

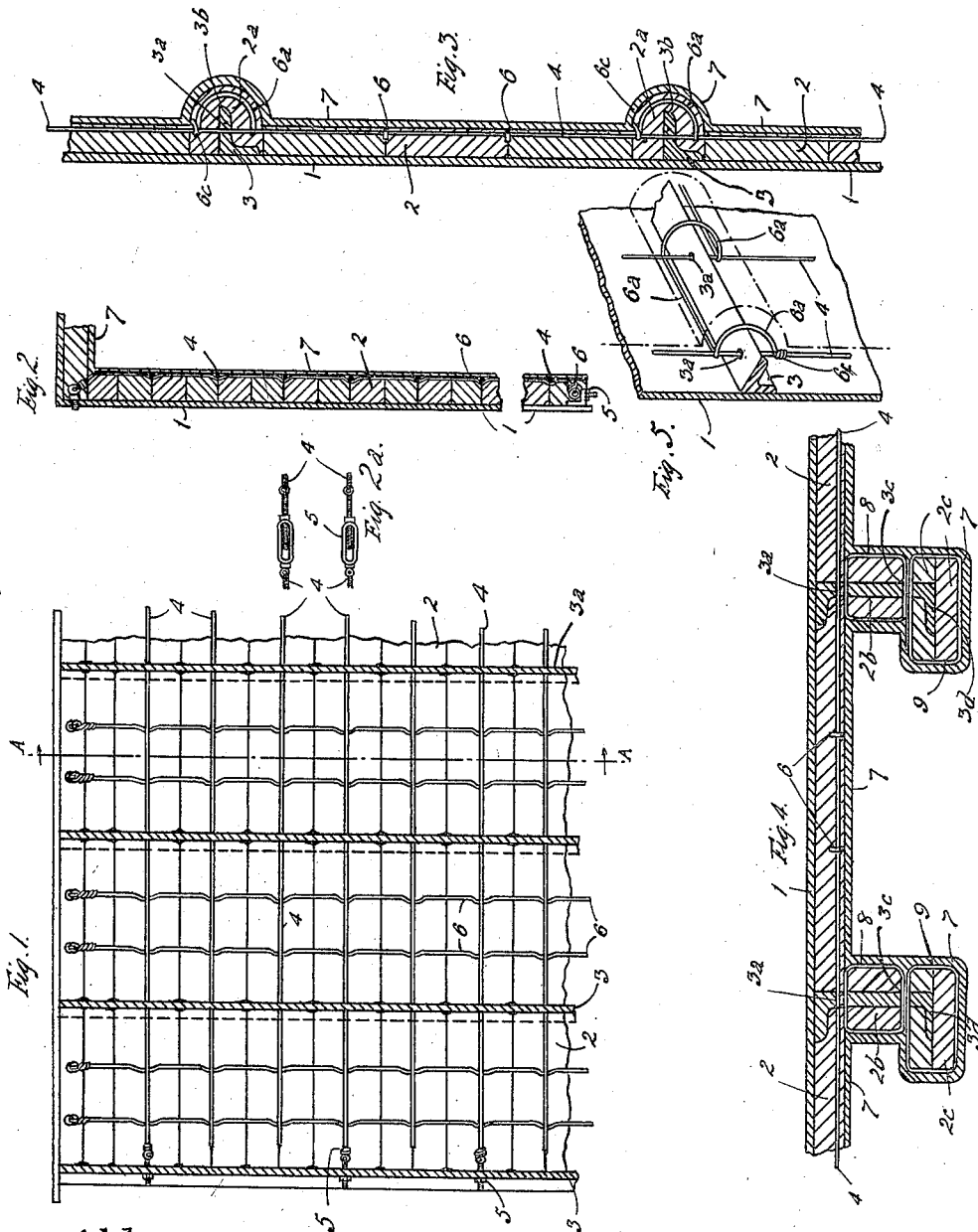
R. ANDERSON.

METHOD OF AND MEANS FOR INSULATING WALLS, CEILINGS, DECKS, BULKHEADS, OR THE
LIKE AGAINST THE CONDUCTION OF HEAT.

APPLICATION FILED NOV. 13, 1912.

1,060,056.

Patented Apr. 29, 1913.



witness.
U. S. G. Dunbar
H. E. Brady.

inventor.
Robert Anderson
By Percy H. Moore
att'y.

UNITED STATES PATENT OFFICE.

ROBERT ANDERSON, OF LIVERPOOL, ENGLAND.

METHOD OF AND MEANS FOR INSULATING WALLS, CEILINGS, DECKS, BULKHEADS,
OR THE LIKE AGAINST THE CONDUCTION OF HEAT.

1,060,056.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed November 13, 1912, Serial No. 731,172.

To all whom it may concern:

Be it known that I, ROBERT ANDERSON, a subject of the King of Great Britain, and a resident of Liverpool, England, have invented certain new and useful improvements in the method of and means for insulating walls, ceilings, decks, bulkheads, or the like against the conduction of heat, of which the following is a specification.

10 In the usual method of insulating walls, partitions, decks, or the like against the conduction of heat such as by providing a casing of sheet metal supported several inches from the surface to be insulated the sheet
15 metal being carried from the surface by means of bolts or the like and the space between the sheet metal and the surface being then filled in with some suitable insulator, a certain degree of conductivity from the
20 sheet metal casing to the surface by way of the bolts or other supporting elements cannot be eliminated. Further, when surfaces are being insulated by lining them with slabs made from magnesia or asbestos and particu-
25 larly when vertical surfaces are being so treated, owing to the fact that there is no satisfactory cement for causing such slabs to adhere to a plain surface, such as say an iron bulkhead, some mechanical form of outer
30 superficial support for the slabs is necessary. This is usually done by incasing the slabs in sheet iron, but inextensible wire netting has also been used.

35 According to this invention the surface to be insulated is covered with slabs of magnesia or asbestos which are adapted to be retained against the surface by a series of wires, preferably interlaced and capable of being adjusted in tension, a cement composition being then laid over the wires to se-
40 cure them in position and give a finish and protection to the insulation.

The invention is illustrated in the accompanying drawings, in which,

45 Figure 1, is a rear view showing the preferred method of insulating a surface, the final cement covering being removed to show the arrangement of the wires. Fig. 2, is a section of Fig. 1, on the line A—A. Fig.
50 2^a, is a detail of one means for tightening the wires. Fig. 3, is a cross section at right angles to Fig. 2, showing the method adopted for carrying out the invention when there are projecting angle irons on the surface to
55 be insulated. Fig. 4, shows another arrangement for insulating projecting channel gird-

ers with this system. Fig. 5, is a perspective view of the wiring arrangement around the projections shown in Fig. 3.

In carrying out the invention the surface
60 1 to be insulated such as a wall, ceiling, deck, bulkhead or the like, is covered with slabs 2 made from magnesia or asbestos. The slabs are preferably about six inches
65 wide or deep, though other sizes would of course be suitable, and of the required thickness for the desired insulation. On the outer surface of these slabs, remote from the partition or the like to be insulated and
70 against which they are laid is arranged a series of wires preferably interlaced and crossing, which are adapted to hold the slabs in position flat against the partition, bulkhead, or
75 other surface. These wires are arranged in the following manner: Where projections such as the angle irons 3, Figs. 1, 2, and 3, stand up from the surface to be insulated,
80 holes 3^a are drilled through the webs of the angle irons or like projection, just below the outer surface of the slabs. The slabs are disposed in layers which run transversely to
85 the angle irons, so that wires 4, when passed through the holes 3^a, may lie in certain of the junctions between the layers of slabs, and a slight distance below the outer surface of
90 the slabs according to the position of the holes 3^a, these being drilled at such a pitch that they coincide with the junctions of every other layer or so of the slabs. Means such as shown in Fig. 2^a, or to the left of
95 Fig. 1, consisting of screwed stretchers 5, or other suitable means, may be provided for tightening up the wires. The wires 4 are threaded through the holes 3^a of the angle
100 irons, and a series of transversely disposed wires 6 threaded beneath the wires 4 so as to form therewith a light yet strong distributed supporting network, capable of being
105 adjusted in tension, means such as the previously described stretchers being provided for tightening up the wires 6. When the wires 6 and 4 are tightened, the latter are
110 drawn into the junctions between the layers of the slabs 2, thus causing the wires 6 to be pulled very tightly around the exterior surface of the insulating blocks and supporting the wires 6 at short intervals thus causing the whole series of blocks to be pressed very tightly against the surface to be insulated. It will be seen that owing to the wires 4 only touching the projecting angles 3 where they pass through the holes 3^a, con-

tact between the outer retaining wires 4 and 6 and the surface to be insulated is reduced to a minimum and consequently practically no heat conductivity arises. When this manner of insulation is used in connection with the decks, walls, and partitions of ships, vessels, and the like, wood plugs may be driven into the holes 3^a after the wires are threaded to prevent wear of the wires by chafing owing to vibration. Exterior to the wires 4 and 6 a coating of cement 7 is applied consisting preferably of magnesia, asbestos, and silica, mixed with a fixing agent made from magnesite and chlorid of magnesium. This cement is put on to a thickness of about a quarter of an inch and serves to bind the wires in position against the slabs. This cement is fire and water-proof, and adheres firmly to the slabs 2, and being of a strong fibrous nature it is extremely serviceable as a protector to the insulator and the wires, and takes the place of the wood or sheet-iron protection usual in insulating methods. Consequently when this final cement covering is put on, complete insulation against any heat conduction—even that which might be attributable to the small contact of the wires with the angle irons—is entirely avoided.

Where the projecting angles stand above the normal outer surface of the slabs 2, as in Figs. 3, and 4, the projecting ribs 3^b of these angles are insulated as follows: A separate piece of insulating material 2^a, such as that for a pipe covering, is laid around the web 3^b, and additional wires 6^a carried around the exterior of the insulating pieces 2^a, one end of such wire 6^a being fastened to one of the wires 4, and the wires 6^a then laced spirally or otherwise around the material 2^a and under the wire 4 alternately along the angle 3^b, as illustrated in Fig. 5. When the wires 4 are tightened up, the insulating portion 2^a will be drawn tightly on the angle web 3^b, and held in place.

In the arrangement shown in Fig. 4, which has channel girders on the surface 1 to be insulated, another series of holes 3^c are drilled in the outer portion of the girder, the insulation around the girder being then made up in two sections, the first section 2^b between the holes in the girder and held by the wires 8 laced around the insulating slabs 2^b and passing through both holes 3^a, 3^c, and the second section 2^c, arranged around the outer element 3^a of the girder and held thereto by wires 9 passed around its periphery and through the hole 3^c.

Though the wires have been shown and described as interlaced and crossing at right angles, it is to be understood that the invention is not confined to this method, the

wires might be angularly inclined relatively, or a simple series of parallel wires provided disposed transversely to the strata 65 direction of the slabs, the wires being again provided with tension adjusting devices, and supported at intervals where required by threading them through eye bolts carried out from the surface to be insulated. 70

While the invention has been described with particular reference to methods of insulating surface having projections it would be equally applicable to surfaces with no projections, the main wires in this case corresponding to the wires 4 being tightened in any convenient manner from the ends of the surface to be insulated, the broad feature of the invention comprising the method of supporting insulating slabs or the like against a surface by means of a series of wires adjustable in tension, preferably interlaced and disposed behind the slabs or the like and covered with a final coating of cement. 85

I claim:—

1. The combination with a surface to be insulated having horizontally disposed angle beams attached thereto, the projecting portions of said beams being provided with spaced apertures, of a coating of insulating material for said surface, vertical tensioned wires passing through the apertures in said projections for holding said coating against the surface to be insulated, a second coating of insulating material adapted to cover said projections, means for holding said second coating in position, and an application of cement covering the wires and exterior surface of the insulating material. 100

2. The combination with a surface to be insulated having horizontally disposed angle beams attached thereto, the projecting portions of said beams being provided with spaced apertures, of a coating of insulating material for said surface, vertical tensioned wires passing through the apertures in said projections for holding said coating against the surface to be insulated, means for adjusting the tension of said wires, a second coating of insulating material adapted to cover said projections, a wire interlaced about said vertical wires above and below said projections for holding said second coating in position, and an application of cement covering the wires and exterior surface of the insulating material. 115

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT ANDERSON.

Witnesses:

C. J. DAVIS,
H. WILLIAMS.