Oct. 2, 1962 J. C. HOVELAND 3,056,159

JOINT TROWEL

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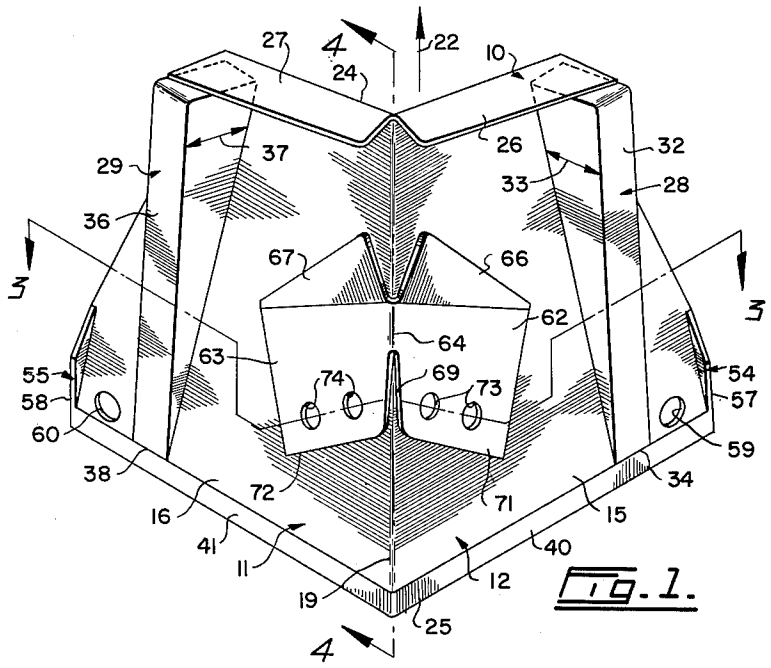


Fig. 1.

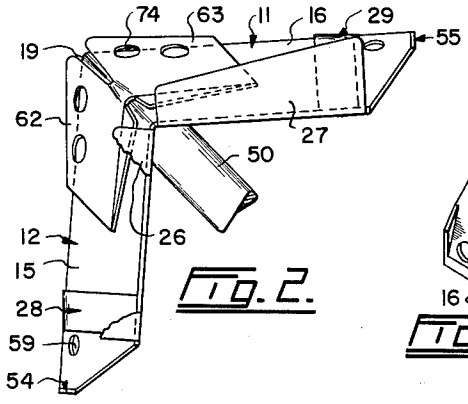


Fig. 2.

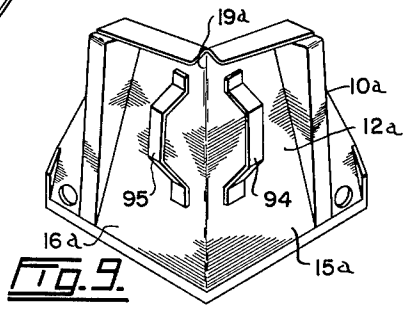


Fig. 9.

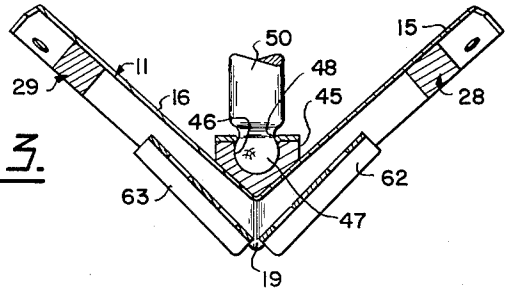


Fig. 3.

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JOINT TROWEL

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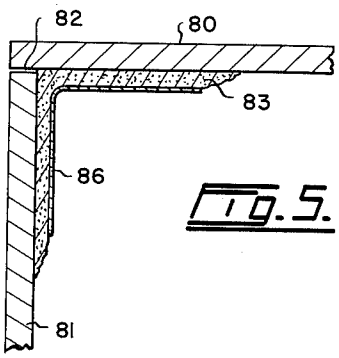


Fig. 5.

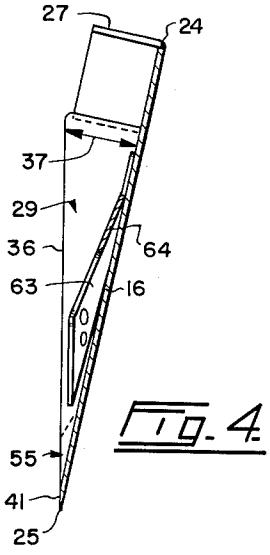


Fig. 4.

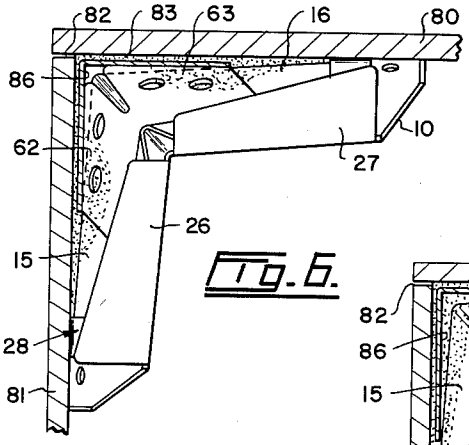


Fig. 6.

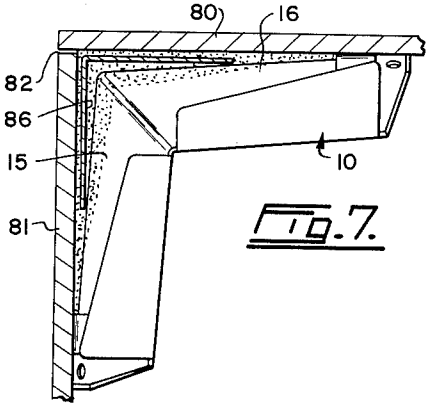


Fig. 7.

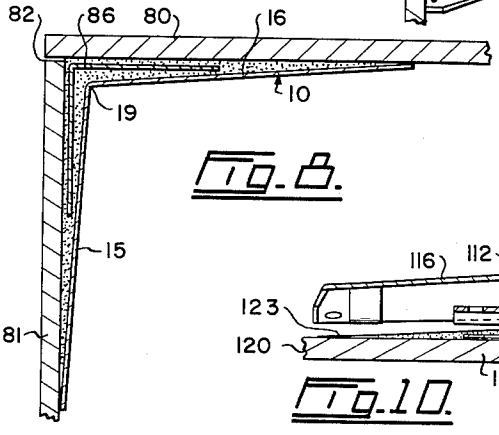


Fig. 8.

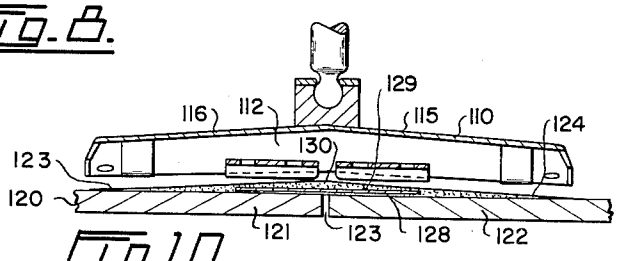


Fig. 10.

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JOINT TROWEL

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2 Claims. (Cl. 15—235.7)

This invention relates to trowels for smoothing out plastic materials or mastics over room or building joints and particularly corner joints.

In the building industry, the use of plaster on walls and ceilings has to a great extent been replaced by a dry wall construction. This consists of nailing up sheets of plaster board or the like to form walls. This leaves the problem of filling the cracks or joints between the sheets in the walls and at the corners. It is common practice to fill the joints with a mastic. An excess of the mastic is supplied at the joint, and then a tape is pressed over the joint or into the corner over the mastic. Prior to this invention, the application of the tape and final finishing of a corner joint was mainly a hand operation. As the mastic acts as an adhesive for the tape, an excess of mastic must be supplied in order to be sure that the entire tape is firmly secured to the wall over the corner. When the tape is firmly pressed into the corner, mastic exudes from beneath the tape along the edges thereof. After the tape is firmly pressed into position, a layer of mastic is supplied to the outer surface thereof, and this is trowelled laterally along the joint to form an outer surface over said mastic which merges with the adjacent wall surface. This is a long and tedious task, and requires skilled workers. In addition, it is usually necessary to clean up mastic from the walls near the corner.

The present trowel is particularly for corner joints, but it may be constructed for wall joints, and in either case, it may be in two forms or it may be convertible into two forms. For the sake of convenience, the description will deal mainly with a corner trowel. This trowel is to be used after the mastic has been inserted in the corner joint and the tape placed in the corner over the mastic. One form of this tool is then used to press the tape firmly into the corner while confining the excess mastic pressed from beneath the tape to the corner area where it is needed. In fact, this trowel directs the excess mastic back over the outer surface of the tape and presses it into the final form. If enough mastic material has been applied in the first place, the one movement of the trowel over the tape may be sufficient to complete the job. The tool trowels this mastic from the corner laterally to cause the outer surface of the finished mastic to merge with adjacent wall surfaces. On the other hand, it may be preferred not to apply sufficient mastic or there may not be enough mastic for the whole job in the first place. In this case, either an alternative trowel is used, or the original trowel is converted into a tool ready for the final operation. Additional mastic is placed over the tape, and then the trowel is moved over said mastic. This action tapers the mastic laterally down to the outer surfaces of the walls, while leaving a suitable thickness of mastic over the tape.

If desired, the tape may be pressed into the corner by hand or by some other tool, and the corner trowel referred to in the second stage of the above operation may be used to flatten out and smooth the final coating of mastic. Furthermore, the corner trowel is designed to fit accurately in a wall corner and to travel straight along said corner, thereby eliminating the necessity of having a specially trained operator.

A joint trowel according to the present invention comprises a plow when designed for a corner joint is formed with a substantially V-shaped outer working surface and has a longitudinal nose along the apex of the V. A pair of runners are provided along the working surface, one

on each side of and spaced laterally from the longitudinal nose. These runners have outer longitudinal surfaces starting at the working surface of the plow near one end thereof and sloping away from said surface towards the opposite end of the plow. As most corners are in the form of a 90° V, the V of the working surface of this plow usually is a little greater than 90° so that when inserted into a corner, the longitudinal nose is spaced from the bottom of the corner while the working surface of the plow spreads laterally from said nose to the adjacent walls. In other words, the angle of the working surface is always a little larger than the angle of the corner for which the tool is designed. The runners keep the forward end, with respect to the direction of movement of the trowel, spaced upwardly from the walls forming the corner, but the sloping surfaces of said runners permit the opposite end of the working surface at the outer edges thereof to engage the walls.

The tool described immediately above may be used alone for the finishing operation. On the other hand, it may also be used for the tape-pressing operation. In this case, two pressure plates are permanently or removably mounted side by side on the working surface of the plow spaced inwardly from the runners and meet along the longitudinal nose. These pressure plates are inclined outwardly from the plow working surface in a direction towards the end of the plow where the longitudinal surface of the runners start at said working surface. In other words, the incline of these plates is opposite to the incline of the outer longitudinal surface of the runners.

When the tool is constructed for wall joints, it is the same as the above excepting that the blades are arranged in a very shallow V, and this V is oposite that of the corner travel. In other words, the working surface is on the inside of the V instead of on the outside thereof.

Examples of this invention are illustrated in the accompanying drawings, in which:

FIGURE 1 is an isometric view of a joint trowel for corners,

FIGURE 2 is a plan view of the trowel,

FIGURE 3 is a horizontal section taken on the line 3—3 of FIGURE 1,

FIGURE 4 is a vertical section taken on the line 4—4 of FIGURE 1,

FIGURE 5 is a diagrammatic horizontal section through a corner showing a tape placed over mastic in the corner and before being pressed thereinto,

FIGURE 6 is a diagrammatic plan view of the trowel in the corner and pressing the tape into its final position,

FIGURE 7 is a view similar to FIGURE 6, but with the pressure plates omitted,

FIGURE 8 is a horizontal section through the corner and trowel at the trailing edge of the latter, illustrating the manner in which the tool spreads the mastic over the tape,

FIGURE 9 is a reduced fragmentary view similar to FIGURE 1, illustrating an alternative form of corner trowel, and

FIGURE 10 is a sectional view similar to FIGURE 3 through a trowel for wall joints, and diagrammatically illustrating the wall joint, said trowel being spaced outwardly from the wall.

Referring to the drawings, **10** is a corner joint trowel in the form of a plow **11** having a V-shaped outer working surface **12**. As the surface of the plow opposite the working surface **12** has nothing to do with the operation of this tool, said plow may be constructed in any desired manner. However, for ease of manufacture and lightness of weight, it is preferable to form the plow of a pair of blades **15** and **16** angularly arranged relative to each other and joined together along adjacent longitudinal edges to form a longitudinal nose **19** along the apex of the V of

working surface 12. Actually, blades 15 and 16 may be formed of a single piece of suitable material, such as metal, plastic or the like, bent along nose 19 to form the outer V-shaped working surface 12. The angle of blades 15 and 16 relative to each other is a little greater than the angle of the corner for which the trowel is designed. For example, if the corner angle is 90°, the angle of the blades is a little greater, such as 100°.

Trowel 10 when in operation is moved in the direction of arrow 22 in FIGURE 1. Thus, for the sake of convenience, the opposite edges of plow 11 with respect to the direction of movement of the tool are called leading edge 24 and trailing edge 25. The angle of blades 15 and 16 with respect to each other at trailing edge 25 determines the thickness of the mastic material left in the corner after trowel 10 has been moved over said material. It is preferable to provide narrow flanges 26 and 27 along leading edge 24 of blades 15 and 16, said flange projecting outwardly over working surface 12 of the plow.

Runners 28 and 29 are mounted on the working surface 12 of blades 15 and 16 respectively, extend longitudinally thereof and are spaced laterally from longitudinal nose 19. These runners preferably are substantially parallel to each other in a direction extending lonigtudinally of plow 11, and they are spaced laterally from nose 19 a distance that is a little greater than half the width of a tape of the type used in corner joints.

Runner 28 has a longitudinal surface 32 spaced outwardly from its blade 15 near leading edge 24, as indicated at 33 in FIGURE 1. This runner surface slopes inwardly to working surface 12 at 34 near trailing edge 25. Similarly, runner 29 has a longitudinal surface 36 spaced outwardly as indicated at 37 from working surface 12 near leading edge 24. This runner surface slopes inwardly to said working surface at 38. Actually, the runner surfaces 32 and 36 meet working surface 12 at 34 and 38 spaced forwardly a little from trailing edge 25. In order to provide a continuous sloping surface from the forward or leading edges of the runners right back to trailing edge 25, blades 15 and 16 are bevelled at said trailing edge at 40 and 41, bevel 41 being clearly seen in FIGURE 4. When the runner surface 32 and 36 are placed against vertical surfaces, working surface 12 of the blades slopes from leading edge 24 rearwardly towards said vertical surfaces.

Although surface 32 of runner 28 may be of any desired cross sectional shape, it should be flat in a longitudinal direction, and it preferably is flat in a lateral direction to provide a relatively wide bearing surface as illustrated in the drawings. Surface 36 of runner 29 is the same shape as surface 32.

Any suitable handle means is provided for trowel 10. In this example, a block 45 is mounted on the face of blades 15 and 16 opposite working face 12 thereof and at the point of juncture of said blades. This block has a socket 46 therein for receiving a ball 47 mounted on a neck 48 projecting from the end of a handle 50. Thus, handle 50 is connected to plow 11 by a universal joint formed by the ball and socket arrangement.

If desired, small wings 54 and 55 may be provided at the outer side edges of blades 15 and 16 at the trailing edge 25. Wings 54 and 55 have rear edges 57 and 58 which lie in the same transverse planes as runner surface 32 and blade bevel 40, and runner surface 36 and blade bevel 41. These wings form lateral confining walls outside runners 28 and 29 at the rearward or trailing end of plow 11. It is desirable to provide holes 59 and 60 in blades 15 and 16 respectively between runner 28 and wing 54, and runner 29 and wing 55.

The tool 10 described so far may be used on its own as a finishing tool. However, it may be provided with means for converting it for use in the preliminary operation of tape pressing, such means being movably or permanently attached to plow 11, a permanent attachment being illustrated in the drawings.

A pair of pressure plates 62 and 63 are mounted side by side on working surface 12 of the plow spaced inwardly from runners 28 and 29 respectively. Plates 62 and 63 are located at and on opposite sides of longitudinal nose 19 so that they slope away from each other in the same manner as blade 15 slopes away from blade 16. Although the pressure plates may be independent of each other, it is desirable to connect them along adjacent edges as at 64 immediately over nose 19. Plates 62 and 63 are inclined outwardly from working surface 12 of their respective blades 15 and 16 in a direction towards the trailing edge 25 thereof. It is preferable that these plates be resiliently retained in their normal inclined positions so that they are depressible towards the working surface of the plow.

It is preferable to form plates 62 and 63 from a single piece of suitable material, such as metal or plastic, as clearly shown in FIGURES 1 and 2. This piece of material includes flat portions 66 and 67 which are secured to the working surface of blades 15 and 16 in any desired manner, such as by welding. Plates 62 and 63 extend away and outwardly from flat portions 66 and 67 in the direction of trailing edge 25. The resiliency of the material from which the plates are formed retains them in their normal positions but permits them to be depressed towards working surface 12. In order not to interfere with this depressing action, a slot 69 is formed in the piece of material between plates 62 and 63 extending forwardly from their respective trailing edges 71 and 72. It should be noted that the angular relationship of the trailing edges 71 and 72 is opposite to the angular relationship of the trailing edge 25 of the blades 15 and 16. It is preferable to provide one or more holes 73 in plate 62 and one or more holes 74 in plate 63.

FIGURES 5 to 8 diagrammatically illustrate the action of tool 10 in a corner. The thicknesses of the various materials involved are exaggerated for the sake of clarity. In these figures, 80 and 81 are wall panels extending substantially at right angles to each other to form a corner joint 82. A layer of mastic material 83 is spread over the adjacent surfaces of walls 80 and 81 and into joint 82, and the tape 86 is placed over the mastic and into the corner, as shown in FIGURE 5.

When a corner trowel including pressure plates 62 and 63 is pressed into the corner, it is moved along said corner, usually from the bottom of the walls to the top thereof in a vertical corner, and the trailing edges of plates 62 and 63 resiliently press against tape 86 to force it firmly into the corner over mastic 83, see FIGURE 6. The angular relationship of the trailing edges 71 and 72 of the plates 62 and 63 exerts a stretching action on the tape outwardly from the corner and maintains the tape in a taut, unwrinkled condition as the trailing edges 71 and 72 pass thereover. As the trowel is moved along the corner, the tape is firmly pressed into position, and this forces excess mastic out from the edges of the tape. Runners 28 and 29 being close to said edges confine this excess material so that it cannot spread laterally from beneath the trowel. It will be noted that the pressure plates move over the tape immediately ahead of the trailing edge 25 of plow 11. This trailing edge which is diagrammatically illustrated in FIGURE 8 presses the excess mastic inwardly towards walls 80 and 81. As the material cannot spread outwardly laterally from beneath the tool because of runners 28 and 29, it must spread inwardly over tape 86. Flanges 26 and 27 help confine the excess mastic between the tool and the walls so that a pressure builds up in the mastic, and this helps to spread it across the top of the tape. In addition, to this, holes 73 and 74 in the pressure plates allow some of the mastic to pass through said plates on to the outer surface of the tape immediately after it has been firmly pressed into the corner. If there is sufficient mastic, the tape will be completely covered and the operation finished in one movement of trowel 10 along the corner. If the holes 73 and 74 were not provided in the pressure plate to allow the build-up of mastic in

front of the pressure plates to pass through these holes, the build-up of mastic in front of the plates would be sufficient to hold the plates away from the tape and the required action of the plates to press firmly against the tape would be hindered. It should be understood that the trailing edges **71** and **72** of the plates **62** and **63** press against the tape to force it firmly into the corner and as they pass over the tape they will remove practically all of the mastic from the tape. It is the function of the trailing edge **25** to then spread a thin layer of mastic over the tape in the finishing operation. It should be kept in mind that the corner may be a vertical one, as the corner of a room, or it may be a horizontal corner, such as the corner formed between a ceiling and a wall.

The effective transverse angle of plow **11** is that of trailing edge **25**. As this angle is a little larger than the angle of the wall corner, the portion of nose **18** at said trailing edge is spaced outwardly from joint **82**, but the blades extend laterally right to walls **80** and **81**, as clearly shown in FIGURE 8. As the runners do not confine the mastic along the bevel **14** at the trailing edge, said mastic is relatively thick at the centre over joint **82** but tapers laterally to merge into the surfaces of walls **80** and **81**. In other words, the mastic material over the tape is relatively thick at the centre thereof, and feathers laterally to merge with the wall surfaces. If there happens to be too much mastic available, wings **54** and **55** prevent it from spreading too far outwardly from the corner. Furthermore, mastic trapped inside wings **54** and **55** passes through holes **59** and **60** in the blades and drops to the floor. As the blades slope longitudinally away from the walls, these holes are spaced outwardly from the walls, and so the mastic passing through said holes falls clear of the walls.

Sometimes it is not desirable originally to provide sufficient mastic in the corner for the entire job, or there accidentally is insufficient mastic. In this case, the operation of the tool is as described above, but the excess mastic squeezed from beneath the tape will not be sufficient to make a good job of covering it. In this case, after the tape has been pressed by the tool into the corner in the manner described, an additional amount of mastic is applied to the outer surface of the tape. When this is done, a corner trowel without pressure plates **62** and **63** is fitted into the corner and moved therealong. As the leading edge of plow **11** is spaced outwardly from the wall surfaces forming the corner by the leading edges of runners **28** and **29**, the plow rides over the mastic and gradually applies pressure thereto towards the plow trailing edge. This trailing edge distributes the mastic over the tape and smooths it out in the manner described above and clearly shown in FIGURE 8.

Corner trowel **10** not only quickly and easily distributes and smooths the mastic in the corner as desired, but it is so constructed that it has to fit accurately into the corner and travel therealong in a proper course without the necessity of the operator being skilled in this work. Runners **28** and **29** automatically locate the tool properly in the corner when it is pressed into said corner. When the runners bear against the surfaces of walls **80** and **81**, the blades of plow **11** are in their proper positions relative to said corner, and said runners prevent the tool from being tipped laterally with respect to the corner. The tool cannot be moved along the corner if the runners are not properly aligned therewith, and it cannot be moved other than properly along the corner after the runners have been correctly positioned.

FIGURE 9 illustrates a modification of the corner joint trowel for use where the bearing surface of the wall on one side of a corner is relatively narrow so that there is no bearing surface available for one of the runners of the tool. Trowel **10***a* of FIGURE 9 is not provided with pressure plates **62** and **63**, and instead it has shoes **94** and **95** mounted on and projecting from working surface **12***a* of blades **15***a* and **16***a* near nose **19***a*, said shoes running longitudinally of the trowel.

Trowel **10***a* is used when one finished wall forming a corner is too narrow to provide a bearing surface for one of the runners of the tool. In this case, either shoe **94** or **95** will bear against the narrow portion of the wall so that the trowel functions as described above. As the tool is moved along the corner, the shoes thereof move through the mastic over the tape, but the trailing edge of the tool follows the shoes and spreads the mastic out in the proper manner.

FIGURE 10 diagrammatically illustrates trowel **110** for a wall joint. This trowel is the same as those described above, except in that its blades **115** and **116** are arranged in a very shallow V, and the working surface **112** thereof is on the inside of a V instead of the outside thereof as is the case with the other trowels.

FIGURE 10 includes a wall **120** made up of panels **121** and **122** forming a joint **123** therebetween. Mastic **128** is placed over and into joint **123**, and a tape **129** pressed over this mastic. Trowel **110** is moved along wall **120** and over joint **123** so that it functions in the manner described above to form a layer of mastic **130** over the tape which tapers outwardly and merges into the wall panels at **123** and **124**. Trowel **110** may or may not be provided with pressure plates similar to plates **62** and **63** of trowel **10**, and it may have shoes similar to shoes **94** and **95** of trowel **10***a* for use when either of the panels **121** and **122** is too narrow to provide a bearing for one of the runners of the trowel.

What I claim as my invention is:

1. A joint trowel comprising a pair of blades arranged angularly relative to each other and joined together along adjacent longitudinal edges to form a wedge shaped plow, each blade having an outer working surface, a pair of runners on and extending longitudinally of the working surface, such runners being positioned in parallel relationship one on each side of and spaced laterally from the joint adjacent longitudinal edges and each having outer longitudinal surfaces at an angle to the outer working surface and to the joined adjacent longitudinal edges, a pair of pressure plates mounted at one end on the outer working surfaces between the runners to lie normally at an angle substantially opposite to the angular longitudinal surface of the runners and away from the outer working surfaces, such pressure plates being depressible under tension toward the working surfaces of the plow.

2. The joint trowel as claimed in claim 1 wherein each pressure plate is formed with openings therethrough to allow material in front of the pressure plates to fall through the openings onto the working surfaces of the plow and wherein the trailing edges of each pressure plate lies at an angle substantially opposite to the trailing edge of the working surface to which the pressure plate is attached.

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