

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH AND FIRE OFFICES' COMMITTEE
JOINT FIRE RESEARCH ORGANIZATION

This report has not been published and should be considered as confidential advance information. No reference should be made to it in any publication without the written consent of the Director, Fire Research Station, Boreham Wood, Herts. (Telephone: 1341 and 1797).

FIRE HAZARD OF HEARTHES AND FIREPLACES

by

Jane M. Mather

Summary

Members of the Station related their experiences with regard to fireplaces in the home.

Fires beneath hearths and surrounds were reported. Movements in hearths and surrounds had also been noticed as had heating up of the surround and cracking of grates.

July, 1961.

Fire Research Station,
Boreham Wood,
Herts.

FIRE HAZARD OF HEARTH AND FIREPLACES

by

Jane M. Mather

A questionnaire relating to the fire hazard of hearths and fireplaces was sent to all members of the Fire Research Station. Eighty-five forms were returned. Just over 80% of the respondents had open fireplaces in the home, but their related experiences were not confined to these dwellings.

Seven cases of fire were reported, of which four had occurred under the hearth, and three behind the surround. Fourteen of the respondents had noticed movements by hearths and/or surrounds, whilst two had observed unexplained heating of the surround.

Fires under hearths

One fire had resulted from careless workmanship. An old range had been replaced by a modern fireplace smaller in size so that a gap was left between it and the hearth. Soot and ashes had fallen into this gap and the soot had ignited.

In the further three cases of fire reported timber joists beneath the hearths were either smouldering or alight. This type of fire occurrence might be expected in old houses which have been converted into flats or bed-sitting rooms so that fireplaces originally built for occasional use (as in bedrooms) are being used continuously. The concrete hearths are sometimes of poor quality, whilst the hearth timbers may be too near the fireplaces. The three fires reported appear to have arisen from this cause, and one respondent stated that similar incidents had been observed frequently in one area of London with which he was familiar.

Fires behind a surround

Each of the three fires recounted was different in character.

One was probably a chimney fire, where the heat from the chimney forced out the mantelshelf cracking the surround.

The area behind the surround and firebrick was not sealed off from the chimney, in another instance, so that soot got behind the metal surround (which became very hot blistering nearby paintwork). Resulting fires were extinguished by cups of water.

The third case occurred in Australia in a colonial-type wooden house. Mortar between the surround and wall cracked and became dislodged. The passage of hot gases through the resulting gaps heated the woodwork which ignited.

Movement in hearth and surround

The type of movement most commonly noticed by members of the Station was an apparent forward movement of the hearth away from the surround; ten instances of this were cited. One respondent stated that hearth movement, having been observed, had been successfully counteracted by fastening timber mouldings to the floor as close to the hearth as possible. In one instance quoted a gap was formed between the hearth and the surrounding floorboards, but there was no noticeable gap between hearth and fireplace: the surround, however, had moved, leaving a gap between the mantelshelf and wall.

Independent downward movement of both hearth and surround was observed in old property, probably due to settlement or distortion of the wooden joists supporting them.

In other instances cracks in the plaster around the surround had been noticed, but expansion and contraction of the surround do not appear to have caused movement in any consistent direction.

Mortar holding tiled hearths and surrounds has been observed to crack and disintegrate, making for cracked hearth tiles and loose surround tiles.

The gap behind the surround had filled up with soot in one instance, (supposedly without the occurrence of a fire; the present occupant was not using the fireplace). The supposition was that no sealing had been provided, or was inefficient, or else movement of the masonry had made the sealing ineffective. A similar situation may well have been the cause of the two observed cases of unexplained heating of the surround.

Another case involved a closed stove, where a gap appeared behind the hardwood shelf above the surround. It is surmised that there was a shrinkage of the hardwood shelf and softwood batten.

Cracks in the grate itself had also been observed by two respondents, together with the flaking away of lining from the chimney.

Conclusions

The inquiry covered no particular period and was not intended to relate to any particular statistical population. It recorded the experience of 85 respondents in an attempt to discover what structural faults in hearths and fireplaces had resulted in fire or the likelihood of fire.

From the questionnaires examined it appears that movements and cracking of hearths and surrounds occur not infrequently, but without serious consequences except when sufficient to break the seal between the fireplace or chimney and the surround. Under-hearth fires result from the ignition of timber which, under current bye-laws, should not be present in a modern hearth and, in the present inquiry, were recorded only in old houses converted into flats; it is known that Fire Brigades attend about 2000 such fires each year, however, and that not all of these are in old houses.