the development of fire is at once checked, the enemy is, as it were, placed *hors de combat* at the opening of the battle.

Mr. Abbott affirms that:

"In any building during a fire, the point most fiercely assailed is the floor construction directly above the flames, and the fierce heat generated in burning buildings is caused by the floors burning away, and allowing a draught through several stories."

Now, is it not reasonable to apply the greatest fire protection to "the point most fiercely assailed," when a fire breaks out? That point, says the author of this valuable paper before us, who is manifestly an expert, is wooden floor construction. It follows, therefore, that if floors were laid in fire-proofed wood, which is the point of greatest danger, "the point most fiercely assailed" by fire, the most dangerous condition existing in a building during a fire would be so protected as to reduce the danger to a minimum, if it did not wholly disappear. Mr. Abbott says:

"A fire-proofing material, of whatever kind it may be, to properly perform its work, must entirely cover the metal on every side, wholly envelop it, and be of such nature and thickness as will prevent the transmission of heat. This being so, it follows that, if this fire-proofing material has the further quality of being impervious to air or moisture we can then successfully resist fire and rust which are two enemies of steel in buildings with one material."

That is not complimentary to steel as a fireproof material, for it explains that in order for steel to resist fire and rust it must be covered with some material which is "impervious to air or moisture." Now concrete is, as Mr. Abbott says, a material of this class, but concrete subjected to great heat shells off, and the covering is broken up by the warping of the