United States Patent [19]

Hilgers

[11] **3,883,064**

[45] **May 13, 1975**

[54] **BRACKET SETTING TOOL**

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[22] Filed: **Mar. 29, 1974**

[21] Appl. No.: **456,367**

[52] **U.S. Cl.** **227/120;** 227/125; 227/147

[51] **Int. Cl.** **B25c 1/02**

[58] **Field of Search** 227/120, 125, 126, 128, 227/129, 134, 147

[56] **References Cited**

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Primary Examiner—Granville Y. Custer, Jr.

Attorney, Agent, or Firm—Wegner, Stellman, McCord, Wiles & Wood

[57] **ABSTRACT**

A tool for setting brackets in wood or the like, includes a hammer actuated drive mechanism and a bracket containing magazine. The drive mechanism has drive legs cammed into position to, first, unstack the bottom bracket from a stack of brackets in a magazine and, secondly, to drive said unstacked bracket into set position in wood or the like. The bottom drive leg is bifurcated and has an angled front surface to permit advancing of the stack of brackets into position and the side drive legs are urged into bracket driving contact by a cam member on side plates. The magazine for storing a stack of brackets has a pivoted loading and unloading cover and has a U-shaped, spring actuated retainer urging the bottom bracket of said stack of brackets into position ready for setting.

12 Claims, 9 Drawing Figures

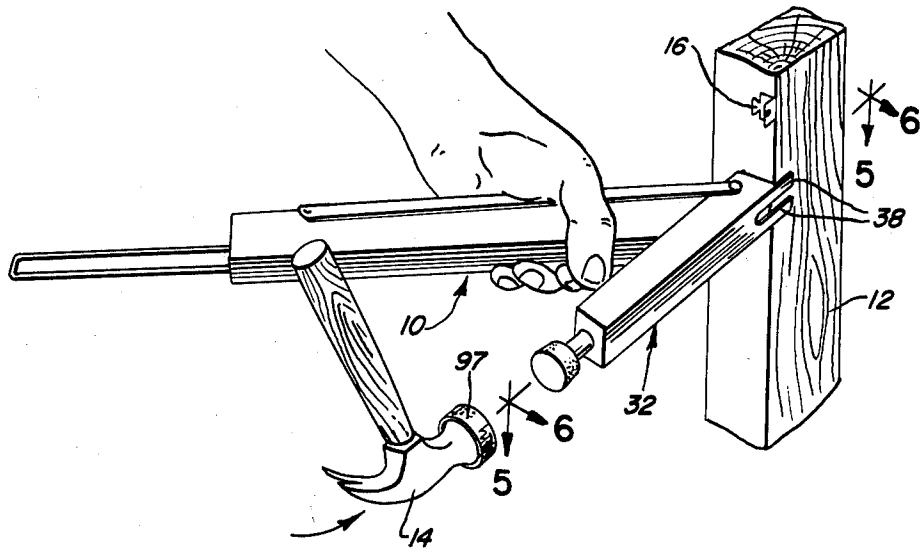


FIG. 1

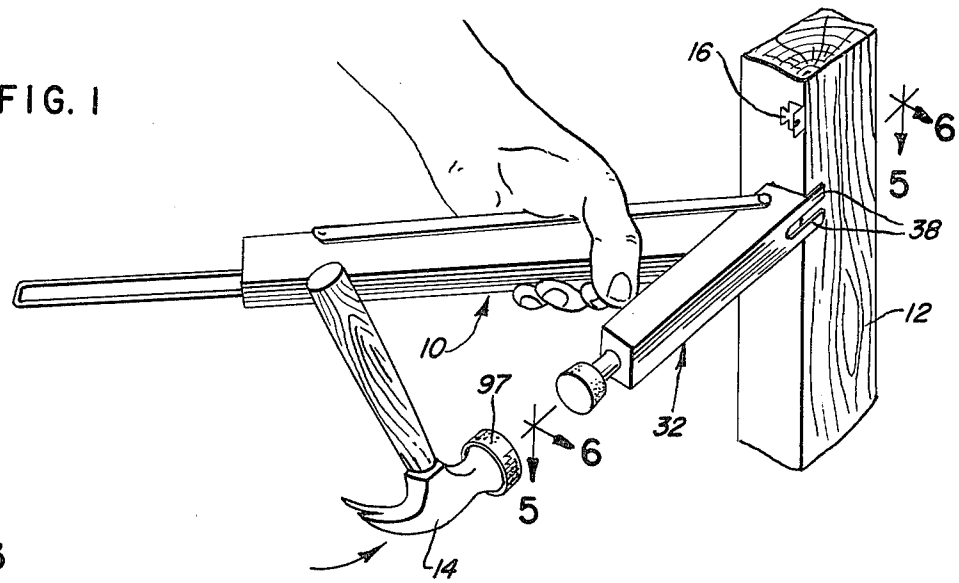


FIG. 3

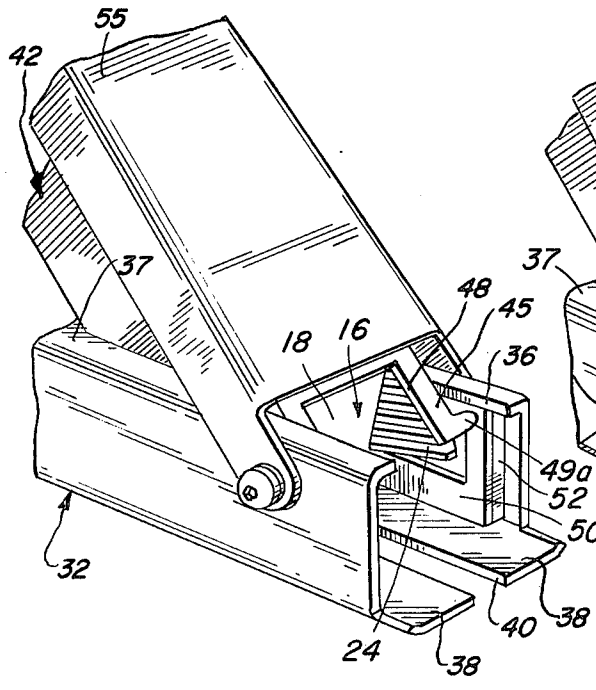


FIG. 4

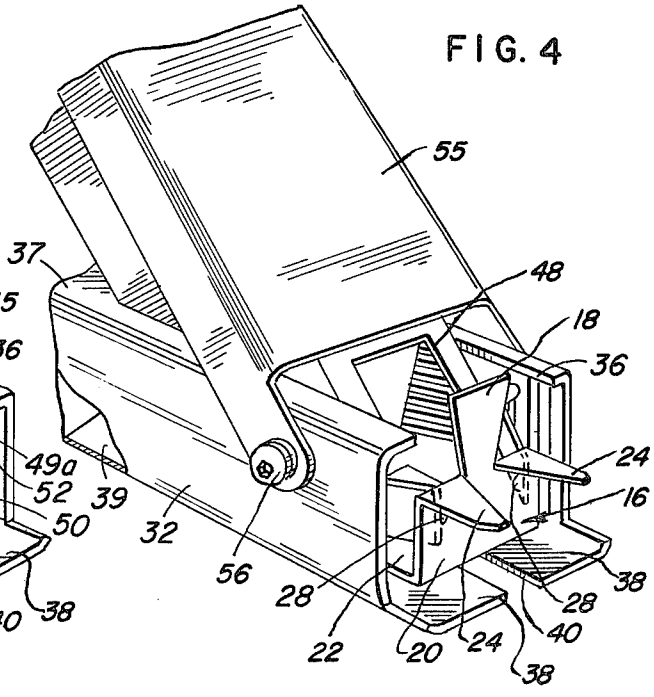


FIG. 9

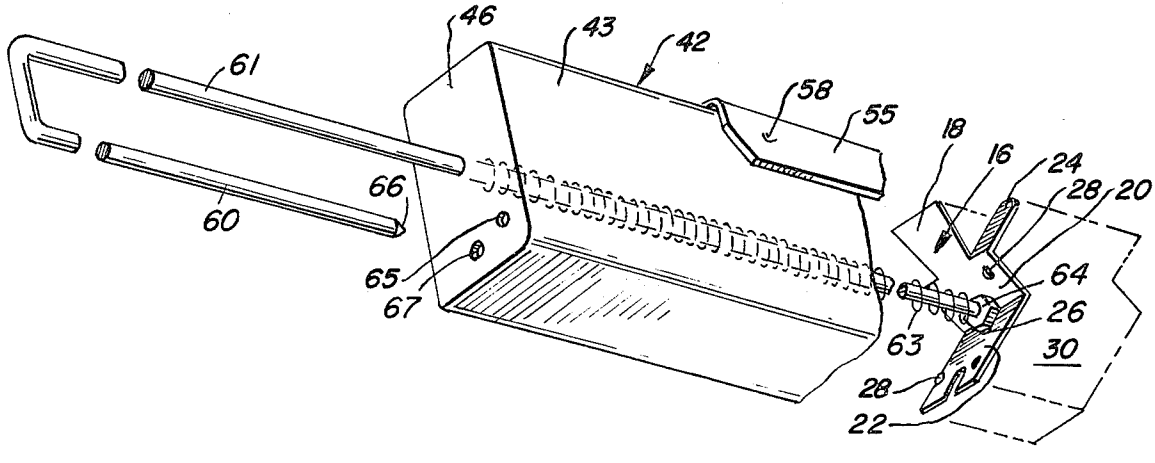


FIG. 2

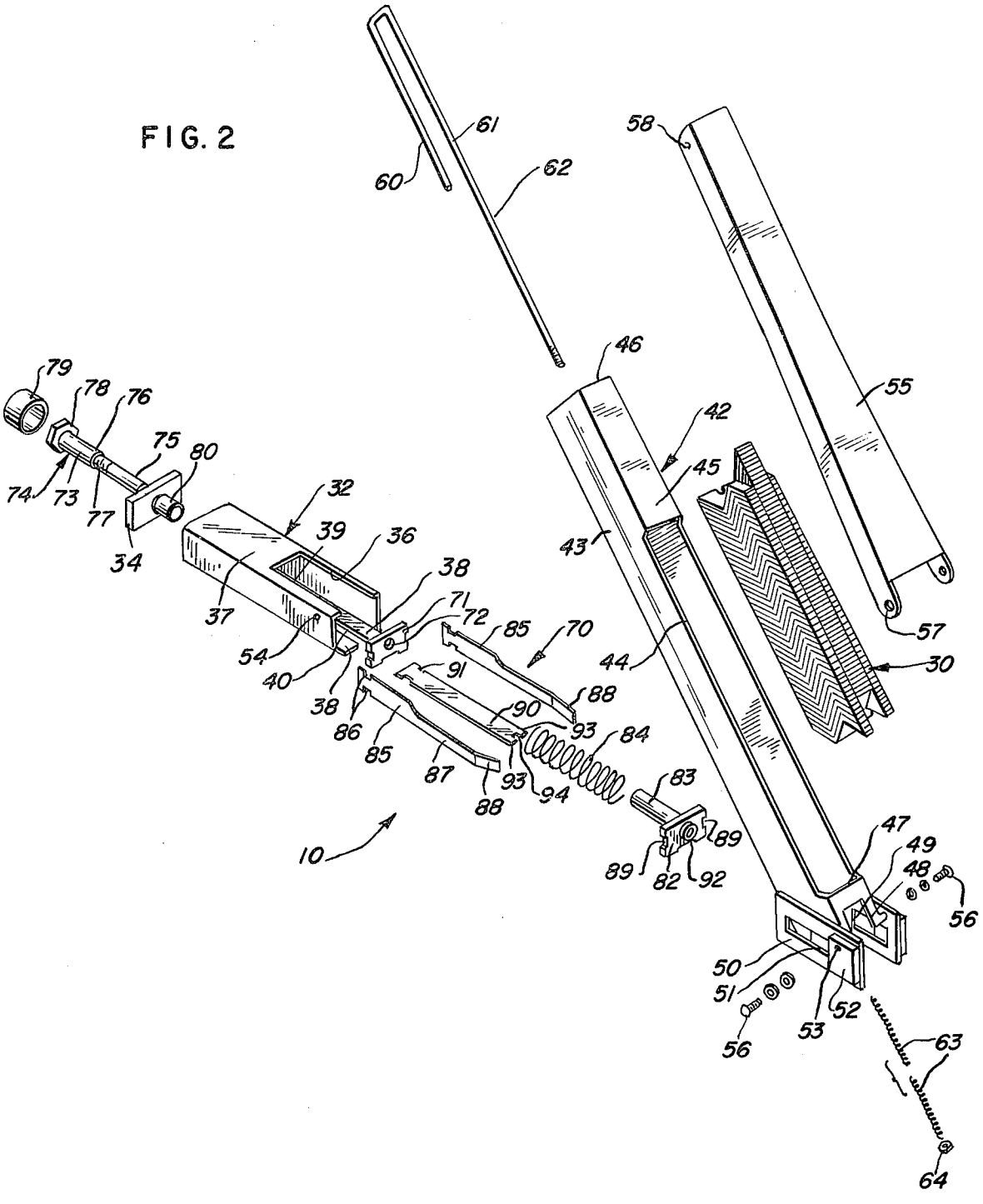

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FIG. 5

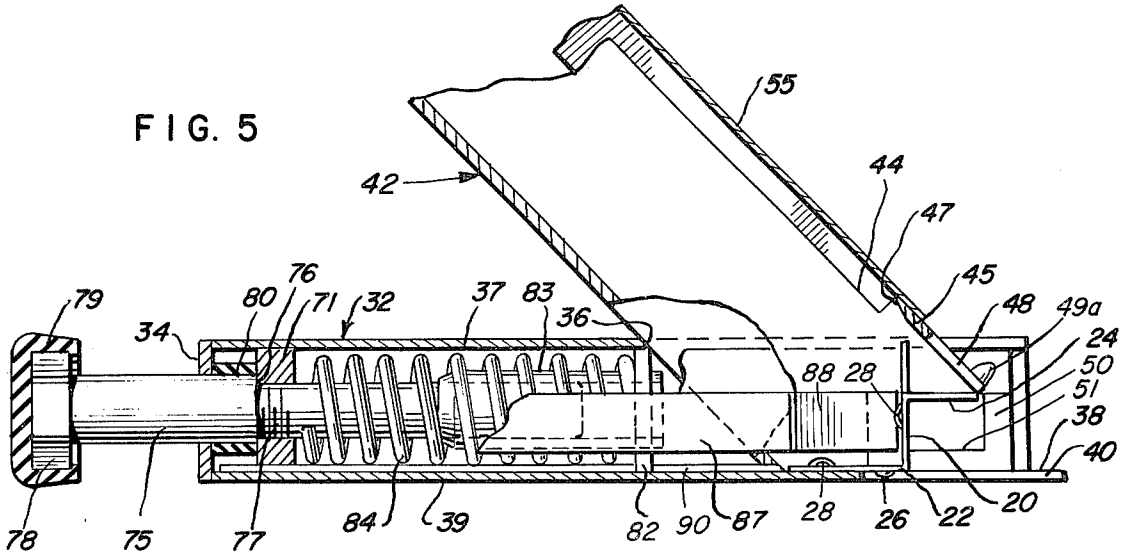


FIG. 6

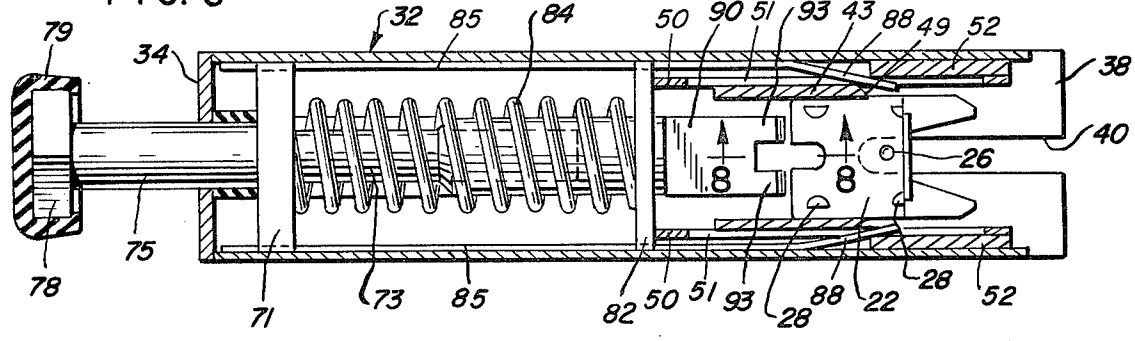


FIG. 7

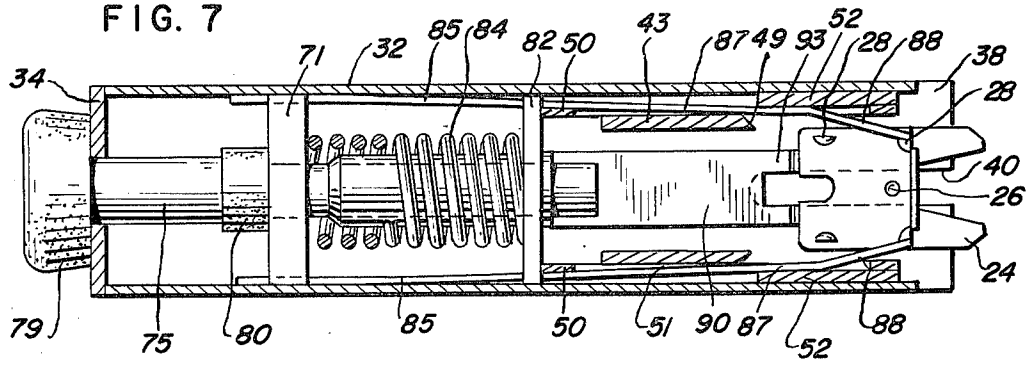
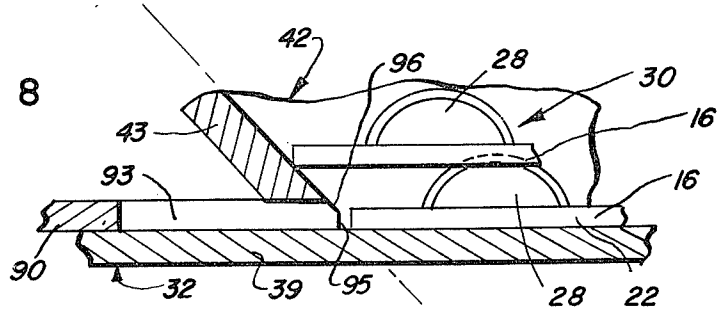


FIG. 8



BRACKET SETTING TOOL

BACKGROUND OF THE INVENTION

This invention relates to tools for the construction industry and, more particularly, to a tool for setting wallboard backing brackets.

In my copending application Ser. No. 80,975, filed Oct. 15, 1970, entitled "Wallboard Bracket," I described the use of a bracket in erecting a building which saves considerable material and, therefore, reduces the cost of the construction. Specifically, in partitioning the inside shell of a home, for instance, it is necessary to use one or possibly two additional studs where the partition wall joins the outside wall against which studs the edge of the wallboard can be nailed. In my prior filed application, I describe a bracket which can be attached to a stud to provide a backing for the edge of the wallboard without the installation of the one or two additional studs thereby saving the expense of the material and the expense of the installation of said stud for backing said wallboard.

There are no known tools or guns available for setting brackets for backing Sheetrock or the like, nor are there any known brackets that can be stacked for use in tools or guns for machine installation.

SUMMARY OF THE INVENTION

A bracket setting tool is provided and comprises a tube containing a bracket driving mechanism and a bracket storing magazine connected to said tube at an angle with respect thereto. The bracket driving mechanism has an externally exposed drive bolt or lug which receives the blow from a hammer for propelling the driving mechanism forward to pick up a bracket from the bottom of a stack of brackets maintained in the magazine and to drive said bracket forward and into set position in the wood, or the like, building member. The stack of brackets in the magazine are positioned one with respect to the other in such a way that the bottommost bracket is urged by a U-shaped retainer acting upon the end of the stack to position the bottommost bracket in alignment with the driving mechanism ready to be driven into set position. The tool has a pair of tabs which are positioned on the edge of the stud or building member so as to properly align the bracket on the stud. The bracket then forms the backing for the edge of a sheet of wallboard.

The driving mechanism has a bottom drive leg with a sloped forward bifurcated pair of fingers which fingers engage the bottom bracket in driving the bracket forward into set position. The angled forward surfaces of the fingers permit the next to the bottom bracket to move into the bottommost position when the drive mechanism is retracted ready for the next setting operation. The side drive legs of the driving mechanism pass through a slot in a guide plate and are cammed into bracket engaging position by a cam member carried by the guide plate. The impact bolt on the driving mechanism has a shoulder which bears against a drive slug so that the blow on the drive bolt is transmitted to the drive slug and therethrough to the drive legs and on to the bracket. The lower surface of the forward portion of the magazine is positioned in alignment with the space between the bottom and the next to the bottommost bracket in the stack so that the bottommost bracket can be sheared from the stack individually as it is driven into set position.

The setting tool is economical, efficient and durable and is very effective for setting the brackets in position resulting in a substantial savings in the cost of erecting a building such as a home or the like.

BRIEF DESCRIPTION OF THE DRAWINGS

The details of construction and operation of the invention are more fully described with reference to the accompanying drawings which form a part hereof and in which like reference numerals refer to like parts throughout.

In the drawings:

FIG. **1** is a schematic view of the bracket setting tool held in position against a stud ready to receive a hammer blow to set a bracket;

FIG. **2** is an exploded perspective view of the parts of my improved bracket setting tool;

FIG. **3** is an enlarged perspective view of the junction between the magazine the the driving mechanism prior to actuation of the device;

FIG. **4** is an enlarged perspective view similar to FIG. **3** only with a bracket propelled forward into set position, the stud into which the bracket is set is not shown;

FIG. **5** is a cross-sectional view taken on the line **5—5** of FIG. **1** with some parts shown in full;

FIG. **6** is a cross-sectional view taken on the line **6—6** of FIG. **1**;

FIG. **7** is a view similar to FIG. **6** only with the driving mechanism in a forward position;

FIG. **8** is an enlarged view of the forward ends of the bottom drive leg taken on the line **8—8** of FIG. **6**; and,

FIG. **9** is a perspective view of the magazine with the stack of brackets shown partially in phantom.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, and in particular to FIG. **1**, a bracket setting tool **10** is shown held in position against a stud **12** with a person holding the tool about to strike a blow with a hammer **14** against the actuator of the tool to set another bracket **16** in said stud. The bracket **16** is generally of the type shown and described in my copending application Ser. No. 80,975, filed on Oct. 15, 1970, and entitled "Wallboard Bracket," and, as shown in FIG. **4**, has a tab **18** connected to a web portion **20** with a body or bottom portion **22** at right angles to said web **20** and a pair of prongs **24** lying in a plane parallel to said body portion **22**. As shown in FIGS. **4, 5** and **9**, the body portion **22** has a dimple **26** projecting downwardly therefrom and both the body portion **22** and the web **20** have struck portions **28** which project out of the planes of said body and web. The dimple **26** and the struck portions **28** serve to space one bracket **16** from the next bracket **16** in the stack of brackets **30** for a purpose which will appear hereinafter.

As shown in FIGS. **2, 6** and **7**, an elongate drive tube **32** is provided and has an end cap **34** fastened to one end portion thereof either by welding, by shaping over extensions of the side walls or the like. The drive tube **32** has an elongate opening **36** formed in the top wall **37** and has a pair of positioning tabs **38** projecting forward from the bottom wall **39** with a slot **40** extending rearwardly therebetween.

A magazine **42** formed as a hollow member **43** has an elongate opening **44** formed in an upper wall **45** and has an end cap **46** closing the remote end of said mem-

ber 43. The cap 46 can be attached in any well known manner such as by spot welding on the open end of the member 43 or by coining recesses in said end cap and shaping extensions of the walls of the member 43 into said recesses. The lower end of said opening 44 has an inwardly tapered edge 47 (FIG. 5) which serves to prevent the brackets 16 from hanging up thereon when the stack 30 rests on the cover 55 from upside down use of the tool. The lower end of said magazine 42 has an open slot 48 in the wall 45 through which the tab 18 of the brackets 16 pass with the sides of said end of the magazine having offset openings 49. A pair of guide rails 50 are welded as at 49*a* or otherwise secured to the sides of said member 43 with the top and bottom edges of said rails 50 being parallel to each other and being at an acute angle with respect to the axis of the magazine 42. The guide rails 50 are designed to slip fit into the open end of the drive tube 32 so as to support the drive tube 32 at an acute angle to the axis of the magazine 42. The guide rails 50 also have elongate guide slots 51 therethrough with the top and bottom walls of said slots 51 lying parallel to the top and bottom edges of the rails 50. A cam block or cam member 52 is secured to the outside wall of each rail 50 and overlaps the forward end portion of the guide slot 51. The cam blocks 52 likewise slide into the open end of the drive tube 32 along with the guide rails 50 and said cam blocks have threaded openings 53 aligned with openings 54 in the drive tube 32 so that a cover plate 55 on the magazine 42 can be pivotally mounted to the magazine 42 and to the drive tube 32 by means of threaded members 56 passing through openings 57 in said cover 55. The cover 55 has dimples 58 gripping the sides of the magazine 42 to hold said cover closed over the opening 44.

Passing through the end cap 46 of the magazine are both legs 60, 61 of a U-shaped retainer 62 which has a spring 63 encircling longer leg 61. Spring 63 is positioned inside the housing or hollow member 43 and is held in a compressed condition between the inside of cap 46 and a nut 64 threaded on leg 61. The retainer 62 can be pulled out of the magazine 42 until the end of the short leg 60 clears the end cap 46 whereupon the retainer can be rotated about the axis of leg 61 until the leg 60 aligns with recess 65 in the end cap (FIG. 9) whereupon release of the retainer 62 will hold said retainer in an inoperative position relative to the inside of the magazine. Recess 65 is smaller in diameter than the diameter of leg 60 so that the pointed end 66 of leg 60 will seat in said recess 65 to hold said retainer 62 in the inoperative condition. A stack 30 of brackets 16 (see FIGS. 2 and 9) can be dropped in the opening 44 with the cover 55 pivoted open and with the retainer 62 in the inoperative position. The stack 30 is oriented with the prongs 24 projecting toward the opening in the magazine. The cover 55 is snapped closed and the retainer is made operative by aligning leg 60 with the opening 67 in the end cap and upon release permits the spring 63 to drive the end of long leg 61 of the retainer against the end of the stack to urge the bottom bracket 16 in position for setting.

The drive tube 32 encases the drive mechanism 70 which comprises a drive slug 71 having a threaded opening 72 centrally disposed therethrough and in which a drive bolt 74 is secured. The drive bolt 74 has a drive shaft 73 which has an enlarged diameter presenting a shoulder 76 adjacent a threaded portion 77 on the reduced diameter guide portion 75 of said bolt 74. The bolt 74 is inserted through the opening in end cap 34 with the threaded portion 77 threading into opening 72 and having the shoulder 76 bearing against the drive slug 71 with guide 75 extending forward of said slug 71. The bolt 74 has an enlarged contact head 78 exposed externally of tube 32 and over which head a cup-shaped impact member 79 is seated to protect said head 78 from direct blows from the hammer 14. A resilient sleeve 80 encircles the enlarged drive shaft 73 of bolt 74 inside said tube 32 and bears between end cap 34 and drive slug 71.

A guide tube plate 82 is positioned in said tube 32 and has a bolt guide sleeve 83 swagged or otherwise secured therein. The sleeve 83 telescopically encircles the reduced diameter guide portion 75 of bolt 74 and supports a compression spring 84 extending between guide tube plate 82 and drive slug 71. A pair of side drive legs 85 are keyed to drive slug 71 by recesses 86 formed in said legs 85 near one end thereof so that said legs 85 are adapted to move with said drive slug 71. The side drive legs 85 have reduced portions 87 forward of said drive slug and terminate with inturned fingers 88 on the forward end portion. The reduced portions 87 slide in grooves or guides 89 in the sides of guide tube plate 82. The inturned fingers 88 on the side legs 85 pass through the guide slots 51 in guide rails 50 with the cam members 52 engaging the outside surfaces thereof (see FIG. 7). A bottom drive leg 90 is keyed by recesses 91 to the drive slug 71 and is free to slide in slot 92 in the guide tube plate 82. The forward end of bottom drive leg 90 has a pair of bifurcated fingers 93 spaced apart by a slot 94. As shown in FIG. 8, the forward end surfaces 95 of the fingers 93 are partially sloped or tapered at 96 at an angle equal to the angle of orientation of the magazine 42 to the drive tube 32 so as to permit brackets 16 to pass from the stack into position ready to be driven into a stud or the like. The forward end surfaces 95 of drive leg 90 extend a short distance rearward of the ends of side drive legs 85, 85 and contact the bracket 16 slightly ahead of the contact from side legs 85, 85 so as to unstack the bottom bracket 16 and start it forward for seating.

In operation, the tool has a stack 30 of brackets 16 dropped in the magazine 42 after the cover 55 is opened and the retainer 62 is rendered inoperative. The prongs 24 on the bracket 16 project forward and lie generally parallel to the axis of the drive tube. The bottom bracket 16 in the stack 30 drops down to a position with the dimple 26 in opening 40 between the tabs 38 and the body 22 of the bracket rests on the bottom wall 39 of the tube 32. The lower edges of the top wall 45 of the magazine 42 align with the open space between the two bottommost brackets 16 (FIG. 5). The hammer 14 is provided with a cap 97 around the head thereof. The cap 97 is made of a tough material designed to prevent the adverse effects of metal-to-metal contact between the hammer and the drive lug 78. The hammer cap 97 is adapted to strike either the lug 78 or the cap 79 seated on said lug 78. Spare caps 97 and 79 are provided for easy replacement after extensive use of the device.

The tabs 38 are engaged against a stud 12 (FIG. 1) and the hammer is wielded to administer a sharp blow to the cap 79, head 78 and drive bolt 74. The drive bolt 74 drives the drive slug 71 and associated drive legs 85, 85, 90 forward. Drive leg 90 will contact the bracket 16

first and start it forward whereupon drive legs **85, 85** will have the inturned fingers **88** cammed inward by the cam members **52** and will have the ends of the fingers **88** assume a drive attitude in relation to the back of the web **20** of the bracket prior to resistance of the bracket entering the stud. The bottom drive leg **90** has the surface **95** of fingers **93** engaging the back edge of the body **22** of the bracket slightly ahead of contact by the fingers **88** of the side legs. Said slightly early contact by leg **90** serves to shear the bottom bracket **16** from the stack **30.** After the initial contact by the leg **90** continued movement of the drive mechanism will bring the two side drive legs **85, 85** in position with the fingers **88** against the struck portions **28** on web **20** to drive the bracket into the framing member. The drive mechanism **70** will be returned to the retracted position (FIGS. **3, 5, 6**) by the spring **84** with the sleeve **80** absorbing some of the rebound force to prevent hammering the rear ends of the drive legs **85, 85** and **90** against the end cap **34** of the tube **37.** The drive legs **85** will be returned to a position parallel to the sides of the drive tube with fingers **88** expanded sidewardly from the driving position as the drive mechanism retracts. Due to the sloping front edge **96** of the bottom drive leg fingers **93,** the stack **30** with the next bracket **16** will drop down into position ready for the next blow of the hammer when the tool **10** has been moved to another position on the stud.

The threaded members **56** serve to secure the magazine **42** to the drive tube **32** and at the same time acts as the pivots for the cover **55** on the magazine. This construction simplifies assembly and reduces costs. When the device is used for overhead plates, it is possible for the stack **30** to bear against the inside cover **55.** The edge **47** of opening **44** is sloped to provide a guiding surface for the brackets past said opening **44** without hanging up and becoming inoperative by reason of no bracket being in position to be driven into a stud.

I claim:

1. A bracket setting tool having a drive tube for encasing a drive mechanism and a magazine for receiving a stack of brackets, said magazine intersecting said drive tube at an acute angle, said drive mechanism comprising a drive bolt having a contacting head exposed externally of said tubing, a drive slug slidably mounted in said tubing and being connected to said drive bolt, a guide tube plate mounted in said tubing and having a bolt guide tube telescopically receiving said drive bolt, compression spring means encircling said drive bolt and urging said drive slug and said guide tube plate apart, plural drive legs keyed to said drive slug for movement with said drive slug, one of said drive legs being a bottom leg positioned on the bottom of said drive tube and having a bifurcated pair of fingers extending forward in position to engage a bottom bracket in the stack of brackets in said magazine, the forward edge of said fingers being partially sloped in a plane common to the acute angle of the plane of the wall of the magazine so as to permit the stack of brackets to advance the bottom bracket into position for setting, two of said drive legs being side drive legs, each said side drive leg having an inwardly directed drive finger, a camming member in said drive tube in the path of movement of each side drive finger which member deflects said side finger inwardly to engage the opposite sides of the bottom bracket in said stack of brackets, resilient means between said drive slug and said drive tubing for absorbing rearward movement of said drive slug, a cover for said magazine pivoted at the junction between said magazine and the drive tube and adapted to be pivoted away from said magazine to permit a stack of brackets to be inserted in said magazine, a U-shaped retainer extending into said magazine from a remote end thereof, a spring on one leg of said retainer urging the end of said leg against the remote end of said stack of brackets to urge said brackets toward said drive tube, and being retractable against said spring urging to said retainer a disengaged position when a new stack of brackets is placed in said magazine.

2. In a setting tool as claimed in claim **1** wherein said side drive legs pass through a guide rail on the sides of said magazine with said camming member positioned on said guide rail in engagement with the outside surfaces of said movable drive legs.

3. In a setting tool as claimed in claim **1** wherein said bottom drive leg has an opening between said fingers into which a dimple on the bottom of each bracket nests as each bracket is forced into the bottommost position in the stack ready for setting.

4. In a setting tool as claimed in claim **1** wherein an outer wall of said magazine has a bottom edge aligned with the gap between the two bottommost brackets so as to retain the next to the bottom bracket in the stack as the bottom bracket is being set.

5. In a setting tool as claimed in claim **1** wherein said drive bolt has a shoulder bearing against said drive slug with said drive bolt extending through said drive slug.

6. In a bracket setting tool having a tube containing a drive mechanism and a magazine intersecting said tube at an angle with respect thereto, said magazine adapted to receive a stack of brackets with the bottommost bracket being aligned with said drive mechanism, said drive mechanism having means exposed externally of said tubing for receiving a blow from a hammer, said drive mechanism having a plurality of drive legs with at least two of said legs being cammed into position to engage and advance the bracket aligned with said drive mechanism, a cover for said magazine pivoted thereto and adapted to be opened to permit a stack of brackets to be inserted in said magazine, a retainer in said magazine, and a spring on said retainer urging said retainer against the end of said stack of brackets to urge said brackets toward said tube.

7. In a bracket setting tool as claimed in claim **6** wherein the pivot for said cover is located at the junction between the magazine and the tube and secures said magazine to said tube.

8. In a bracket setting tool as claimed in claim **6** wherein one of said drive legs is a bottom leg and has a bifurcated pair of fingers extending forward in position to engage the bottom bracket in said stack of brackets, a portion of the forward edge of said fingers being sloped in a plane common to the plane of the wall of the magazine so as to permit the stack of brackets to advance the bottom bracket into position for setting.

9. In a bracket setting tool as claimed in claim **8** wherein the forward edge of said fingers of said bottom leg are positioned to make contact with said bracket prior to contact by said at least two drive legs.

10. In a bracket setting tool as claimed in claim **6** wherein said camming of said two legs is produced by said tube having a camming member in the path of movement of said two drive legs which member deflects said drive legs inwardly to engage the opposite

sides of the bottom bracket in said stack of brackets as said drive mechanism is moved forward.

11. In a bracket setting tool as claimed in claim **10** wherein means are provided between said drive mechanism and said tube for absorbing rearward shock of said drive mechanism.

12. In a bracket setting tool as claimed in claim **6** wherein said retainer is retractable against said spring urging to a disengaged position when a new stack of brackets is placed in said magazine.

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