Jan. 3, 1967 H. L. METZ 3,295,285

WALL REPAIR DEVICE

Filed June 26, 1964 2 Sheets-Sheet 1

Fig. 1

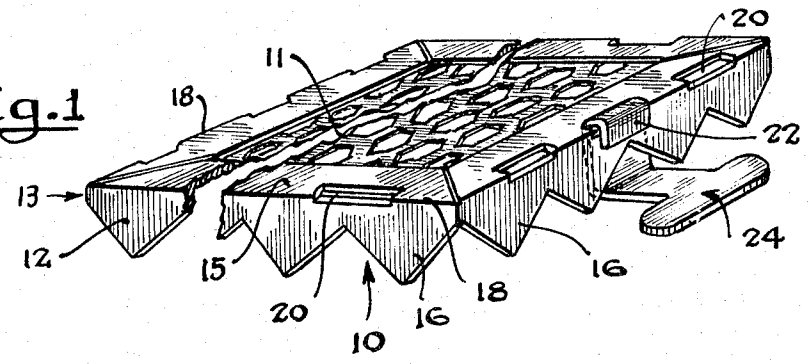



Fig. 3

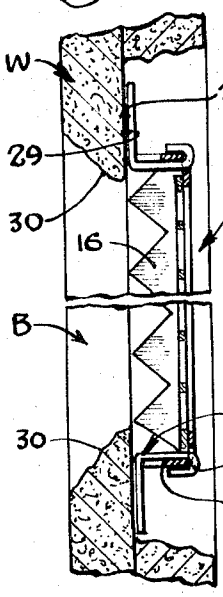



Fig. 4

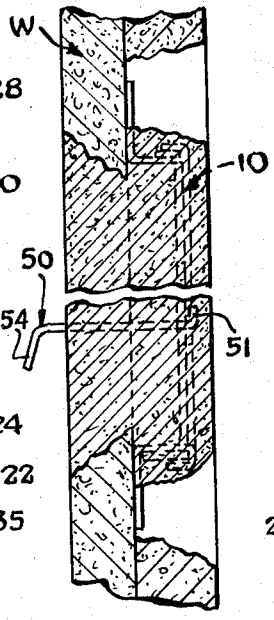



Fig. 2

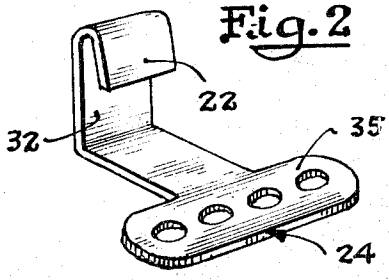
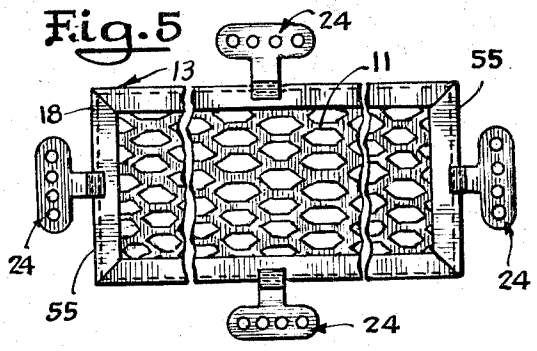



Fig. 5



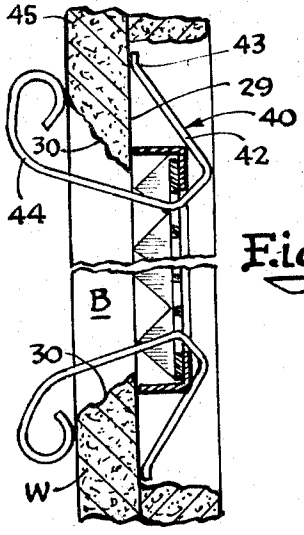
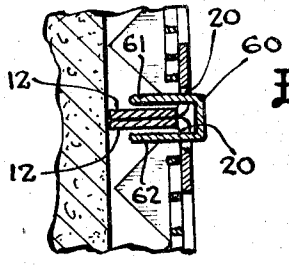




Fig. 6

Fig. 7




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Fig. 8

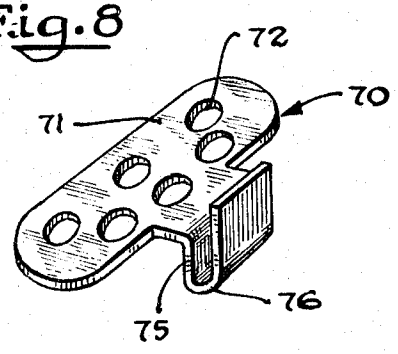
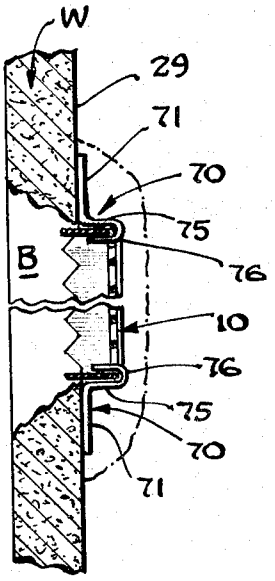



Fig. 9



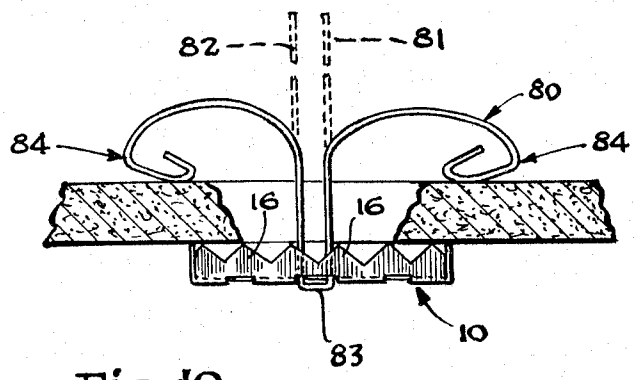




Fig. 10

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3,295,285

# WALL REPAIR DEVICE

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5 Claims. (Cl. 52—514)

This invention relates to an insert assembly to be employed in repairing breaks in plaster-type walls, concrete block, or tiles or the like, and in particular an assembly that is box-like in nature and so constructed as to retain the patching material or plaster therein while an effective bond is being made to and about the peripheries of the break in the wall.

Considerable difficulty is experienced in providing a low cost, backing insert for a patch of plaster or the like in a hole in a wall board, concrete tile or the like while the patch is being made. The plaster patch should be readily positioned in place in the break in the wall and held against displacement from the break during the extruding of the plaster about the break and insert to form plaster-keys to secure the insert and patch to the wall about the break. Accordingly, an object of the present invention is a new improved insert assembly adapted to be rigidly secured to the rear surface of the wall being patched and to support firmly the patch while it is being formed and plaster keys are being extruded about the break at the rear surface of the wall.

A more specific object of the invention is to hold an insert against the rear wall of a break by spring clamps which bias the edges of the box-like insert into tight engagement with the rear wall to support the plaster patch as it is being formed. Another object of the invention is the provision of adhesively secured hook members secured about the edge of the break at the rear surface of the wall and hooked into the box-like insert to hold the box-like insert firmly in position for receiving the patching plaster to fill the break.

Breaks occurring in building walls, concrete blocks, clay tile, and similar structures are often wide in one direction and relatively narrow in another direction. The circular inserts heretofore proposed require the dressing of the hole to approximately circular shape and to the size of the circular insert before the insert could be disposed within the wall block or tile.

As a further object of the present invention, a novel insert of generally rectangular configuration is afforded, which with a proper inserting tool, is adapted to be turned to have its narrow side inserted into the hole whereupon the insert is turned to have its longer side extend behind the shorter dimension of the hole to provide a suitable bearing surface on the insert against the rear surface of the hole without requiring the general dressing of the hole, which was heretofore required with circular inserts.

Another object of the present invention is an improved, low cost, box-like insert of rugged construction and having a base formed from expanded metal and a side wall member formed with serrations which causes the forming of plaster keys by plaster extruding through the serrations along the edges of the break at the back wall of the hole being patched.

A further object of the invention is the affording a box-like insert and attaching clips by which a number of modular inserts are secured together to form a composite and larger modular insert to accommodate relatively large holes.

Other and further objects of the present invention will be apparent from the following description and claims, and are illustrated in the accompanying drawings which, by way of illustration, shows preferred embodiments of the present invention and the principles thereof and



what is now considered to be the best mode contemplated for applying these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention.

In the drawings:

FIG. 1 is a perspective view of a box-like insert with an attaching hook attached thereto according to the preferred embodiment of the invention;

FIG. 2 is a perspective view of the attaching hook;

FIG. 3 is a sectional view showing the attaching hook secured to the rear surface of a wall and holding the insert in position;

FIG. 4 shows plaster patch formed in the insert and keyed about the edge of the hole;

FIG. 5 illustrates a number of attaching hooks secured to the box-like insert of FIG. 1;

FIG. 6 illustrates the use of spring clamps to hold the box-like insert in position at the break in the wall;

FIG. 7 illustrates a U-shaped clip securing together adjacent box-like inserts to form a modular insert;

FIG. 8 illustrates another embodiment of an attaching hook;

FIG. 9 illustrates an insert held in position by the attaching hooks of FIG. 8; and

FIG. 10 illustrates another embodiment of a spring clamp to hold the box-like insert in position at the break in the wall.

Referring now to the drawings, and more particularly to FIG. 1, there is shown a box-like insert 10 having a base 11 of expanded metal and serrated side walls 12. The insert 10 is generally rectangular in configuration, FIG. 5, which is the preferred form of the insert, although the insert could be of other shapes, as will be appreciated from the following description of the invention.

The insert 10 is a relatively low cost insert, as it consists of two low-cost elements, namely a side wall member 13 and the base 11. The base 11 is a sheet of rectangular expanded or perforated metal secured as by tack welding or the like, to the integral and inturned edges 15 of the side wall member 13, which includes both the side walls 12 and inturned edges 15. The inturned edges 15 are bent generally at right angles to each of their respective side walls 12. The side wall member 13 is preferably a single piece of sheet metal which has been punched or otherwise serrated along an outer edge thereof to create a series of points or serrations 16 to afford a serrated edge at the open side of the box-like insert 10. It will be realized that the side wall 12 can be formed with serrations of different configurations and still fall within the purview of the present invention. The other edge of the side wall member 13 is bent at right angles to form the inturned edges 15 along bend lines 18. The side wall member 13 is then bent at three spaced locations to form a rectangular box-like member into which is placed the expanded sheet metal base 11, the base 11 being of a size to overlay each of the inturned edges 15. The expanded metal base 11 is then secured to the inturned edges by back welds or by some mechanical fastening means. Formed in the inturned edges 15 adjacent the side wall member 13 are a plurality of openings 20 in the form of elongated rectangular slots. Thus, a plurality of openings 20 are formed in the base adjacent each side wall 12 at the juncture of the side wall and the base.

The openings 20 are dimensioned to receive the hook ends 22 of attachable hooks 24 which have a wide, wall engaging ear 35 adapted to be glued or secured by a suitable adhesive to the rear surface 29 of the wall W adjacent the beveled edge 30 of the break B in the wall W. The ear 35 has a plurality of apertures or holes therein through which excess adhesive may exit when the surface

28 of the ear 35 is pressed tightly into engagement with the rear surface 29 in the wall W.

The hook ends 22 of the attaching hooks 24 are inserted through the selected openings 20 in the box-like insert 10 with a riser portion 32 disposed against the interior wall of the side wall 12 of the box-like insert 10, as best seen in FIGS. 1, 3 and 4. Thus, as seen in FIG. 3, the riser portion 32 will be disposed against the interior surface of the side walls 32 and the hooked portion 22 will be disposed against the outer surface of the side wall 12. When the box-like insert 10 is in position at the break in the wall for patching material, the points or serrations 16 are in engagement with the rear surface of the wall about the break B.

In lieu of the attaching hooks 24 the embodiment of the invention illustrated in FIG. 6 employs a spring wire, holding means 40 having inner long leg 42 inserted through the serrated base 11 to bring a point 43 into contact with the rear surface 29 of the wall W. Spring holding means 40 has a medial portion extending through the break B in the wall with an inwardly curved or curled leg 44. The legs 42 and 44 in their unbiased state are separated by a distance less than that to which the legs are flexed when in the holding position shown in FIG. 6. When the holding means 40 is in a biased state, the leg 42 engaging against the rear of the box-like insert 10 exerts a holding or biasing force on the box-like insert to urge the points 16 of the serrated side walls 12 into engagement with the rear surface of the wall 29.

When inserting the spring holding means 40 in position, the points 43 of the long legs 42 are inserted through the openings in the expanded metal base 11, and the holding means 42 are rotated to bring the points 43 and 44 into engagement with the respective rear and front surfaces of the wall W. Thus, the holding means 40 provide suitable holding power to permit the plaster to be forced through the base 11 and serrated side walls 12 and to hold the box-like insert 10 firmly in position while the plaster patch dries. After the patch dries, it is but a simple matter to twist off or snip the legs 44 and apply a concealing or finished coat of patching material over the small wire tip afforded by the broken end of the wire.

Moreover, it is contemplated under the present invention that after the rough coat has dried, that the spring holding means 40 can be pulled outwardly of the wall and thereby eliminate the need for snipping off or bending in portions of the spring holding means 40 prior to application of a finished coat of plaster or patching material. The finished coat will, of course, cover the small holes afforded in the rough coat after drawing the spring clips 40 from the insert and the wall W to leave only the insert 10. The insert 10 is held in position by being keyed to the plaster patch P, which in turn is keyed to the wall W. More specifically, the entire peripheral edge 30 of the break B in the wall is dressed to form a pointed edge and to afford a triangular cross-section, FIG. 4, which is mechanically interlocked on both sides by the plaster patch material P. After the plaster patch material P hardens, the beveled edge 30 of the break B serves as a tongue inserted in a groove formed by the plaster patch material P.

In accordance with another embodiment of the invention illustrated in FIG. 4, a simple wire hook element 50 can be inserted through the break B in the wall W and the hooked end 51 of the hooked member 50 and hooked about one of the expanded metal areas 52 of the base 11 so that the hook element can be held with one hand while with the other hand an operator inserts plaster patch material into the box-like insert 10 and forces the plaster through the openings in the base 11 and the side walls 12. Thus, an operator would hold one end 54 of the hook-like wire while with the other hand the operator would be applying the patch material. After the patch was completed, the wire hook 54 could be pulled outwardly through the break and plaster patch or could be pushed inwardly so as the handle would be disposed beneath the outer surface 45 of the wall W, or alternatively, the handle could be snipped off flush with the wall surface 45 so that a finish or touching could be made thereto to conceal the end of the hook member 50.



The rectangular shape of the box-like insert, as seen in FIGS. 1 and 5, is particularly advantageous in preparing holes in rectangular cement blocks, rectangular tiles, or corners of room walls. The rectangular shape permits the insertion of the smaller dimension side 55, FIG. 5, into the opening, and the twisting or rotating of the box-like insert while behind the wall W to bring the longer side into engagement about the break B along the rear surface 29 of the wall. Heretofore, the generally circular box-like inserts, required the sizing of the hole to the shape desired, generally circular, to accommodate the diameter of the box-like insert.

Also, the present invention is particularly adapted to be readily joined with other similar box-like inserts 10 to build up a larger and composite insert. Such a larger insert would include a plurality of individual box-like inserts 10 each secured to an adjacent insert 10 by a securing means or clip 60, FIG. 7. The securing means or clips 60 are formed of U-shaped pieces of sheet metal having legs 61 and 62 adapted to be sprung apart by a pair of adjacent side walls 12 so that the legs 61 and 62 frictionally engage the side walls 12 and bias the walls 12 of the box-like inserts into tight engagement with each other. As shown in FIG. 7, the legs 61 and 62 are inserted through the openings 20 in the respective box-like inserts to engage the side walls 12 within the interior of the respective box-like inserts 10.

In this or similar manner, a plurality of the box-like inserts 10 can be secured to each other to form a modulator unit to accommodate larger breaks B in the wall W. The composite and modular receptacle can be secured by suitable attaching hooks 24 to the rear surface 29 of the wall W in the manner hereinbefore described, or alternatively, by the spring clip means 40.

In another embodiment of the invention, as illustrated in FIGS. 8 and 9, a hook or hook means 70 having a wide wall engaging ear 71 is adapted to be secured by a suitable adhesive to the rear surface 29 of a wall W about the break B in the wall is shown in FIGS. 8 and 9. The holes 72 provide suitable apertures through which the adhesive may exit when the ear 71 is pressed flat against the rear surface of the wall W. When the adhesive solidifies, it will form relatively cylindrical lugs of solid adhesive within the openings 72 to afford an additional holding against vertical or shear movement of the ears 71 relative to the plane of the rear surface of the wall W.

The attaching hook 70 is also includes a riser portion 75 bent at right angles to the ear 71 and terminates in a hook 76 adapted to be inserted into openings 20 to hold the box-like insert 12 in position, as shown in FIG. 9.

The attaching hook 70 affords an advantage over the hook-like members 24 illustrated in FIG. 2, in that the hooks 70 can be readily attached by adhesive to the rear surface 29 of the wall prior to the insertion of the box-like insert 12 through the break B and the wall W. More specifically, a number of hooks 70 are secured by adhesive to the rear surface 29 of the wall W with their hooks 76 extending with their open ends toward the break B in the wall W, as seen in FIG. 8. The box-like insert 10 is then inserted in the break B so that the hooks 76 enter into the openings 20. The hooks 70, of course, must be so positioned that the distance therebetween corresponds to the distance between openings 20 in box-like inserts 10. The plaster can then be inserted into the box-like insert 10 to key to the box-like insert through the perforated base 11. As noted hereinbefore, the plaster also keys to the wall W about the break B since the break B has been dressed to form inclined or beveled edges coming to a rearwardly extending point about the break and adjacent the insert 12. As can be readily seen, the pointed dressing

of the wall at the break affords a tongue-like cross-section which is disposed between the groove formed by the plaster patch on both sides of the pointed tongue. This tongue-in-groove effect affords additional strength in the form of a mechanical key to retain the plaster patch against displacement relative to the break B and wall W.

A further embodiment of the invention is shown in FIG. 10 wherein a single piece of flexible or spring wire holding means **80** performs the function of holding and securing the box-like insert **10** in place during the patching and during the curing of the plaster patch. Initially, the piece of spring wire is a U-shaped member with a pair of straight, vertical legs **81** and **82**, shown in dotted line with a center U-shaped portion **83** inserted through the extended metal back **11** so that the box-like insert **10** can be held while being inserted through the break B in the same manner as the hook-like member **50** was used to hold the insert as previously described in conjunction with the embodiment of FIG. 4.

After the box-like insert **10** is disposed in position, the phantom leg portions **81** and **82** are bent by a pliers or the like to form the inwardly curled portions **84** which are adapted to be spring biased against the front surface of the wall W to provide a biasing force to hold the points **16** of the serrated side walls in taut engagement with the rear surface **29** of the wall W. The inward curled portions **84** provide increased leverage to afford a stronger holding power for the riser; and additionally the inward curled portions **84** prevents snagging by workmen or other persons who might brush against the spring clip **80** during the curing process.

After the curing, the spring clip **80** can be snipped off flush with the rough coat and covered by a finished coat. A finished coat is applied to cover the snipped ends of the spring clip **80** to conceal the spring clip **80**.

From the foregoing, it will be seen that the present invention affords a low-cost and ruggedly constructed insert of improved construction which is readily adapted to be keyed to the plaster patch and to extrude plaster-keys at the rear surface of the break in the wall to hold the patch in place. Also, the present invention is readily adapted to be inserted within an opening and brought into position with its serrated edges against the rear surface of the wall by attaching means or holding means **24**, **40**, **50**, **70** or **80**.

Hence, while preferred embodiments of the invention have been described and illustrated, it is to be understood that they are capable of variation and modification.

I claim:

**1.** Apparatus for repairing a break in wall and to support patching plaster therein, said apparatus comprising an open-ended generally box-like member having one side thereof longer than another side; an expanded metal base on said box-like member to hold the patching plaster and permitting patching plaster to key in said expanded metal base; side walls serrated to points, said side walls permitting patching plaster to extrude between said points and thereby forming plaster keys against the rear surface of said wall; and expansible holding means for said box-like member having a first leg insertable through said expanded metal base and extending at an angle, said first leg engaging said expanded metal base across the rear surface thereof and having a second leg extending outwardly from said base beyond the points of said sidewalls and laterally thereof thereby adapted to extend through said break and across the edge of the break and across the front surface of said wall, said legs of said holding means being capable of being expanded from their free state when disposed, as aforesaid, to bias the serrated edges into engagement with the rear surface of said wall.

**2.** Apparatus for repairing a break in a wall and to support patching material therein, said appartus comprising an open-ended generally box-like member, said box-like member having serrated side walls adapted to extrude the patching material about thse rear surface of the wall having the break to be repaired, a perforated base in said box-like member serving to retain the patching material while permitting a portion of the patching material to extrude therethrough to provide keys of patching material to said box-like member, and a temporary holding means for holding said box-like insert in position with said serrated side walls disposed against the rear portion of said break in said wall, said temporary holding means including a flexible wire-like element having a central portion thereof hooked through the perforations in said perforated base of said box-like insert and having the end portions thereof extending outwardly of said serrated side walls adapted to pass through the break, said end portions having curved portions extending laterally of said sidewalls and terminating in inwardly curved ends adapted to be engaged with the wall so as to provide a rounded, non-snagging portion extending outwardly of the break in the wall during the curing process.

**3.** A patching insert assembly for securing to a wall about a break in wall, to support patching materials therein for repairing a wall having front and rear surfaces, said insert assembly comprising an open-ended generally box-like member having one side thereof longer than another side; a base on said box-like member to hold the patching material and being perforated to permit keying of the patching material thereto, serrated side walls secured to said base and permitting patching material to extrude through said serrations to key against the rear surface of the wall being patched, and holding means secured to said box-like member for holding said box-like member in tight engagement with the rear surface of said wall, said holding means including flexible clip elements having one end secured to said box-like member, a medial portion on each of said flexible clips extending from said one end and adapted to extend through said break in the wall, and another end portion on each of said flexible clips adapted to engage the front surface of said wall adjacent said break, said one end and said another end being capable of being flexed apart from their relaxed position and adapted to bias the serrated edges of said box-like member against the rear surface of said wall.

**4.** A modular insert assembly for receiving patching material in a hole in a wall and having a plurality of separate inserts joined together to afford a composite insert for relatively large openings in a wall; said modular insert assembly comprising a plurality of individual box-like members open at one end to receive the patching material; each of said individual box-like members including side walls having serrated edges and a perforated base, the patching material being capable of extruding from box-like member to the opposite box-like member through said serrated side walls; each of said bases having a plurality of slotted openings therein adjacent its respective side wall; securing means extending through the slotted openings in the base of two adjacent side walls of two separate inserts to hold the respectively adjacent side walls together, and holding means for holding said composite separate box-like members against the rear surface of said wall about the break in said wall, said securing means including a U-shaped clip element having legs biased to a position wherein the legs are spaced apart a distance less than the thickness of the side walls of said box-like members, said legs holding said side walls together under pressure when inserted into said openings.

**5.** A modular insert assembly for receiving patching material in a hole in a wall and having a plurality of separate inserts joined together to afford a composite insert for relatively large openings in a wall; said modular insert assembly comprising a plurality of individual box-like members open at one end to receive the patching material; each of said individual box-like members including side walls having serrated edges and a perforated base, the patching material being capable of extruding from

box-like member to the opposite box-like member through said serrated side walls; each of said bases having a plurality of slotted openings therein adjacent its respective side wall; securing means extending through the slotted openings in the base of two adjacent side walls of two separate inserts to hold the respectively adjacent side walls together, and holding means for holding said composite separate box-like members against the rear surface of the wall having the hole therein, said holding means including flexible clip elements having one end secured to said box-like member, a medial portion extending outwardly from said one end and adapted to extend through the hole in the wall and another end portion adapted to engage the front surface of the wall having the hole therein, said one end and said another end being capable of being flexed apart from their relaxed position to bias the serrated edges of said box-like member against the rear surface of the wall having the hole therein.



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