Cabinet Making.

FIRE-PROOF SUBSTANCES FOR FABRICS AND WOODWORK.

As early as 1735 a patent was granted in England for "making or preparing paper, linen, canvas, and such like substances, which will neither flame or retain fire." The material employed was a mixture of alum, borax, and copperas, of which a strong solution was made, and the articles were dipped in it. From time to time other substances have been suggested, until now the difficulty is not a lack of suitable material, but rather a disposition on the part of the public to apply the knowledge which we possess. Occasionally public attention is drawn to the subject by the record of some serious accident by fire, caused too often by the igniting of clothing, curtains, or theatre scenery ; and in many directions spasmodic efforts are made to encourage or compel the application of some fire-proof material to these easy combustible substances. While there is no real opposition from those who should take these precautions, the matter of expense, and the feeling that such accidents will never happen to us, lead to neglect and soon entire forgetfulness of the subject, until brought to mind by the next serious conflagration.

The burning of the Vienna theatre has raised the question afresh as to what can be done for the protection of our private dwellings and public buildings ; and a most commendable effort is being made, both by private parties and by public officials, to introduce and encourage some protective measures.

The theory of the use of fire-proof substances for fabrics, woodwork, etc., is, to cover the combustible material with some mineral matter which shall prevent the approach of flames. It is practically impossible to render combustible material incombustible ; but it is not difficult to so protect it that it will only smoulder, and thus allow time for extinguishing the fire by other means.

The following is a list of the principal mineral substances which have been suggested, and many of which have been successfully employed for rendering fabrics and woodwork non-inflammable : Alum, borax, sulphate of iron or copperas, silicate of soda or soluble glass, sulphate and phosphate of ammonia, tungstate of soda, sulphate of magnesium, sulphate of lime, and asbestos preparations.

In 1859, at the request of Queen Victoria, Drs. Graham, Versmann and Oppenheim made an investigation to ascertain what substance is most suitable for application to fabrics to render them non-inflammable. The conditions to be fulfilled in this case are : 1st, that the salt shall not injure the strength of the fabric ; 2nd, that it shall not stain or interfere with the color ; 3rd, that it shall not leave the fabric when the latter is washed, or, if this be the case, that it shall be easily applied in the laundry ; 4th, that it shall not interfere either with the character of the finish or with the ease with which this finish is produced ; 5th, that it shall be cheap ; 6th, that it shall be efficient. No salt was found that would adhere to the fabric and bear washing without injuring the color. The salts experimented with were phosphate of ammonia, a mixture of phosphate and chloride of ammonia, sulphate of ammonia, and tungstate of soda. The phosphates, while efficient, were considered too expensive ; the sulphate of ammonia was found to act injuriously upon the iron or ironing ; but the tungstate of soda fulfilled all the conditions, and to-day is recognized as the most suitable for family use. A solution is prepared by dissolving the salt in water and diluting to a specific gravity of 1.14, and then mixed with three per cent of phosphate of soda. This latter salt is added to prevent the formation of the bitungstate, which is much less soluble than the tungstate. The goods are dipped in the solution just before starching, after which they are ironed without difficulty. In some cases the tungstate is mixed with the starch during the manufacture of the latter ; and where this preparation can be obtained it saves the trouble of making the separate tungstate solution.

The objection to most of the substances which have been recommended for application to fabrics is that they injure the fibre or leave the goods harsh to the touch. This is true of preparations containing borax, alum, or sulphate of magnesia.

In the application of fire-proof substances to wood, the conditions are more easily fulfilled; but for want of more careful investigations in this particular direction, no one substance has been decided upon as greatly superior to others, if, indeed, it could be shown that there was any material difference between several of the best.

One of the oldest fire-proof paints consists of 3 parts wood ashes, and 1 part boiled linseed oil.

Sieburger proposes to apply to the wood two coats of a hot saturated solution, of 3 parts alum and 1 part copperas. After drying, he applies a coat of dilute solution of copperas, thickened with potter's clay to the consistency of paint.

In one of the collieries of Westphalia, the following preparation has been successfully employed : 2½ parts of sal-ammoniac, 1 part of white vitriol, 2 parts of joiner's glue, 20 parts of zinc white and 30 parts of water.

Silicate of soda, or soluble glass, has been recommended. Petera employs 28 parts of the silicate in 100 parts of water. Gossage applies several coats of solution of silicate of soda, and finishes with a mixture of this solution and sufficient of common whiting to make it about as thick as ordinary paint. It is also recommended to apply to the wood three coats of a hot solution of the silicate of soda, having a strength of 25° B.

The use of soluble glass has been objected to, on account of its liability to effloresce ; but others do not find this objection, and it appears that some study is necessary to obviate the difficulty, if it really exists.

Perhaps the most promising material for application to screens and woodwork is the asbestos paint, which is being largely manufactured for this purpose. It consists of the addition of finely-divided asbestos to the liquid material of the paint.

Some experiments recently made with this paint at the Crystal Palace, London, show that it is well suited to protect from fire any inflammable material to which it may be applied. Among other experiments two miniature theatres were constructed, one of which had been painted with the asbestos preparation, and the other not. The unprotected one readily caught fire from the ignited shavings used, and in twelve minutes was in ruins ; whereas the one protected by the paint successfully resisted the flames.

The Fire Department of this city have made some experiments with the preparations of asbestos, both as paint and woven into fabric. From the statements made, it appears that the principal object sought was to have each theatre provided with a stage curtain which should keep the flames within the limits of the stage until the audience could leave the building. Doubtless the experiments had other objects in view ; but with regard to the one mentioned, we may say that it is a matter of great difficulty to make a strong fabric containing much asbestos, on account of the short and brittle fibre of this substance. Moreover, an asbestos curtain, if made, might not be kept in order, or, in case of fire, might not be lowered in time to confine the flames to the stage. The obvious remedy for any such difficulty consists in protecting the screens, woodwork, and other inflammable material about the stage, by the asbestos paint, or some other fire-proof preparation. There does not appear, at present, to be any difficulty in applying the paint, and it is certainly more reasonable to take such measures as will prevent a fire in the first place, than to provide means of doubtful practicability for confining the flames within certain limits after they are once started.—*Sanitary Engineer.*

HOW TO MAKE A SEVEN-FEET PEDESTAL PILASTER WITH THREE-PANEL BACK.

[The *Cabinet Maker* of London awarded to Mr. William Robinson of Dublin a prize of two guineas for the following description :

Having set out the work full size, proceed first to get out the top, which is a piece of inch stuff, 7ft. long, and shot to 2ft. 2in. broad. This, when finished, has a 2-inch ovolo on the top edge, and an eighth bead sunk on the face edge. Get out some ¼ inch stuff, 4½ in. wide, and line it up on the under side of the top, letting the end lining run the same way of the grain as the top. Cross line the top also over the inside ends of the pedestals : this and the back lining may be pine. Next proceed to get out the drawer frame. It will be made of inch pine, and its extreme length, with its end facings out, will be 6 ft. 5 in., and its extreme breadth from the outside of back to the front edge of the top blade will be 1 ft. 10½ in. ; the lower blade sets back 2 in. In getting out the cross rails of the frame, frame a piece of 2 in. stuff, 5 in, wide at one end, cross-ways the grain, and in putting the frame together let the flash sides of the cross rails go next the centre drawer and the outside respectively. When all is fitted, place the four cross rails