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FIRES ASSOCIATED WITH ELECTRICAL APPARATUS  
II Electric Blankets and Bedwarmers

by

R. E. Lustig

SUMMARY

Fires caused by electrical blankets and bedwarmers increased more than eleven-fold between 1953 (when such fires were first recorded separately by the Joint Fire Research Organization) and 1960. This increase seems to be more than proportionate to the increase in the number of appliances at risk.

This note deals with reports from Local Authority Fire Brigades of fires caused by electric blankets and bedwarmers, received as part of a general survey of all fires associated with electrical equipment between September 1957 and August 1958. In all, 329 reports of blanket and bedwarmer fires were received, including 12 fires in which 14 persons were injured, 5 of them fatally. The most common cause, accounting for 55% of all the fires, was reported as overheating not caused by overloading, which suggests a need for more stringent safety measures.

September, 1961.

Fire Research Station,  
Boreham Wood,  
Herts.

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INTRODUCTION

Since the last war there has been a marked increase in the popularity of electric blankets which has led to a comparatively new, though apparently rapidly increasing cause of fires. Prior to 1953 it had not been considered necessary to record electric blanket fires separately in the fire statistics produced by Joint Fire Research Organization, so that no information is available about such fires prior to that date, but as can be seen from Table I and figure I, fires attended by Local Authority Fire Brigades have increased more than eleven fold since then. Though little is known about the number of blankets at risk it seems most unlikely,

TABLE I

FIRES CAUSED BY ELECTRIC BLANKETS & BEDWARMERS  
United Kingdom 1953-1959

Year	Number of fires			Index 1953=100
	Blankets	Bedwarmers	Total	
1953	60	10	70	100
1954	78	18	96	137
1955	160	28	188	269
1956	220	12	232	331
1957	246	21	267	381
1958	396	20	416	594
1959	588	8	592	846
1960	768	12	780	1114

Source - Estimates based on samples of reports from  
Local Authority Fire Brigades

judging by annual delivery figures<sup>(1)</sup>, that this increased more than four-fold during the same period.

It is interesting to note that surveys carried out by the Fire Protection Association<sup>(2)</sup>, with the co-operation of some insurance companies revealed very many more fires than were reported to Fire Brigades; in 1956 the co-operating companies dealt with 2622 claims in respect of fire damage caused by electric blankets and bedwarmers. Evidently people are much more ready to make an insurance claim than to call a Fire Brigade at least where this type of fire is concerned, presumably because many of the fires are of almost insignificant proportions. From this it would appear that Fire Brigades attend rather less than 10% of the electric blanket fires.

Although estimates of the number of fires caused by electric blankets and bedwarmers have been available for some years, it was not until the special survey of all fires associated with electrical equipment between September 1957 and August 1958<sup>(3)</sup>, that any detailed analysis of these fires was possible. During the twelve months of the survey 329 fires were reported to have started in electrical blankets or bedwarmers, and it is with these that this note is concerned.

## PREMISES

As might be expected, nearly all the fires occur in private dwellings. Of the remainder, eight occurred in "clubs, hotels or restaurants" and, rather surprisingly perhaps, two each in houseboats and caravans.

## CAUSE

Fire Brigades were asked to allocate faults for the fires between user and appliance, and also to assess the actual causes of the fires. The results are summarized in Table II.

TABLE II

CAUSE OF ELECTRIC BLANKET AND BEDWARMER FIRES.  
United Kingdom, September 1957-August 1958

Cause	Allocation of fault	Fault in appliance	Fault in installing	Fault in use	Unknown	Total	
						No.	%
Heating due to bad contact		3	1	-	-	4	1.2
Heating due to defective insulation		47	9	7	4	65	19.8
Overheating (not overloading)		53	-	120	9	182	55.3
Short Circuit		24	3	8	4	39	11.9
Other and unknown		7	-	22	10	39	11.9
<b>TOTAL</b>	<b>No %</b>	<b>134 40.7</b>	<b>13 4.0</b>	<b>157 47.7</b>	<b>25 7.6</b>	<b>329 100.0</b>	<b>100.0</b>

Source:- Special reports from Local Authority  
Fire Brigades

It must be remembered, however, that the allocation of fault is largely a subjective one, and very dependent on the extent to which one expects the manufacturers to foresee and forestall possible misuse. In particular this applies to overheating which accounted for 55% of the fires (including 76% of the fires attributed to faults in use). It has been found by the Consumers' Association<sup>(4)</sup> that low wattage blankets (i.e. those with no thermostats, depending on heat dissipation for a steady temperature) are liable to exceed the 200°F British Standard safety level when folded, even if they pass the standard test. Further, the Industrial Development Department of the University of Canterbury, New Zealand<sup>(5)</sup> found that even blankets with thermostats can develop hot spots if crumpled, as when falling off a bed. They also found that the two pieces of felt specified in the British Standard<sup>(6)</sup> for testing the working temperature of blankets, do not adequately simulate a standard New Zealand bed. It is not at present known how representative of a typical British bed the felt assembly is, but if it is not adequate, it is possible that blankets which pass the British Standard might exceed the limit of 200°F in normal use.

## EXTENT OF FIRES

In general, fires caused by electric blankets did not reach any great size - only in 54 cases (17%) was any damage to structure reported and this

was often quite slight, while 17 fires were confined to the appliances.

#### CASUALTIES

However, in the case of blankets more than most other appliances, the fire need not extend very far before it injures or kills the user. Twelve of the fires in the survey resulted in fourteen casualties - five fatal and nine (including one fireman) non-fatal. Of the fatal casualties the youngest was a female invalid of 49, the others were aged 57, 69, 80 and 83. Three died of burns and two of asphyxia. In only one of these cases did the fire spread beyond the room of origin.

As might be expected, the majority of the casualties occurred at night. In fact, all but one (the fire causing the death of the invalid which occurred shortly after midday) occurred between 8 p.m. and 10 a.m., and all but three between 8 p.m. and 6 a.m. Though none of the casualties was actually reported to be sleeping it is evident from many reports that they were at least in bed with a blanket switched on.

It should be emphasized that Fire Brigades are not always called to small fires (even where casualties are involved) and consequently the above cannot be taken as a full list of fire casualties caused by blanket fires in the period of the survey.

#### TIME OF OCCURRENCE

The survey revealed, not unexpectedly, that the peak fire period for electric blankets is in the evening and the early part of the night, presumably when people switch the appliances on prior to retiring. There was a very marked drop in the number of fires after 11 p.m., which tends to suggest that a large proportion of users switch their blankets off before going to sleep. As can be seen from figure 2, there was a surprising number of blanket fires in the day-time for which there is no satisfactory explanation in the absence of more information on the utilization habits of electric blanket users.

#### CONCLUSIONS

The main conclusion that seems to stand out from the electric blanket and bedwarmers section of the 1957/8 survey is the importance of overheating, especially as a result of a fault in usage, as a cause of fire. From this it would appear that protection against overheating should be improved, possibly either by the provision of better safety devices, or in the case of blankets without thermostatic control, the reduction of the loading (watts per square foot) which, together with the amount of bedding, governs the equilibrium temperature. At present the British Standard allows a loading of 8.5 watts per square foot; this may, as the New Zealanders suggest, be too high, but only laboratory tests, coupled with a field survey to discover the amount of bedding normally used, can provide an answer.

Defective insulation, reported as the cause of 20% of the fires, also emerged as a serious hazard, particularly in view of the danger of electrocution with this type of appliance.

It has been obvious for some time that the greatest danger from electric blankets was to the people actually in the bed, particularly the old and infirm; this was borne out by the survey. This points clearly to the undesirability of sleeping with a blanket and leaving disabled people completely unattended with a blanket switched on, so long as more reliable protective devices are not available.

The conclusions are inevitably rather crude, as far more technical detail than was available would be required to make specific detailed recommendations. It is most unlikely that such detail could ever result from a field survey such as the present one, which must necessarily be concerned with broad outlines. The fine detail, when required could be etched in by laboratory examination of individual blankets on the lines of the New Zealand survey.

#### ACKNOWLEDGMENT

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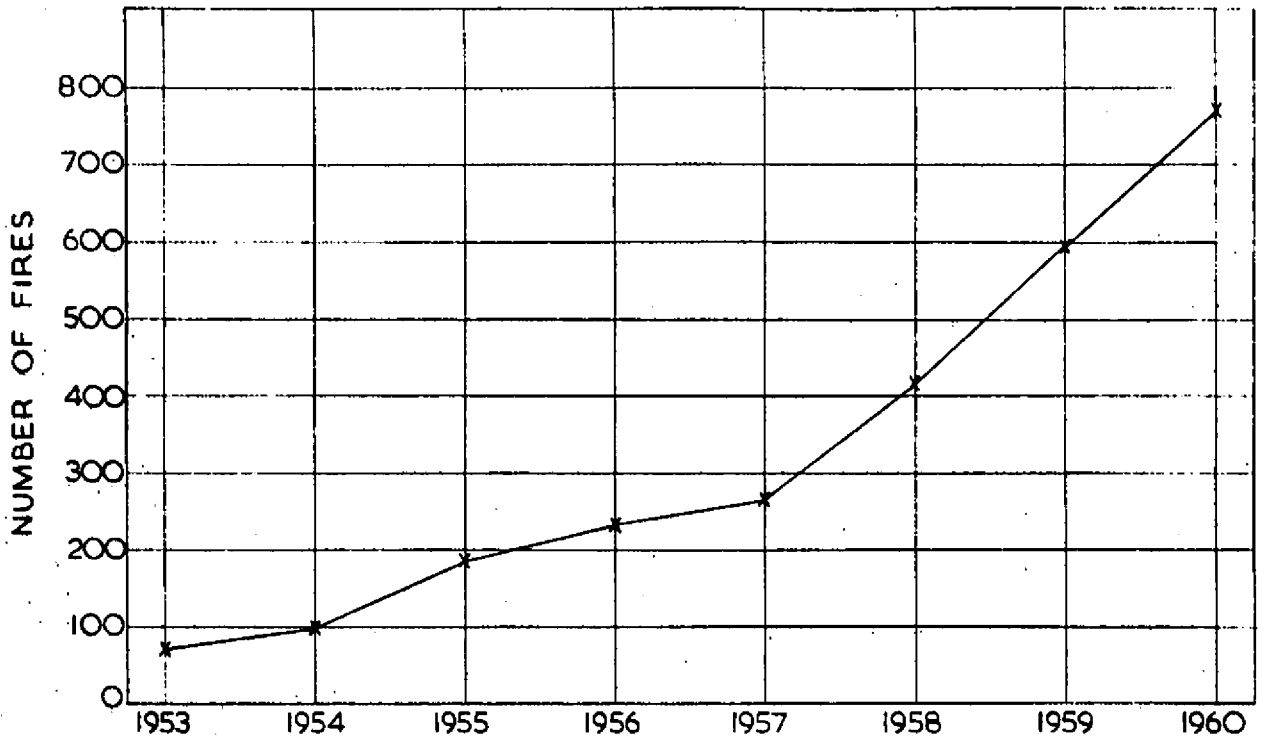


FIG. 1. ELECTRIC BLANKET AND BEDWARMER FIRES 1953 - 1960

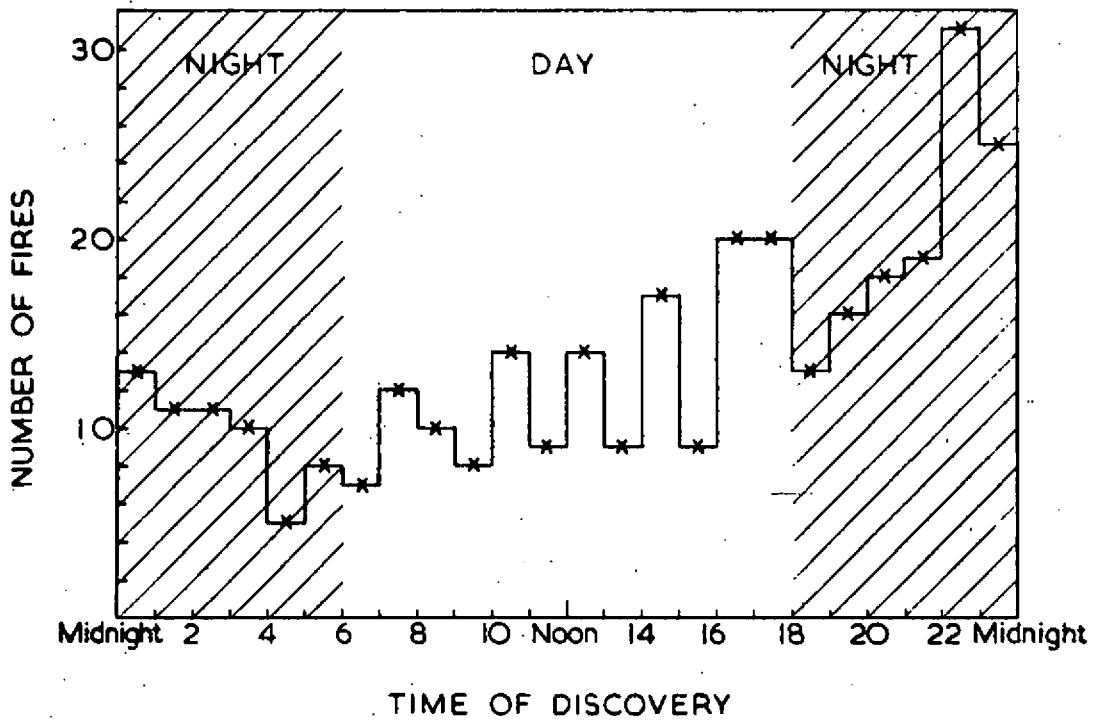


FIG. 2. FIRES IN ELECTRIC BLANKETS 1957 - 1958