

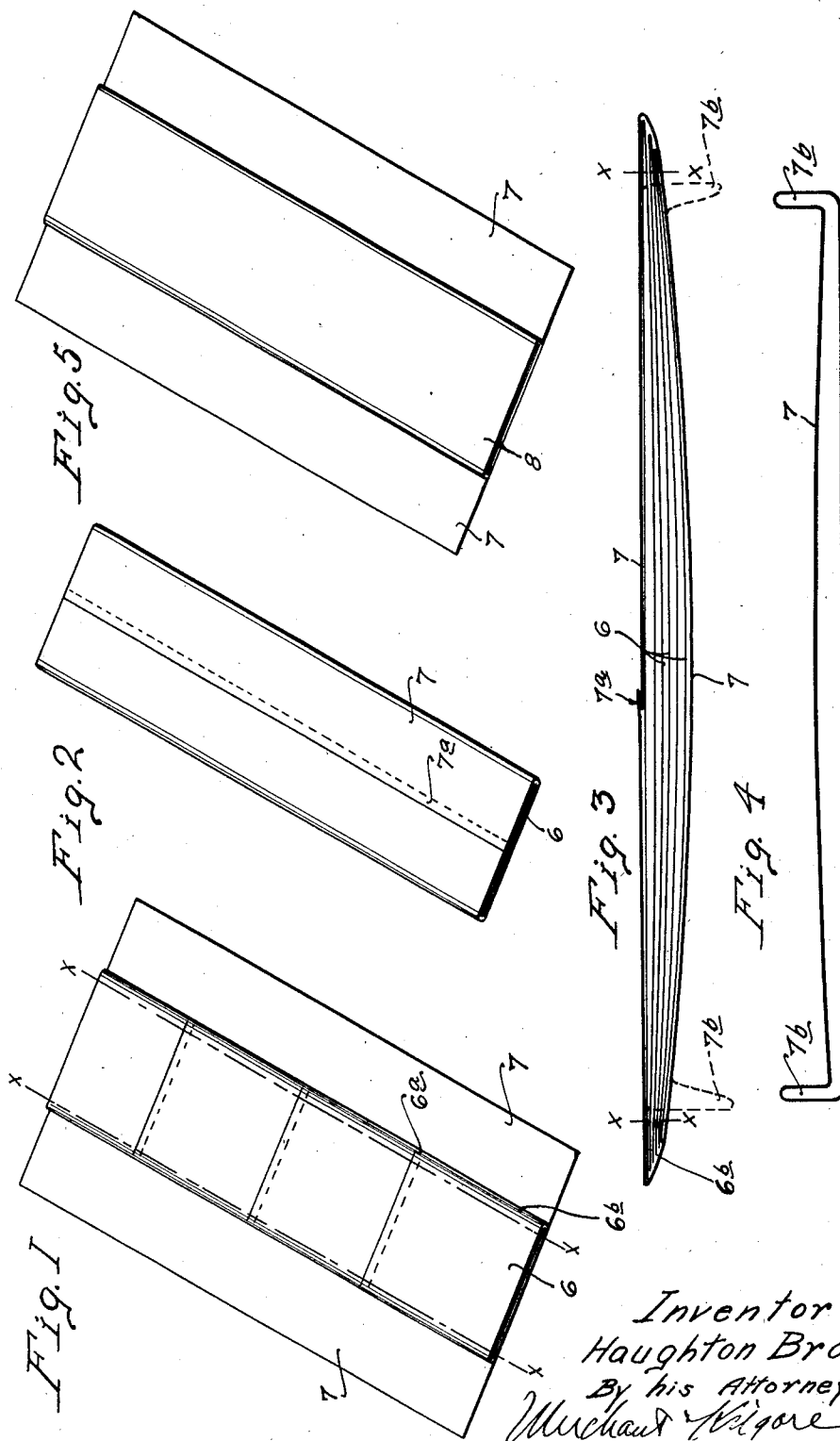
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INSULATING MATERIAL

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UNITED STATES PATENT OFFICE.

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INSULATING MATERIAL.

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My present invention provides an extremely simple and highly efficient low cost insulating material adapted to many uses such as the use thereof as a substitute for back plaster in dwellings or buildings and as an insulating body in refrigerators. The insulating material is made in the form of a quite flexible sheet. It is made up of a multiplicity of paper sheets and an enclosing casing. As an important feature, the paper sheets or filler are waste newspapers laid loosely together; and the casing will be somewhat heavier sheets of paper preferably saturated with tar or similar substances that make the same strong, tough, insect-proof and quite impervious to moisture. Waste newspapers are not only a cheap source of paper supply, but they are really better than perfectly smooth sheets for the reason that the sheets will not lie in flat close contact but will be wrinkled more or less insuring air spaces between the sheets. Moreover, as a further important feature the paper sheets which will normally be of the same width are progressively shifted at their ends so that the several sheets are given progressively greater bulge thereby preventing the sheets from lying close together and insuring the air spaces required for highest efficiency.

The invention is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a perspective showing the elements of the insulating sheets with the casing opened up or before it has been completely applied;

Fig. 2 is a perspective view showing the completed composite insulating sheets or material;

Fig. 3 is a diagrammatic edge view in which the filler-forming sheets and the casing are diagrammatically indicated by single lines;

Fig. 4 is a diagrammatic outline of the cross section of the sheets with the edges thereof turned up as required for application between the studding of a building; and

Fig. 5 is a perspective view corresponding to Fig. 1 but showing the filler-forming sheets as long strips.

Referring first to the preferred construction illustrated in Figs. 1 to 4, inclusive, the numeral 6 indicates waste newspapers laid

out flat and in bunches with the bunches overlapped at 6^a. These bunches of newspapers 6^a lapped as shown are laid on the casing forming sheets 7 with the opposite edge portions of the latter projecting on both sides thereof substantially as shown in Fig. 1. The lapped edges 6^a will preferably be stuck together with adhesive material. The opposite edges of the several sheets of newspaper 6 are progressively set inward as shown at 6^b so that the sheets are progressively given greater and greater bulge at their central portion thereby insuring the air spaces referred to above. Outward of the lines marked *x-x* on Figs. 1 and 2, the edges of the sheets 6 are secured together by adhesive material. The edges of the casing-forming sheets 7 are then turned over the filler and are overlapped at 7^a, the overlapped portions being secured together by adhesive material. By the application of the adhesive material to the sheets outward of the lines *x-x*, the said sheets are securely connected together and the adhesive material will strengthen the outer portions beyond said lines *x-x* thereby forming quite stiff marginal edges that are radially adapted to be bent on the said lines *x-x* and turned laterally at right angles, as indicated at 7^b in Fig. 4. These quite stiff edge portions 7^b are adapted to be nailed directly to the studding of a building or they may be secured by the application of lath and nails.

The insulating sheets may be of various different desired lengths and in widths required for different purposes. For the application of the insulating material between studding, the sheets will be made of such width between the lines *xx-xx* that they will snugly fit the space between the studding. It is not necessary that these insulating sheets be tightly stretched for they will be just as efficient when more or less wrinkled. The material is easily handled and very easy applied. The insulating material has very high heat insulating qualities and when made from moist newspapers it may be very cheaply produced.

The structure shown in Fig. 5 differs from that shown in the other views only in that the filler is made up of a plurality of long paper strips 8. The material made with the long paper strips 8, if new, would be very much more expensive and hardly as efficient as the cheaper structure made up of news-

papers. Some source of cheap supply of the long strips might, however, be found. The structure of Fig. 5 is therefore a modified form being the broad scope of the invention, but not the full equivalent of the cheaper structure either in point of cost or efficiency.

Tests made by the engineering department at the University of Minnesota show that this insulating material is of higher efficiency than any other insulating material known to them or on the market at present. The tests show, moreover, that per weight of paper used, waste newspaper, which will be more or less wrinkled, has higher heat-insulating efficiency than the more perfect and smooth new sheets, such as, for example, newspaper before it has been printed upon or handled and, of course, the waste newspaper is of very greatly less cost. The newspapers may be held in position in the insulating material in various different ways. The use of adhesive materials applied at the edges is preferred, but in some instances, stitching might be employed at the edges or intermediate portions or both.

What I claim is:

1. A flexible insulating sheet comprising a filler made up of a plurality of sheets of paper laid loosely together and secured at opposite edges, the sheets being of such size and so secured at their edges that they bulge progressively more and more towards the portion intermediate the secured edges, and a protecting casing shaped to permit bulging of the filler and attached to the secured edges thereof.

2. A flexible insulating sheet comprising a filler made up of a plurality of waste newspaper sheets laid loosely together and the side edges of each preceding sheet being secured slightly in advance of the edge of the next sheet so that the sheets are caused to bulge more and more towards the portion intermediate the secured side edges, and a protecting casing shaped to permit bulging of the filler and attached to the secured side edges of the sheets.

In testimony whereof I affix my signature.

HAUGHTON BROWN.