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EXPLOSION AND FIRE AT A PROPANE FILLING STATION

by

F. E. T. Kingman and D. J. Rasbash

Summary

An explosion occurred at a propane filling plant, due to the leakage of propane through a broken connection to a cylinder. The storage cylinders became involved in the subsequent fire and one cylinder was projected like a rocket for a considerable distance. It was not possible to determine the source of ignition. The hazard of this process particularly in a built-up area is discussed.

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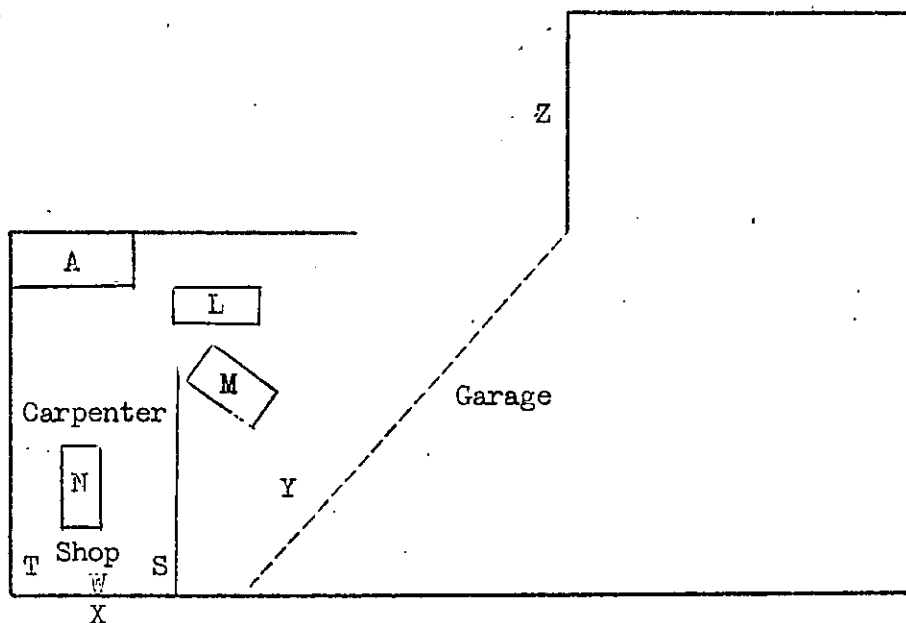
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The authors accompanied Mr. Squire of the Middlesex Fire Brigade to Messrs. Pennell Garages, Hodford Road, Golders Green on the 18th March, 1954. An explosion followed by fire had occurred there earlier in the day.



Premises and history of fire

The premises, a plan of which is shown above, were used mainly as a garage. One corner, A, however, was used for storage of propane gas cylinders and for filling small cylinders from large cylinders. A lean-to building in this corner was used as a carpenters' shop. The fire occurred while small cylinders were being filled from the large cylinders (each containing about 100 lb propane) placed on a ramp at A. The smaller cylinders were being loaded on the lorry L prior to delivery. The connection between the cylinders were by rubber hose. In some way one of these connections became detached allowing liquid propane to be discharged into the atmosphere. This formed a dense grey mist which by some means became ignited. The time lag between the leakage occurring and the ignition was sufficient to allow a man situated at about Y to smell the gas and walk to Z, a distance of about 40-50 yards. The only injury was to the man handling the refilling apparatus. In this respect it was fortunate that most of the garage workers were at breakfast and only two or three were about.

Damage

The initial explosion was followed by a fire in which many of the propane cylinders exploded and it was reported that one was propelled a distance of over 400 yards. The area round the filling ramp was extensively damaged by fire and the lorries L and M were burnt out. The roof was destroyed over the area to the left of the broken line. Lorry N was partially destroyed. Although the asbestos roof was removed in the carpenters shop there was little damage due to fire except at places S and T where a cupboard and a set of fuses were respectively heavily damaged.

by fire. Part of the asbestos roof and the supporting wooden beams were found at X indicating that the roof had been blown off in an explosion.

There was no obvious way of accounting for the isolated places of heavy fire damage at S and T. It is possible that a propane cylinder was thrown to the end of the carpenters shop and acted as a flaming torch which caused the damage. Except for a small piece of a cylinder which was recovered from nearby, no evidence could be found that this had taken place.

Ignition source

Smoking as allowed on the premises although it was reported that the man operating the filling apparatus did not smoke. At point W in the carpenters shop there was a gas heater which may have been a source of ignition but it was reported that this was not being used at the time. The two lorries L and M were said to have been cold. There were a number of fuse boxes, switches and lights etc. about the premises; none of this equipment was flame proof but it was stated that none of this equipment was in use. It may be concluded that although no definite source of ignition could be traced, there were plenty of chances for a source of ignition to be present. When the injured person recovers it may be possible to throw more light on this.

This explosion and fire has revealed the existence of a hazard due to the operation carried out on these premises which it is felt has not been sufficiently appreciated. With this operation, however carefully carried out, there must always be the possibility of escape of flammable gas which may form an explosive mixture in the premises. Any resultant explosion may have serious consequences in a built-up area, particularly if, as is likely, the other cylinders become involved in the fire. When this happens the cylinders may be projected as rockets with very serious consequences in any built-up area.

It should be appreciated that in the incident under review, the damage to life and property was very much less than might easily have occurred, and it is felt that some measure of control should be exercised over those premises where the filling of propane cylinders or similar operations are carried out, in order to eliminate the possibility of a very serious incident.