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

## NOTE ON THE SEALING OF VENTILATION LOUVRES WITH FOAM

by

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Experiments have been carried out to see if it is feasible to seal the louvres in the top of a compartment, 4 ft x 4 ft x 4 ft with foam as a means of dealing with a fire that might occur inside. The louvres consisted of six slits 3 ft. 1½ in. long x 3¼ in. wide. Each louvre contained welded baffles which resulted in a ridge down the centre and two cross partitions dividing the length into three parts, the effect being to divide the louvres into thirty-six sections. A diagrammatic section of a louvre is shown in figure 1. Because of this construction 6-point application of foam was found impracticable as a foam which was sufficiently fluid to flow over these obstructions would also flow through the louvres into the inside of the compartment much too readily. It was decided to apply the foam by thirty-six jets. The foam was applied through three lengths of ½ in. pipe with a central feed. Each length contained six pairs of holes, each pair being drilled with an included angle of about 90°. The sizes of the holes ranged from 3/32 in. diameter to 1/32 in. diameter, the sizes being graduated so as to give approximately even distribution of the foam. A diagram of this applicator is shown in figure 2. The three pipes were placed about 1½ in. above the louvres and at right angles to them.

Experiments with this arrangement have shown that about 2½ gal. of a 3 per cent solution of a protein foam compound are required to obtain good sealing using foam having an expansion factor of 7 to 8 and a critical shearing stress of 500 to 600 dynes per sq. cm. The design of the applicator could probably be arranged to give more uniform cover than at present and probably the quality of the foam could be further improved. Photographs in plate 1 show a typical application of foam. In this particular experiment the foam was applied in about one minute, this being the maximum rate of application easily obtained with the compressed-air foam-generator used. If desirable a simple generator could be designed to give a considerably higher rate of application. It is possible that the best type of generator for this purpose would be one in which the foaming solution is ejected from its container by means of a slow-burning cordite charge, the products of combustion being used to form the disperse phase of the foam. The method has already been successfully developed for other applications such as the cordite operated aircraft crash-tender; the design of the charge for this was developed by the Ministry of Supply, Armaments Research Department.

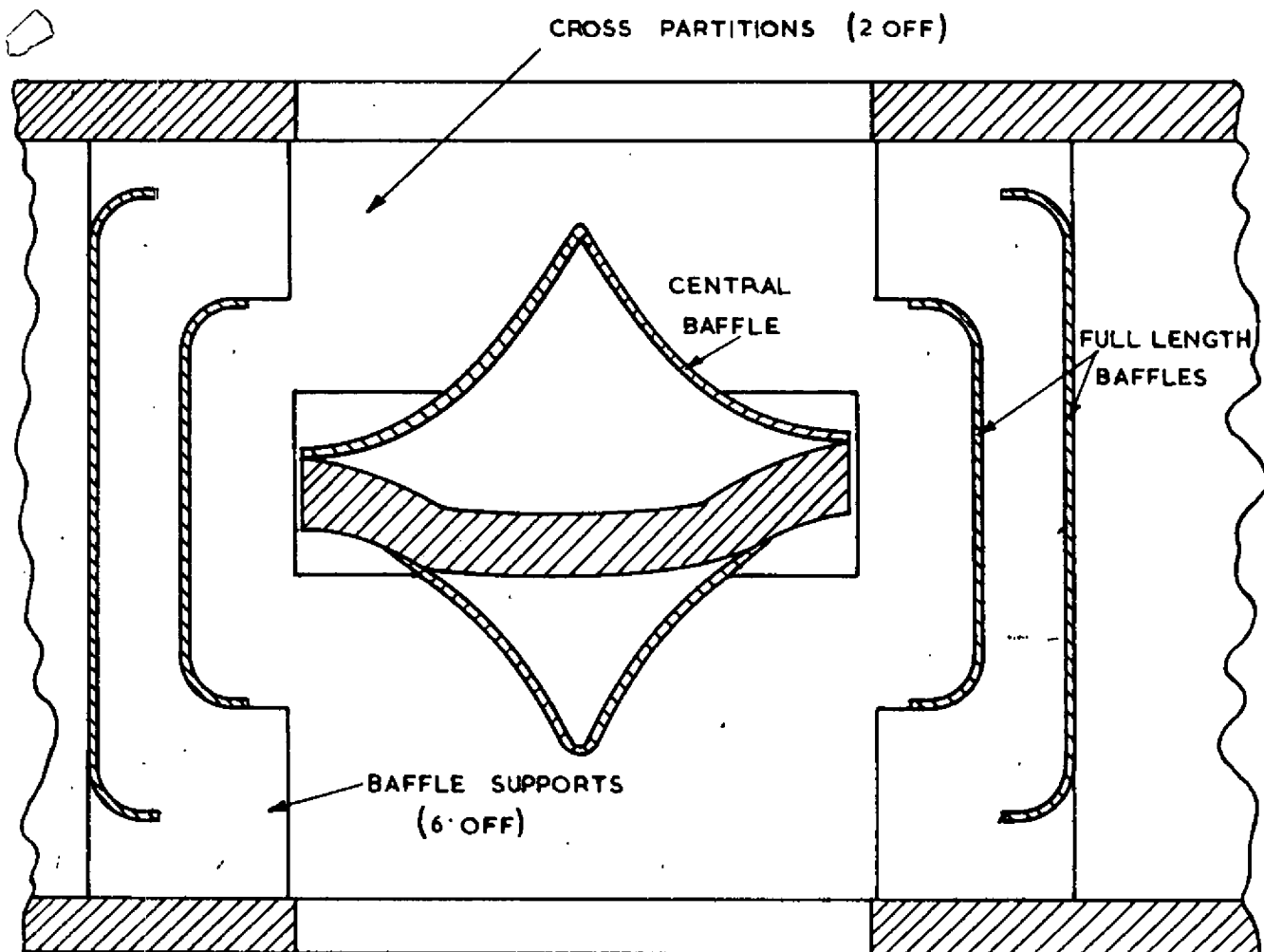


FIG.1 DIAGRAMMATIC CROSS-SECTION OF LOUVRE.

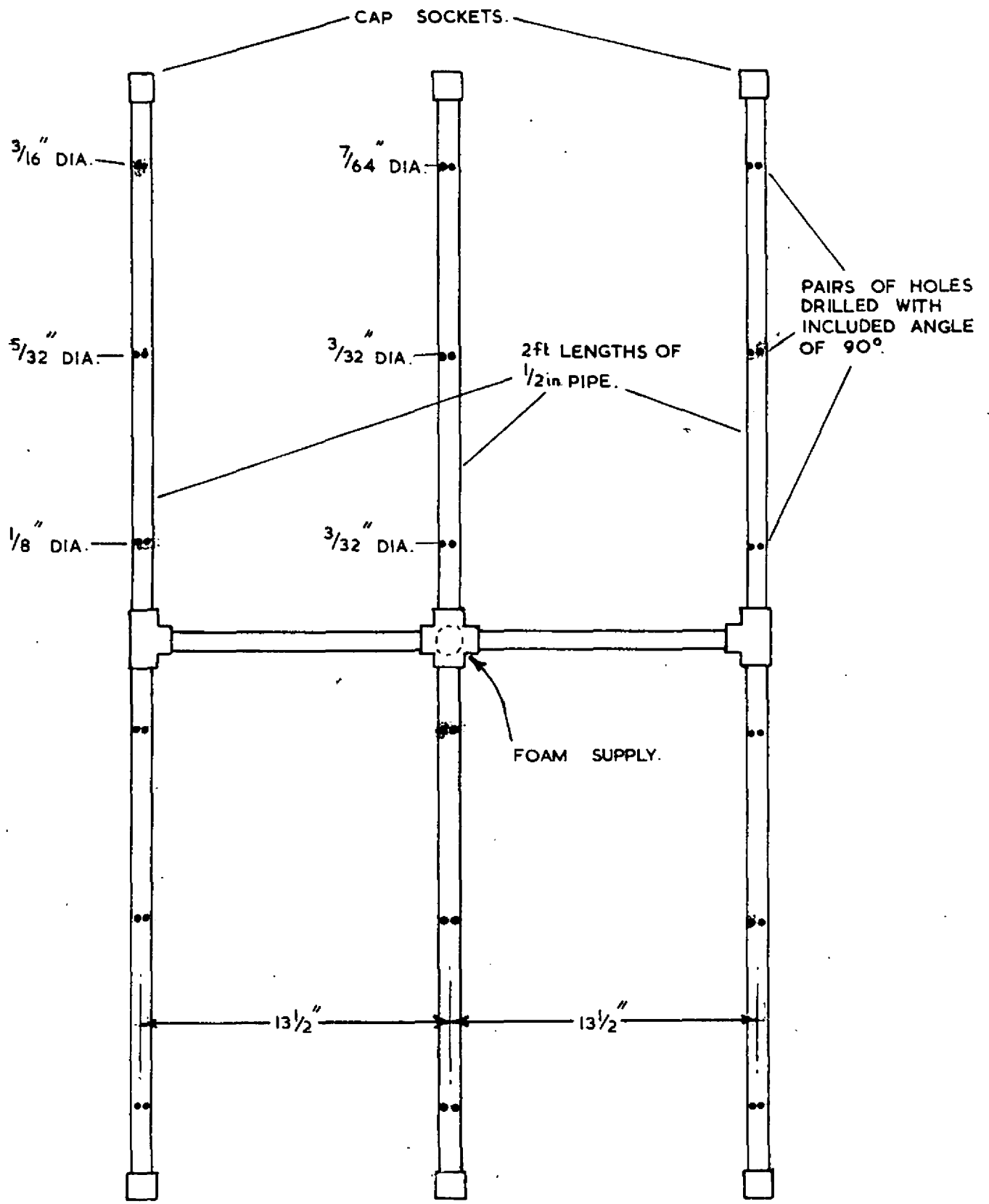
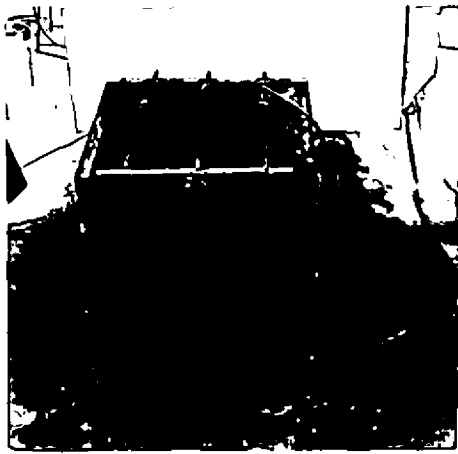


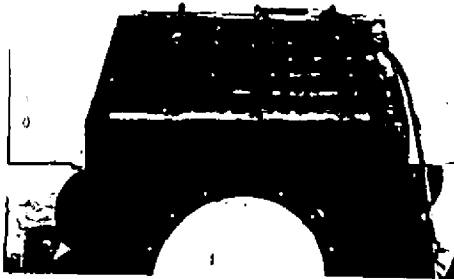
FIG. 2. DIAGRAMMATIC ARRANGEMENT OF FOAM APPLICATION PIPES.



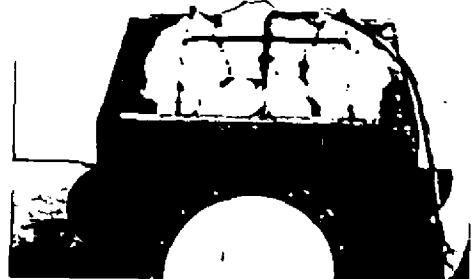
COMPARTMENT WITH APPLICATOR  
IN POSITION



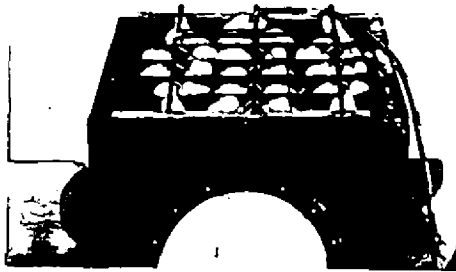
COMPARTMENT AFTER APPLICATION  
OF FOAM FOR 1min



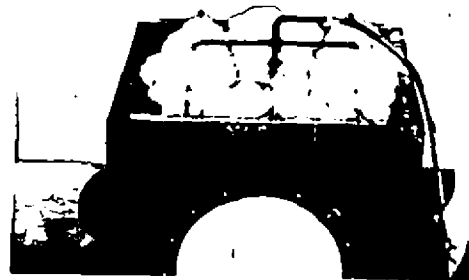
START OF FOAM APPLICATION



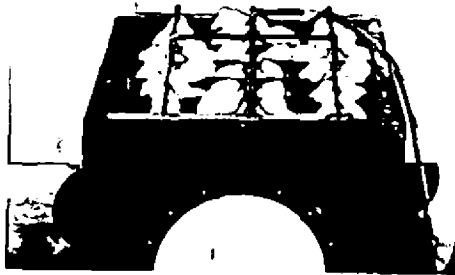
AFTER 40sec



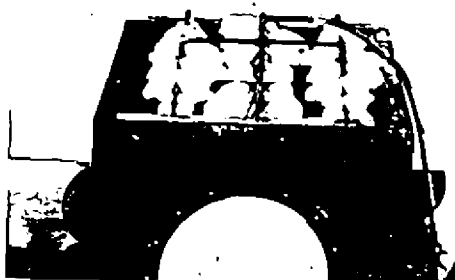
AFTER 10sec



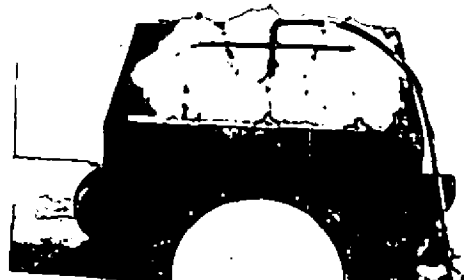
AFTER 50sec



AFTER 20sec



AFTER 30sec



AFTER 1min

PHOTOGRAPHS AT 10sec INTERVALS OF TYPICAL FOAM  
APPLICATION