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R. J. MATHIAS

DOOR FRAME AND PLASTER BEAD

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4 Sheets-Sheet 2

Fig. 6.

Fig. 7.

Fig. 8.
This Invention relates to doorways, and concerns more particularly a unique corner or edge construction adaptable to plastered doorway openings.

For some years it has been the practice, in building construction, to use metal corner beads in connection with the plaster work. Such beads are commonly stamped from sheet metal, and their installation serves a double purpose; namely, to provide a guiding edge for the plasterer in his surfacing of walls with plaster, and to strengthen "outside" plastered corners against shock and impact by distributing stress over a larger area than the point at which it is received. The art of stamping and shaping these beads is well known, whereas a most typical installation of such corner beads is that of a plastered opening with metal beads bounding the entire edges of the opening.

Equally familiar is the mode of doorway construction. The making of door frame and doors of divers shapes and sizes is an age-old art. And most commonplace, is the doorway opening, within which a frame or batten is securely installed, and around which are attached casings of appropriate pattern. It is the object of this Invention, however, to so fashion and form an edging member, so that installed, in a rough opening, it comprises plaster beads, door jams and stop in an integral unit; and through its installation, serves an opening with a unique door frame. Other objects will be disclosed hereinafter.

In a simple embodiment of my Invention, I utilize a strip of sheet metal, perforate its longitudinal borders, and bend it along a series of parallel axes. In combination with other similar strips, and installed at either side or top, of an opening, the structural member constitutes an integral unit of corner beads, door jams and stop.

In accompanying drawings,

Figures 1 and 2 are front and side views respectively of a complete structural unit.

Figure 3, drawn at enlarged scale for clarity, represents a cross section of a vertical member at the section line 4—4 of Figure 1 or Figure 13. Figure 4 shows the same cross section as it appears in a doorway.

Figure 5 is a cross section of a modified form of structural member.

Figure 6 is a perspective view of the modification shown in Figure 5 and shows a part of a member installed in a plastered opening.

Figure 7 is a view of a doorway with a complete unit of the modification installed.

Figure 8 is a cross section of a frame and bead member with certain other modifications. Figures 9 and 10 are sectional and side elevations respectively, of a member embodying still other modifications.

Figures 11 and 12 are front and sectional views respectively of an opening with another type member construction.

Figure 13 is a front elevation of the structural member of the kind shown in Figures 1 to 4 inclusive, curved in form and adaptive to a doorway opening with a semi-circular top.

Figures 14 and 15 are views corresponding to Figures 1 and 2 respectively and show a modification in which tongues are cut for use in attaching the door frame to the doorway.

Figures 16 and 17 show the same modification with the tongues projecting as in use in wood and in brickwork respectively.

Referring to the accompanying drawings, in Figure 1, the door frame shown comprises the conventional two vertical members 10 and a top cross member 11. These members are joined by welding or otherwise at mitre joints 12. In Figure 1, it will be seen that there is a recess 13 within the entire frame of a shape and size to accommodate a door. The two closely adjacent parallel lines indicate a bead 17 which serves to retain plaster or other plastic material 16 which may be used to cover the wall, as well as to serve for the usual aligning purpose in plastering.

The door frame shown is made up of lengths of a peculiarly shaped structural member which is shown in side view in Figure 2. Such members are preferably made from light sheet steel, although other materials such as wood, plastics, aluminum or other metals may be employed.

Figure 3 is a sectional view of the particular structural member under discussion, and although drawn at enlarged scale, represents a section along line 4—4 of Figure 1 or 13. This shape may be described by saying that it presents a pair of axes crossed so as to form 90° angles or four quadrants, which I designate A, B, C and D in the order of clockwise rotation. The quadrant walls 16 between quadrants A and D and between quadrants D and C are formed by doubling over the sheet material. The outer ends of these walls present pronounced beads 17. Both with substantially straight sides with rounded ends, whereas, the quadrants A and C are thus provided with retaining shoulders.
The purpose of the beads will be appreciated by referring to Figure 4. In this figure, 18 is a door fitting into a doorway edged with the same structural member just described and as is shown in Figure 3. 15 is the plaster of the outer part of the walls while 16 is the buck or timbering member of the doorway. 20 is a base for the plasterer and may be lath or any of the prepared wall boards. These form pockets with the sides to lock the plaster in place. The rounded edges also reduce the likelihood of persons becoming injured by contact with the corners of the doorway since no sharp edge is present.

As shown in Figures 2, 3 and 4, I may perforate the planes forming the floor of quadrant A and the left wall of quadrant C with a series of holes 21. These may be omitted if desired. Their function is to allow the plaster to penetrate and harden within the folds of the walls between quadrant C and D and A and D. It is obvious that such perforation offers a firm anchorage for the plaster. Unless the walls between quadrant C and D and A and D were folded over, as shown, no space would be available for locking heads of the plaster indicated by 22 in Figure 4. However, the formation of such mushroom-like heads is rendered easy by the perforations and shape shown and all that is necessary to utilize them fully is for the plasterer to use sufficient care to see that the plaster penetrates into openings 21.

The scope of this invention is not limited to straight structural members such as have been so far described, but extends also to such members when curved, for instance, to fit doorways, whose tops are semi-circular. The appearance of a curved doorway may be seen from Figure 13 which is, in all respects, similar to Figure 1 except for the curved top thereof. The invention is intended to cover such members when curved to semi-circular or other curved shape and whether formed by bending straight members or by casting my new structural member into a curved shape. Further, the structural members depicted are within the scope of the invention whether they are cast, rolled or shaped by other processes.

No less important than the beads 17 are the flats (Figures 3 and 4) or bent (Figure 5) aligning walls or flanges 25. These enclose the corner of the jamb 18 and are nailed or screwed to the latter, hence they align the beads in the correct position to receive the door 18. I call the combination of the two flanges 23 a "saddle." As shown in Figure 3 these flanges may be flat and unperforated, in which case they are made preferably of sufficiently soft and thin metal to permit of nailing being driven through them into the jamb. In Figure 5, in which they are perforated, the holes 21 may serve either for the reception of fastening screws or they may be utilized for the locking means for the plaster. The latter is possible because the flanges 23 are channelled along the perforations to provide a "furring" strip. It is evident, therefore, that I have provided construction in which lath, plasterer board or wallboard may be used as in Figure 4, or omitted as when using the form shown in Figure 5. Either form is attached directly to the buck.

In Figures 6 and 7 it is shown how the member shown in Figure 5 is utilized in connection with plaster. In these figures, 18 is the door jamb or buck, onto which the two channelled furring strips 24 are nailed. Plasterer 16 is then pressed into the holes 21 and the wall and doorway are covered with plaster until the latter is substantially flush with beads 17. The outward appearance of a finished doorway is shown in Figure 7.

In Figure 8 a cross sectional view of a member 10 somewhat similar to that of Figure 5 is shown but which possesses the following important differences: Quadrant L is enlarged to accommodate a large and heavy door, which necessitates enlarging also quadrant J. Between the folds of the flange 16 which must absorb the force of the closing of the door, there is inserted a strip 26 of a shock or shock- and sound-absorbing material 24. Rubber is preferred but cork or linen will serve. The presence of this material suppresses much noise of the slamming of the door and diminishes the cracking of the plaster from such cause.

A second feature here shown, which may, like the shock absorbing strip, be applied to any of the modifications shown is the plaster retaining means 18. This is a row of pins or studs which may be attached to the plaster-facing side of the doubled flanges 16 in any suitable way, for example, spot welding. The plaster is intended to surround the pins or studs 26. Such devices enable the plaster to withstand greater shocks due to the slamming of heavy doors, without the plaster cracking or loosen.

Since the purpose of a doorway is to house a door, I find it advantageous to provide a hinge strap and eye 27 as an integral part of one door frame member as shown in Figure 10. A cross section thereof taken along the line 9-9 is shown in Figure 9. The hinge strap is affixed preferably by spot welding to that surface of the doubled flange 16 which forms the floor of quadrant M of Figure 9. The other quadrants N, O and P are preferably shaped as shown in Figure 9, but may be of other configuration. The hinge strap may be extensive such as in the "piano type" hinges. In Figure 9 it is to be observed that the floor of quadrant N is flat, i.e., the bead 17 is turned oppositely from that of quadrant A, Figure 3.

In order to obtain some of the benefits of my invention, it is not necessary for the structural member to be provided with beads, nor need any of the flanges be thicker than the rest or doubled over. In Figures 11 and 12, I illustrate a finished doorway made by the use of a beamless structural member according to my invention. Figure 12 is a cross section taken on the line 11-11 of Figure 11. These figures 18 is the buck, 20 are sections of composition board. My structural member here (Figure 12) comprises beamless flanges 16-16 for the reception of the door and flanges 23-23 for attachment to the corner of the buck. The cross-sectional shape created is somewhat like two adjacent pieces of "angle iron." The shape approximates two pieces of angle iron placed corner to corner but actually both have a part of one of the flanges 16 in common. Or to describe the shape in simpler terms, it is a short cross in which one vertical part is displaced somewhat to the left and the other to the right of the center. It may be provided with the attaching means previously disclosed.

Shown in Figures 14 and 15, are front and side views of a frame made of members substantially
similar to those previously described, with the exception that the members have been stamped through; creating a series of cuts 25 and 26 which are angular and U shaped respectively. By use of a punch, screw-driver or other familiar device, the material bounded by the cuts may be bent away from the adjacent member surface, thus forming sprigs, nibs or tongues of triangular or rectangular shape. These are useful in attaching the member to the corner of a rough doorway opening.

Referring to Figure 16, which is a perspective view of a section of a member attached to a wooden opening member 28, the triangular sprigs 27 and nibs 30 have been formed by bending material in angular cuts 25 of Figures 14 and 15 in such a manner that they may be driven into the timber or buck member 28, and thus serve to maintain the frame and bead member in place. The size of the sprigs 27 in these drawings is enlarged somewhat for purposes of clarity. In practice, however, smaller sprigs make it readily possible to drive them into the wood with a hammer, and by springing the frame member temporarily, no difficulty will be encountered in driving the sprigs in at the right angles shown. In this Figure 16, the frame member 25 bounded by the U cut 26 has not been bent from its original position, as such bending is not necessary here.

In Figure 17, which is a perspective view of a section of a member attached to the corner of a doorway opening of masonry units 23; the nibs 30 have been formed by bending sufficient material within cuts 26 of Figures 14 and 15 in such a manner that the nibs 30 fit directly on top of masonry units 23, where they may be embedded in the mortar of a succeeding course of masonry units. The thickness of the nibs 30 in these drawings is greater than required in practice, and is shown in such a manner only for clarity. It is not a requirement that all of the material within the U cut 26 be bent; rather a bending axis may be chosen anywhere down the face of the concrete or masonry material forming these nibs while laying succeeding courses of masonry units and have the nibs fit directly in mortar joints regardless of the length of the nibs. It is seen therefore that these nibs 30 comprise a binding means for maintaining the concrete or masonry member in place against the corner of the masonry opening. In this Figure 17, the material within cuts 25 has not been bent from its original position because such bending is not necessary here.

It is rather obvious however, that material within any one of the cuts 25 and 26 of Figures 14-17 may be bent in either direction along their bending axes; so that if desirable, some sprigs or nibs may be bent in one direction to serve as the attachment means already described; whereas others may be bent slightly in the opposite direction and thus comprise additional locking means for retaining plaster or cementitious material applied adjacent to and flush with the beads of the member as previously described.

Thus by stamping or cutting the member of my invention in a manner as described, the member is provided with means for attachment to a wood or masonry corner, or means for locking plaster or cementitious material in place adjacent to bead elements of the member; or means for both purposes in combination. It is obvious likewise that by bending either or both sprigs 27 and nibs 30 in the manner shown in Figures 16 and 17, the frame member may be placed in formwork in the conventional manner, and a concrete or other plastic material doorway opening cast with the frame and bead member being permanently held in place at the corner by sprigs 27 and nibs 30. Not only sprigs may be formed by cutting and bending, as described, from the stock forming the structural member, but the hinge elements 27 such as shown in Figure 10 may also be so formed. Such hinges are adequate to support light and medium weight doors, but for heavy ones, hinge elements spot welded to the structural members as shown in Figure 10 are preferred.

I claim as my invention:
1. A structural member adapted to installation in a door opening, a cross section of which consists of flanges defining substantially right angles with substantially common legs; said right angles respectively being adapted to receive in a doorway, a corner of the "rough" opening, a door, and beads formed of doubled-over sheet material on the outer edges of the flanges adapted to retain plastic wall surface material.
2. A structural member adapted to installation in a door opening, which member consists of four flanges defining substantially equal quadrants, two of said flanges consisting of doubled-over sheet material, a bead formed along the doubled edge, one fold of said doubled flanges being perforated to retain plaster.
3. A structural member which comprises a strip of sheet material folded upon itself and bent along a series of parallel axes to form a substantially cross shape comprising four flanges of which two of said flanges comprise doubled-over sheet material, one of said doubled flanges being of substantially greater length than the other doubled flange.
4. A structural member comprising a strip of sheet material folded upon itself to form a shape which in cross section has four quadrants, one of said quadrants being bounded by two folded-over flanges, and shock absorbing material within the folds of one of said flanges.
5. A structural member comprising a strip of sheet material folded upon itself to form a shape which in cross section has four quadrants, one of said quadrants being bounded by two folded-over flanges and, on the outer side of the doubled flanges which defines said quadrant, plaster locking means.
6. A structural member adapted to installation in a door opening a cross section of which member comprises substantially common legs defining quadrants, said quadrants being respectively adapted to housing, in a doorway, a jamb member, a jamb surface material, a door, and plastic wall surface material, and on one leg of said door housing quadrant, a hinge element.
7. In a doorway, two parallel plastic beads, a connecting element right angled in section for said beads, said beads being located as terminal on the edges of said connecting element, and means integral with said combination for attaching same to a corner of a rough doorway opening.
8. A structural door frame member comprising four longitudinal flanges of sheet metal defining four quadrants, two adjacent flanges of which each bear a continuous bead at the outer edge and the remainder of which flanges bear a series of cuts in the webs thereof the areas enclosed...
by which may be bent to form pointed nibs capable of being driven into wood.

9. A door frame member according to claim 8 in which the cuts define rectangular tongues for anchorage in brick work or the like.

10. A door stop and edging unit comprising a stop flange and an edging flange joined to accommodate a door, flanking beading integral with said flanges at the outer edges thereof, and a saddle affixed to the combination, said saddle fitting a corner of a doorway foundation member.

11. In combination with a doorway foundation member having a corner, and having corner sur-
face to be finished, a door stop and edging unit comprising a stop flange and an edging flange joined to form a door recess, flanking beading integral with said flanges at the outer edges thereof, said beading being flared away from said door recess, and means for securing the combined flanges to the foundation in a corner position in which the door recess is substantially opposite to said foundation corner and in which plastic finish composition is applied to said foundation member substantially flushed with said beading.

ROBERT J. MATHIAS.