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United States Patent [19]

West

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[45] Reissued Date of Patent: Feb. 8, 2000

[54] **ADJUSTABLE MOUNTING FOR A POST SYSTEM**

[76] Inventor: **Ronald R. West**, 545 E. 200 North, Provo, Utah 84606

[21] Appl. No.: **08/837,010**

[22] Filed: **Apr. 11, 1997**

Related U.S. Patent Documents

Reissue of:

[64] Patent No.: **5,404,682**
Issued: **Apr. 11, 1995**
Appl. No.: **08/190,385**
Filed: **Feb. 1, 1994**

U.S. Applications:

[62] Division of application No. 07/856,639, Mar. 24, 1992, Pat. No. 5,307,598.

[51] **Int. Cl.**[7] **E02D 5/54**; F16M 13/00

[52] **U.S. Cl.** **52/165**; 52/114; 52/155; 248/183.1; 248/288.31; 248/398; 248/516

[58] **Field of Search** 52/165, 298, 114, 52/155; 248/516, 181.2, 288.51, 398; 403/90, 192, 193, 326, 328, 380, 375

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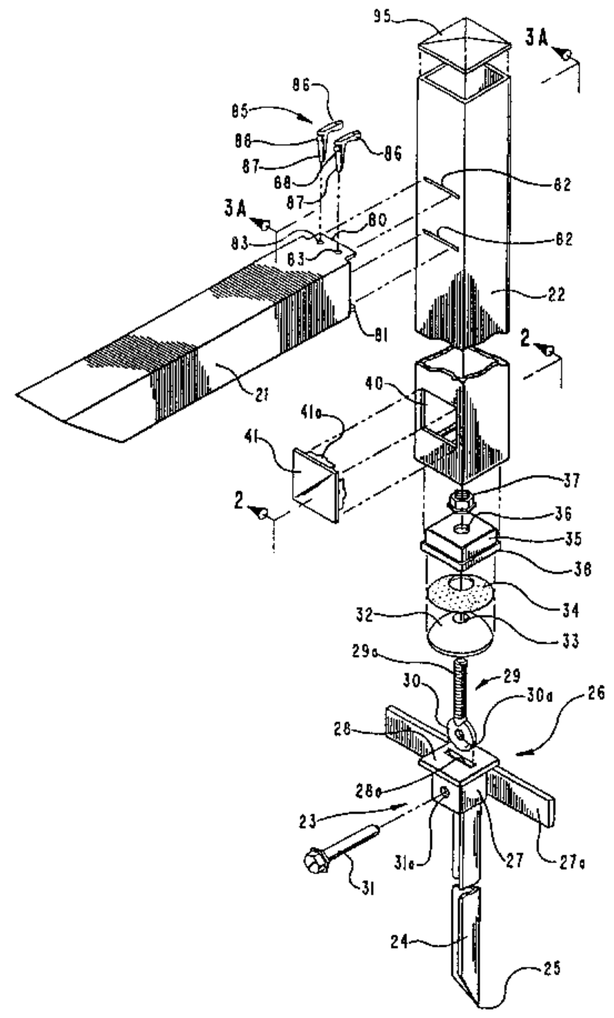
Primary Examiner—Christopher Kent
Attorney, Agent, or Firm—Clayton, Howarth & Cannon, P.C.

[57] **ABSTRACT**

An adjustable mounting for a post system for use in aligning and maintaining a post attached thereto to a desired vertical attitude to a ground surface. The adjustable mounting includes, as embodiments, a ball segment and seat combination that are movable with respect to one another, and in another embodiment involves a pair of interactive tapered washers, with the embodiments all including arrangements for clamping together the components that is a single bolt type fastener that is for maintaining the components of the adjustable mounting between a ground stake top surface, or ground surface, and a post bottom end or post insert base. The relative positioning of the seat to the ball segment and the tapered washers tapered surfaces to one another is to provide an off-set from a straight line axially through which adjustable mounting, that is transferred directly into a post, or a post insert with a post telescoped thereon, as an angle of that post to the vertical, which post can be used as a fences post, sign post, or the like, and may include an arrangement for mounting a container, such as a box or tube, cantilevered thereto that is intended for receiving delivered items, such as mail and/or newspapers.

36 Claims, 12 Drawing Sheets



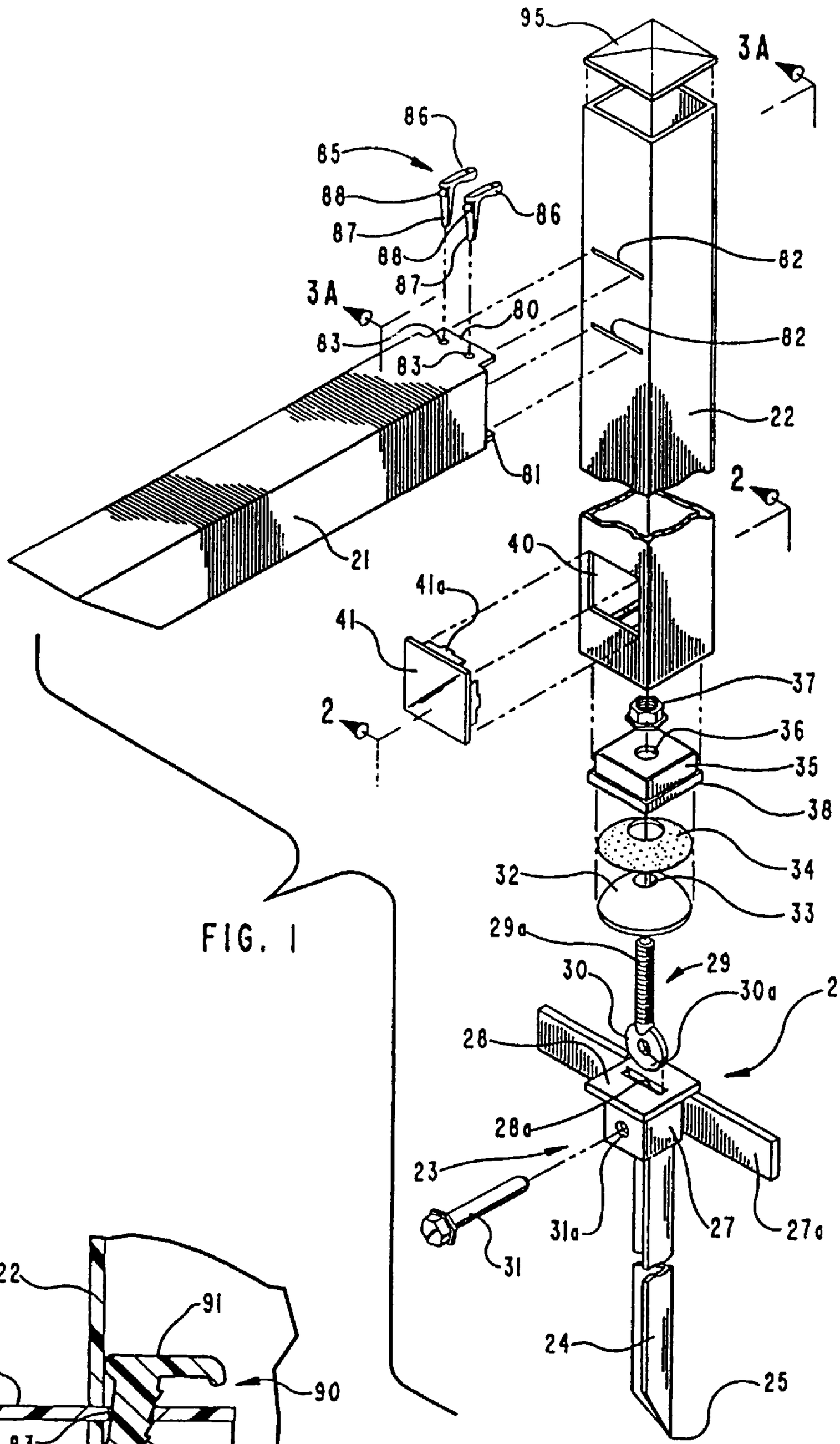

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FIG. 1

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FIG. 3B

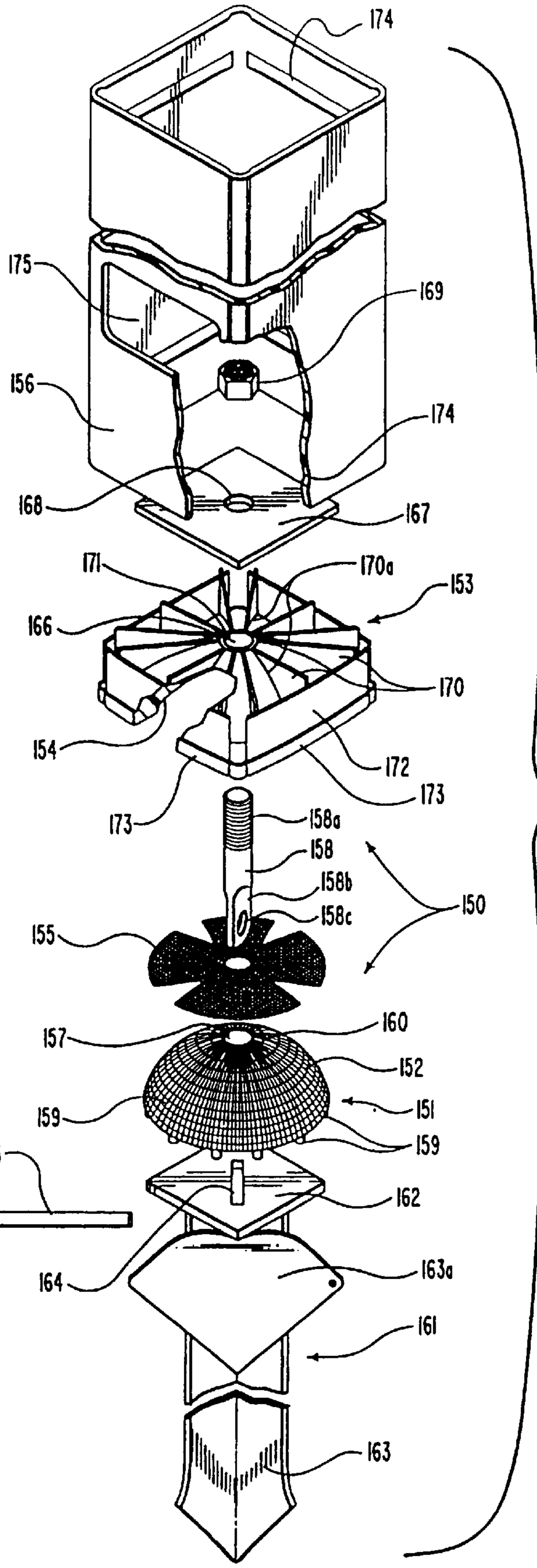
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FIG. 1A

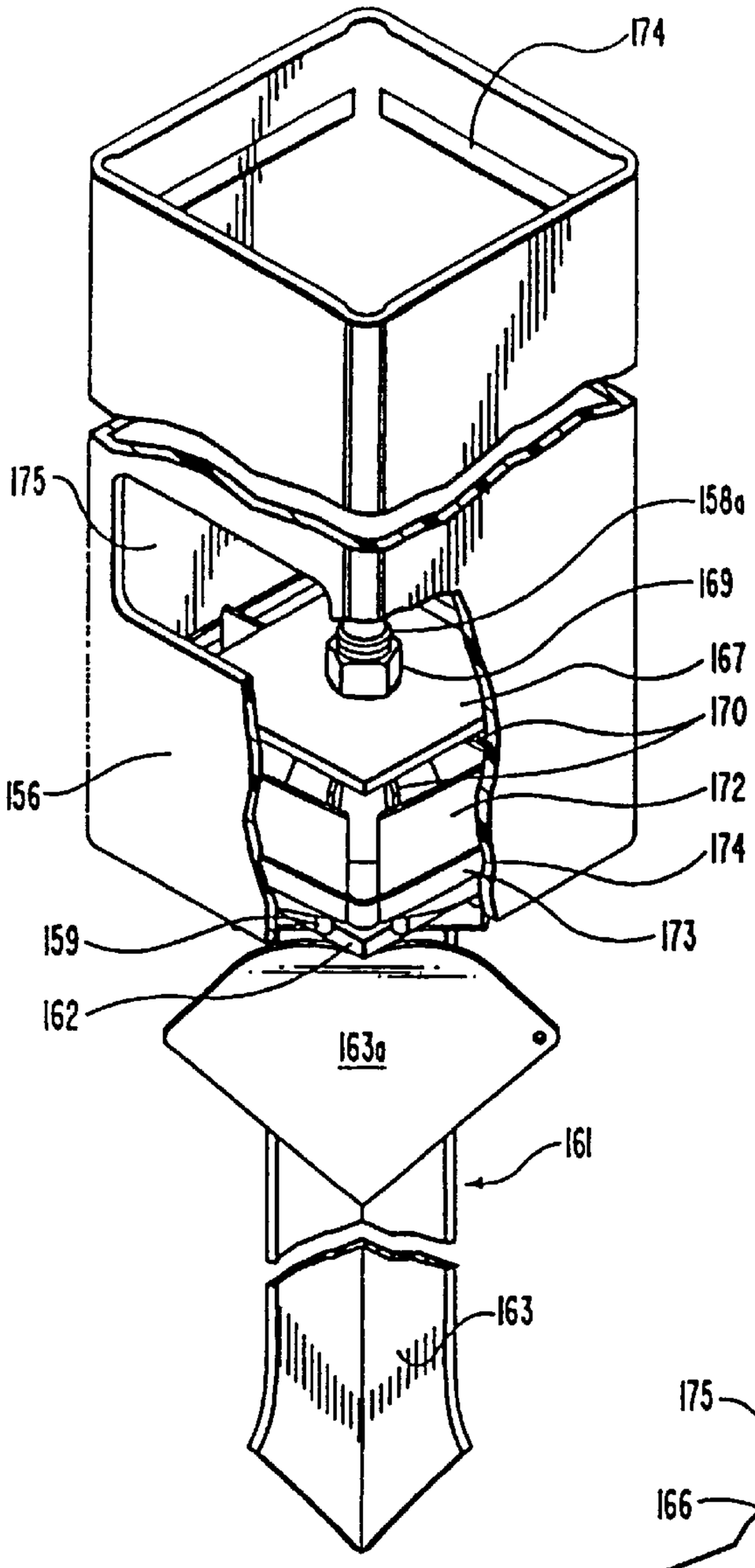
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FIG. 1B

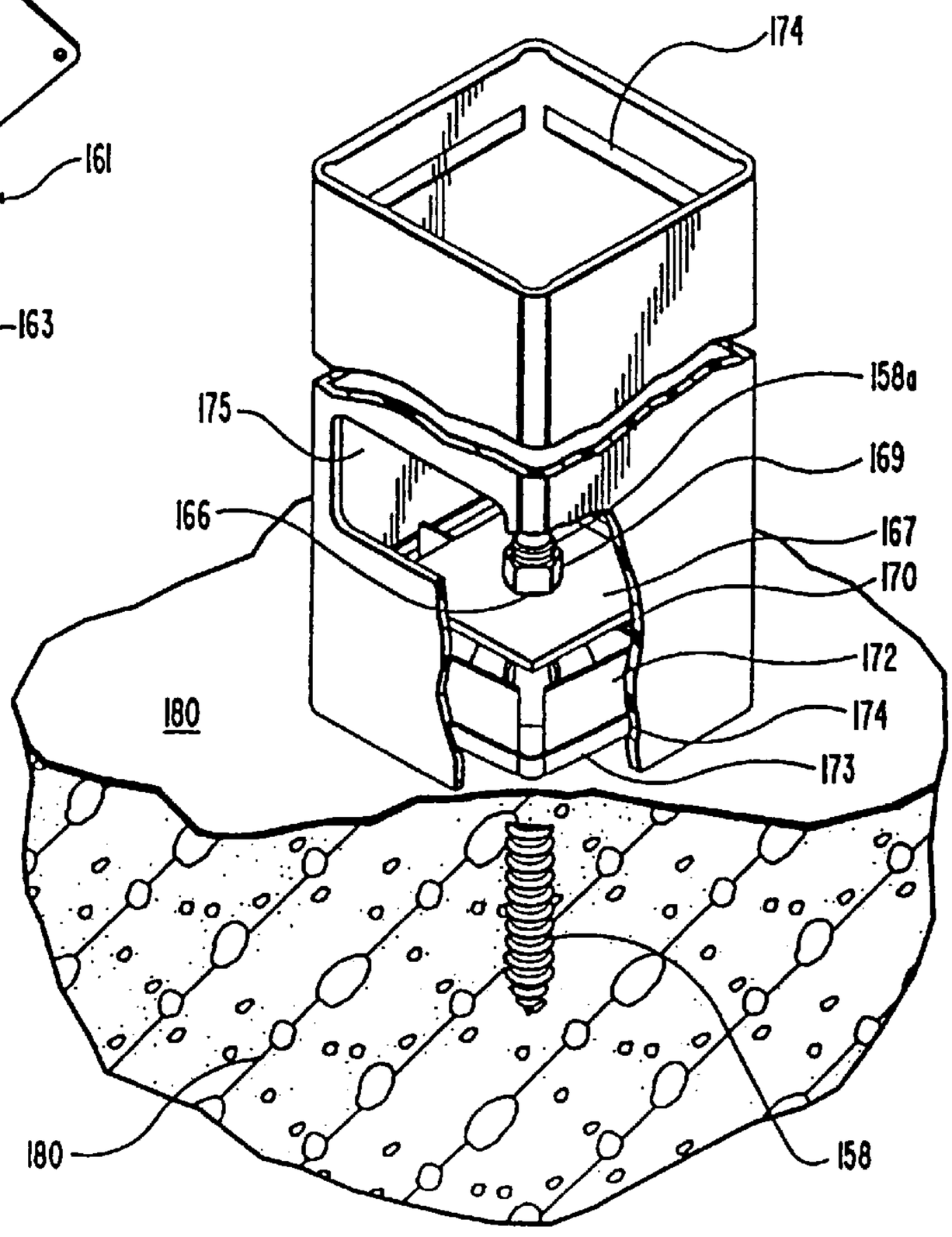
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FIG. 1C

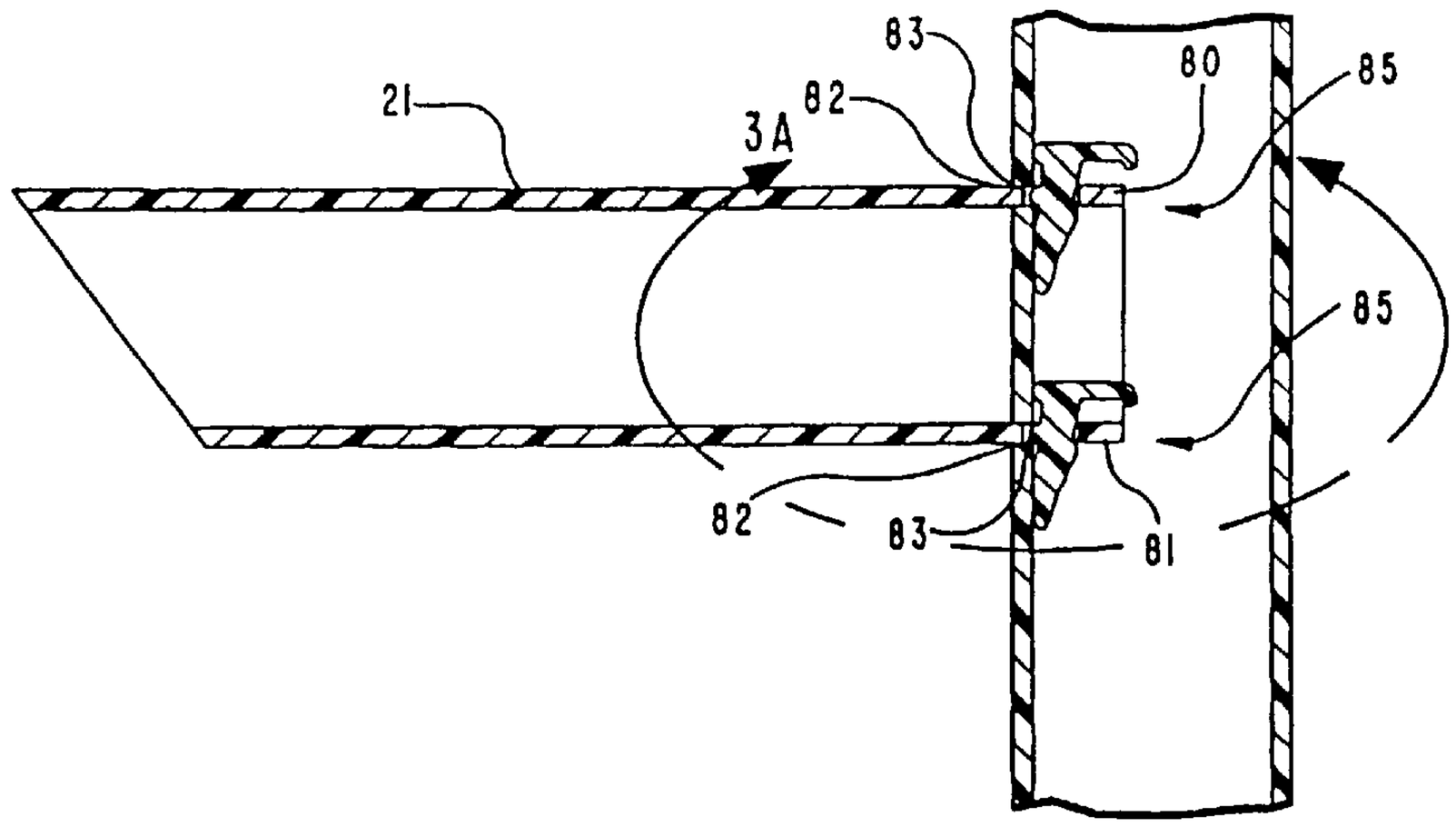


FIG. 2

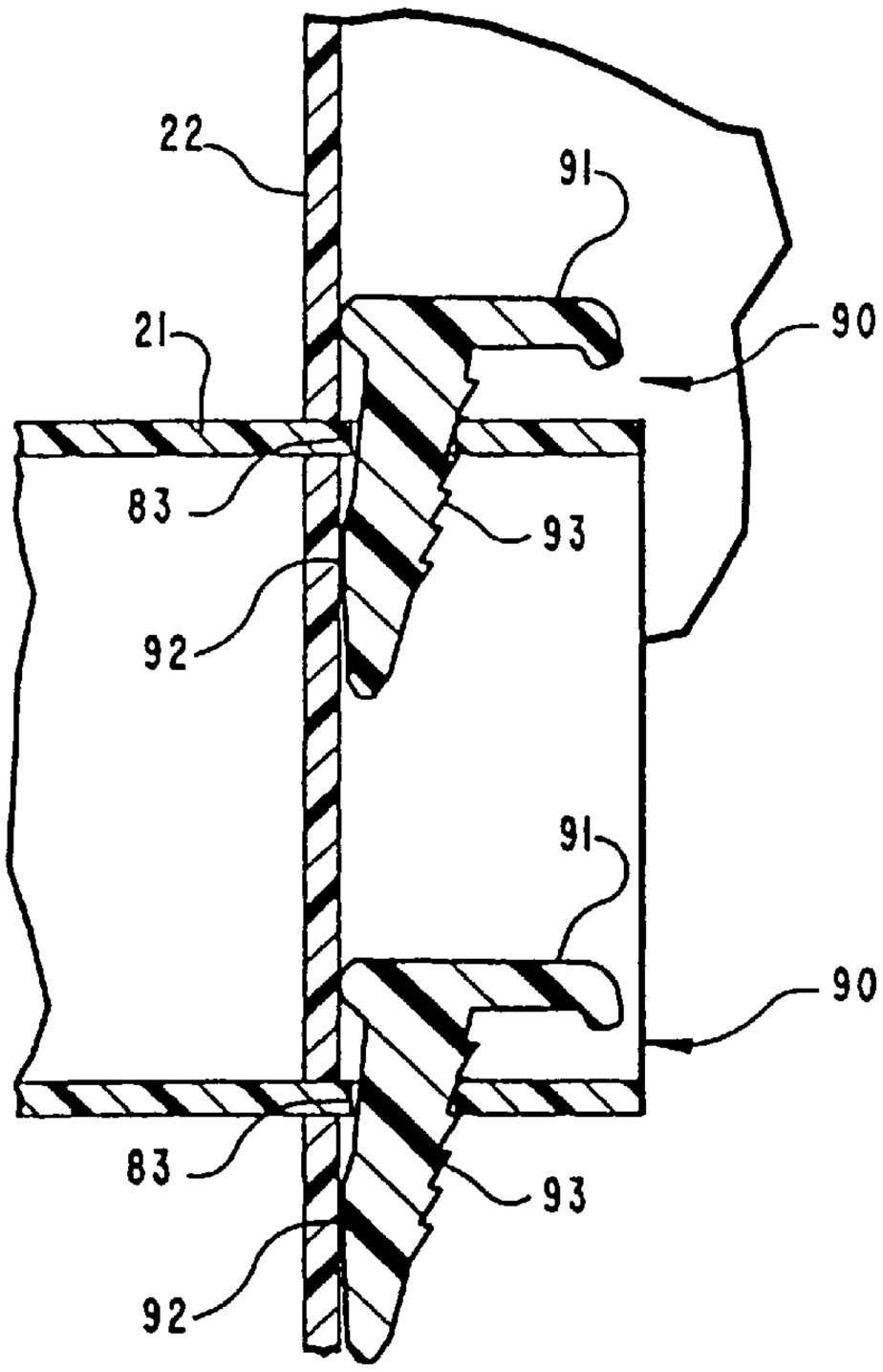


FIG. 3A

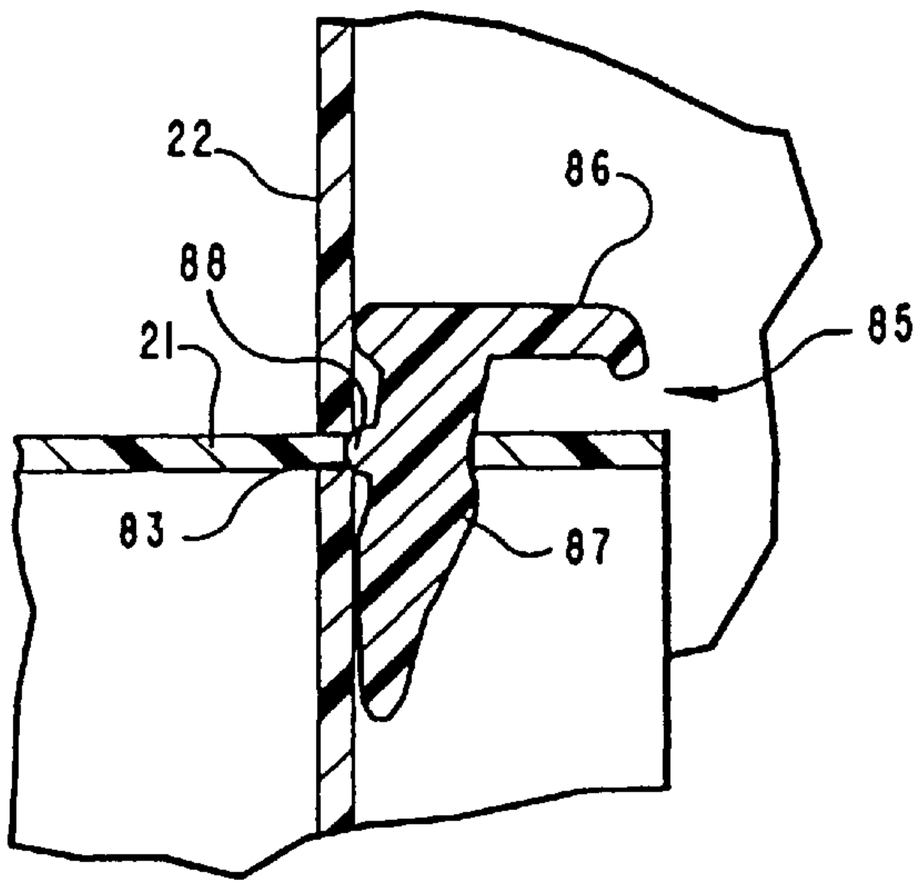
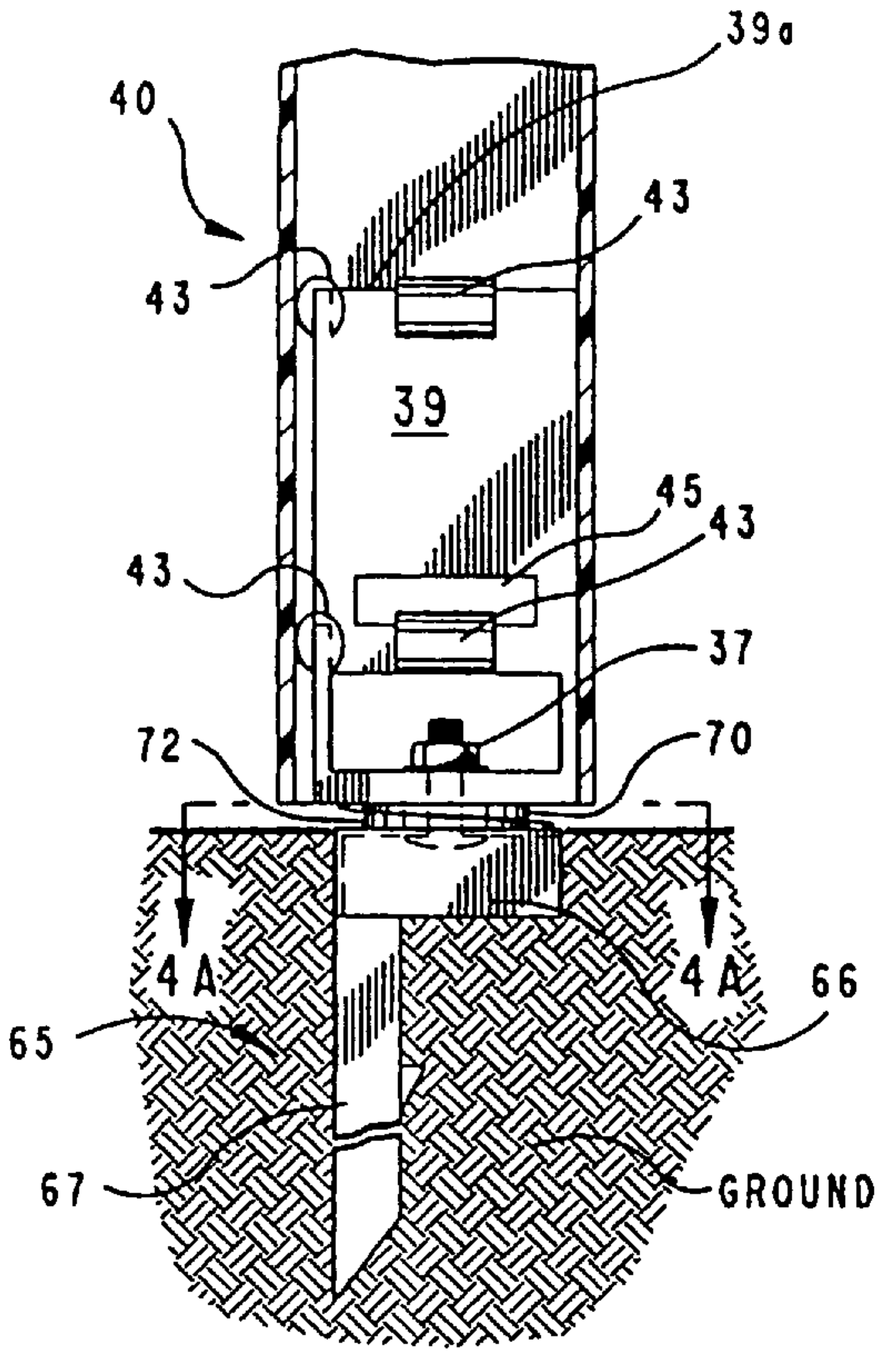


FIG. 3C



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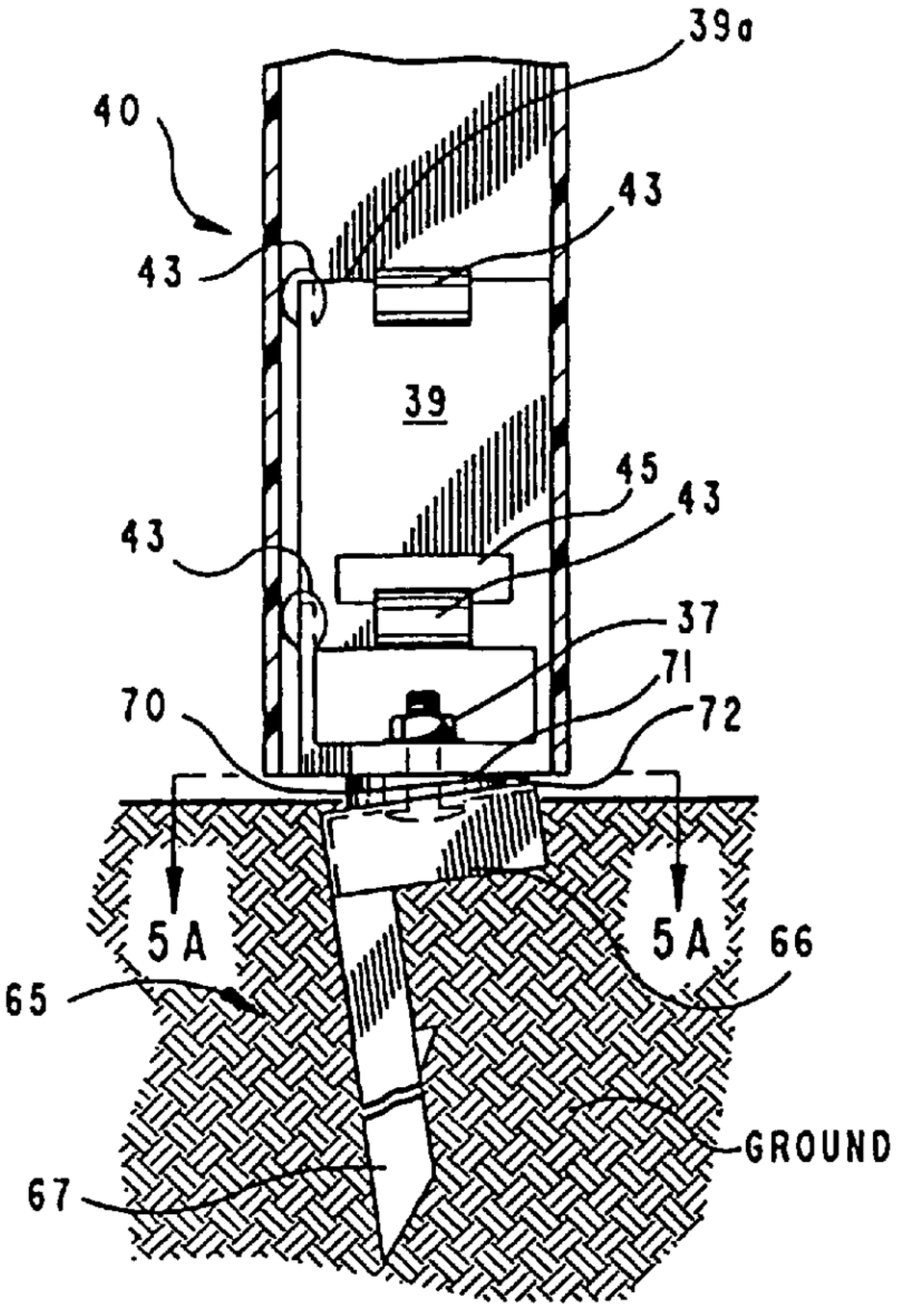

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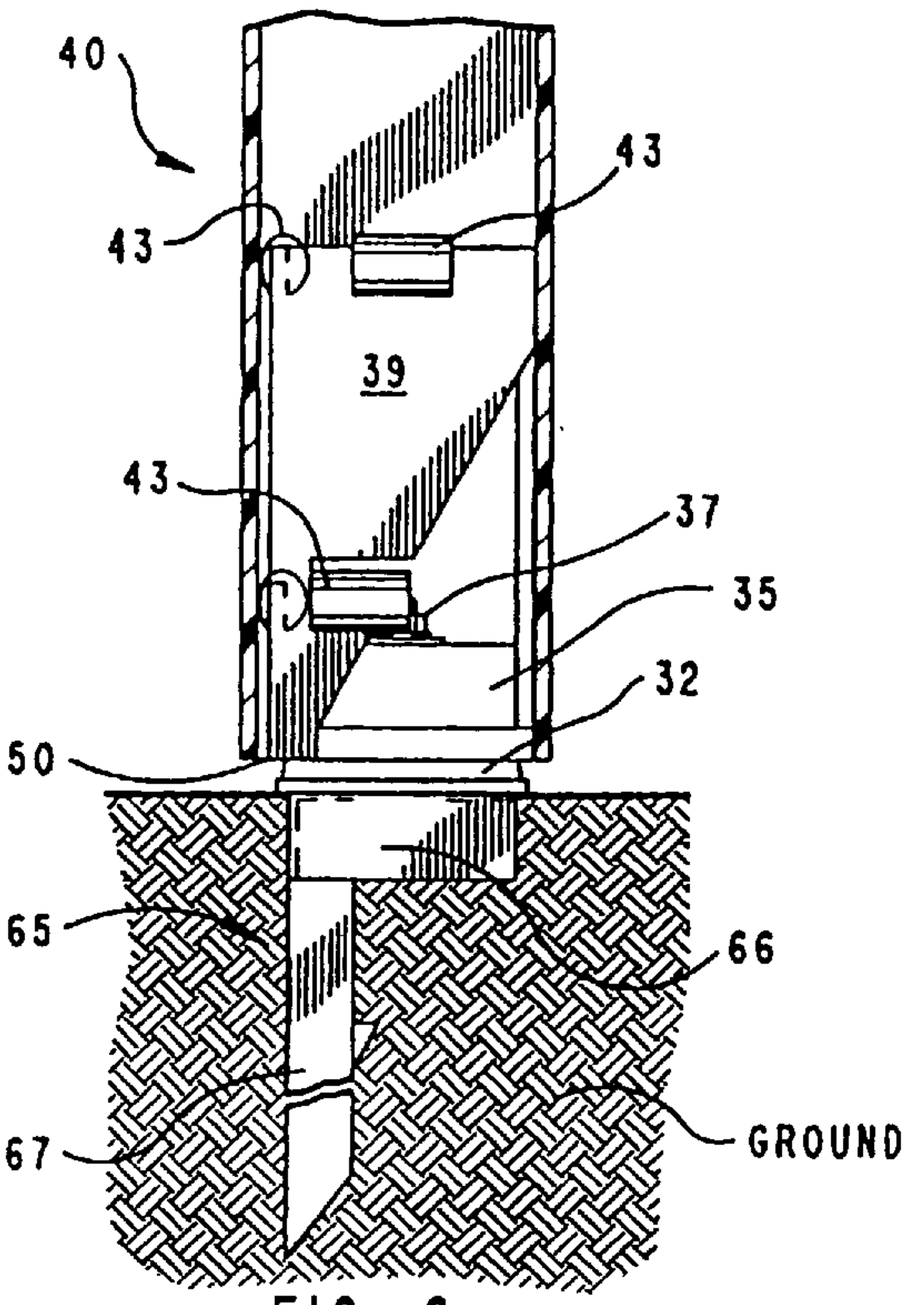
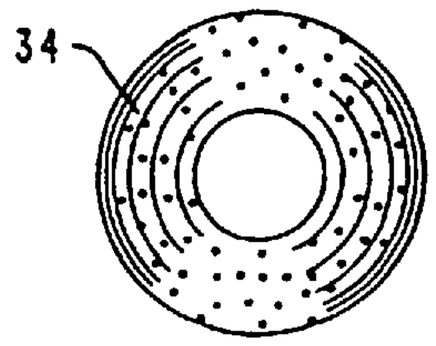


FIG. 6



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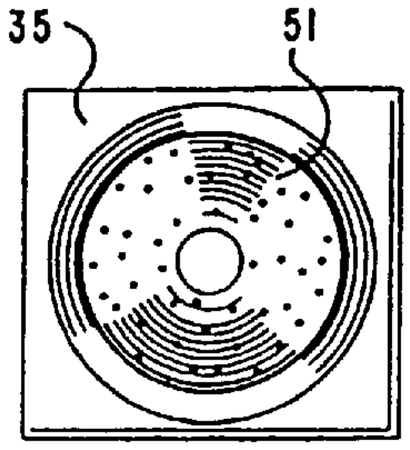
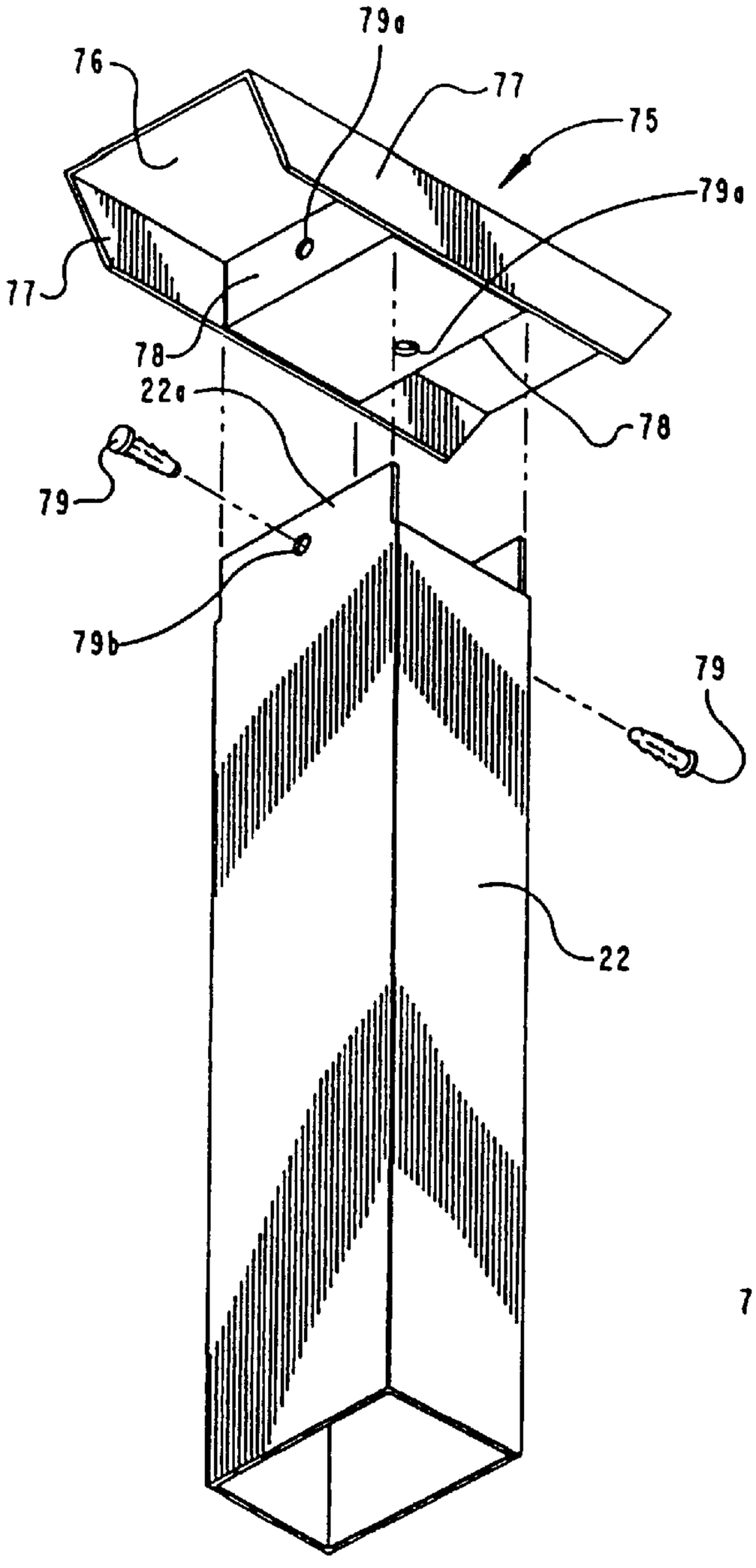


FIG. 9



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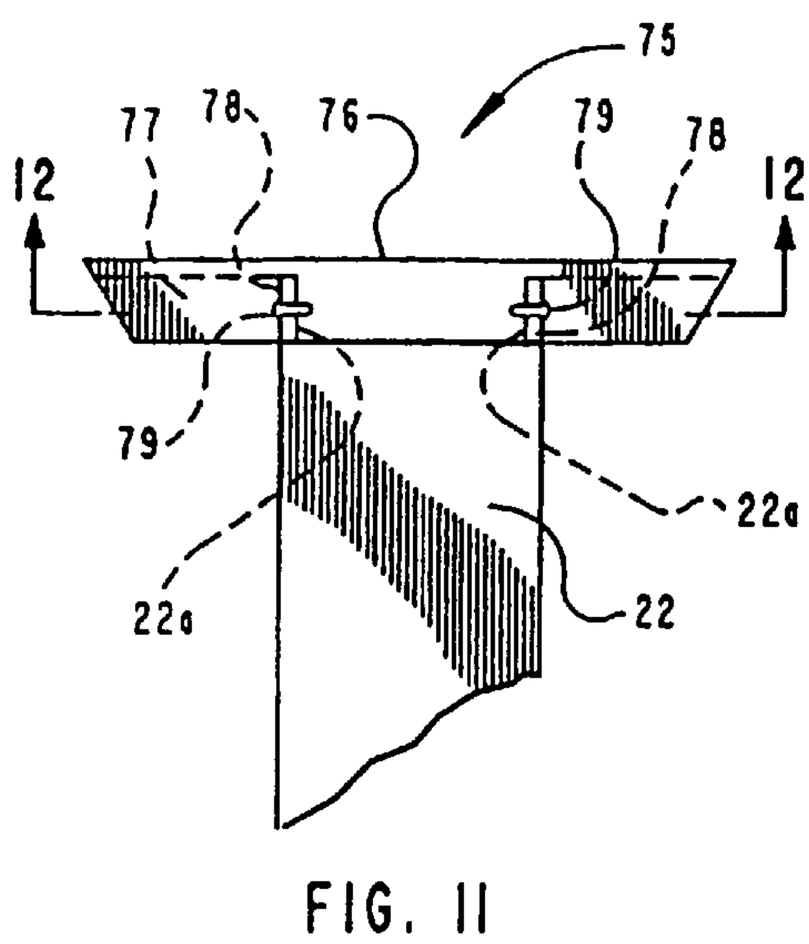


FIG. 11

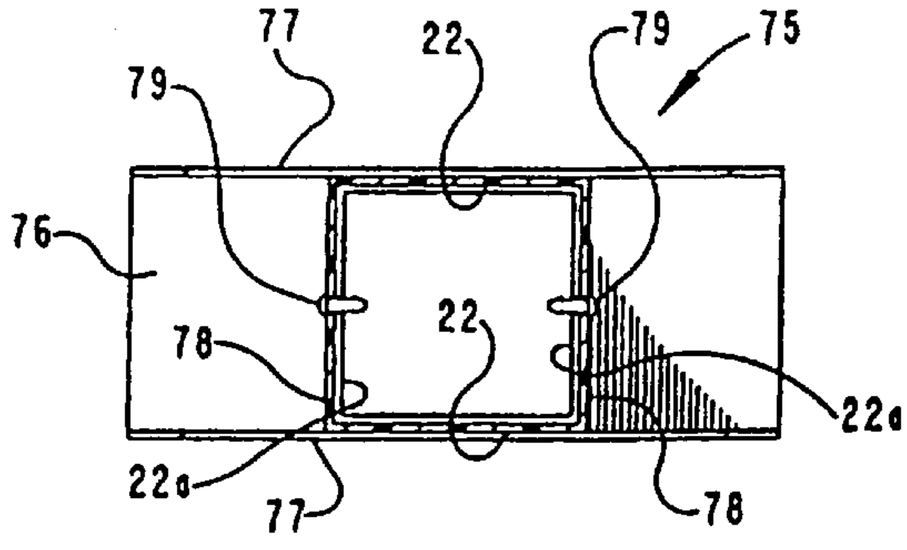


FIG. 12

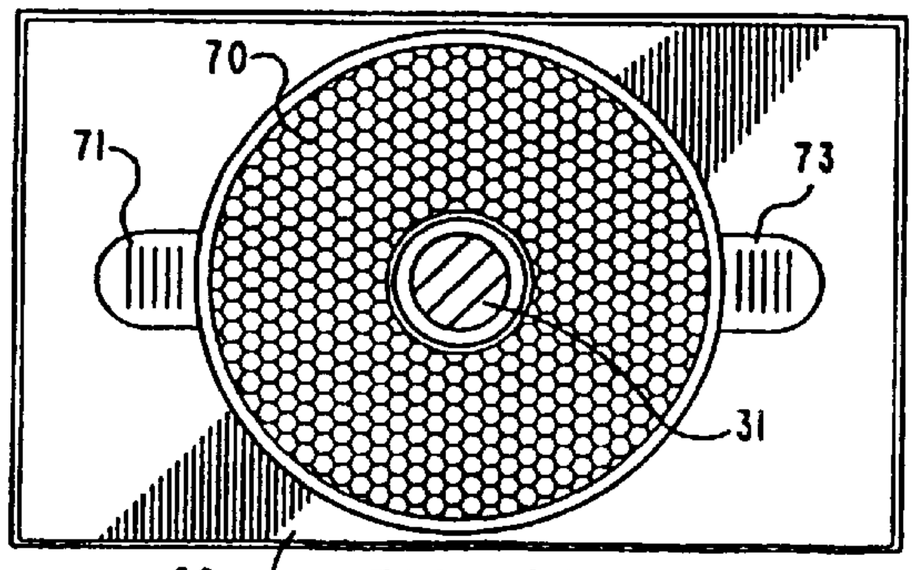


FIG. 4A

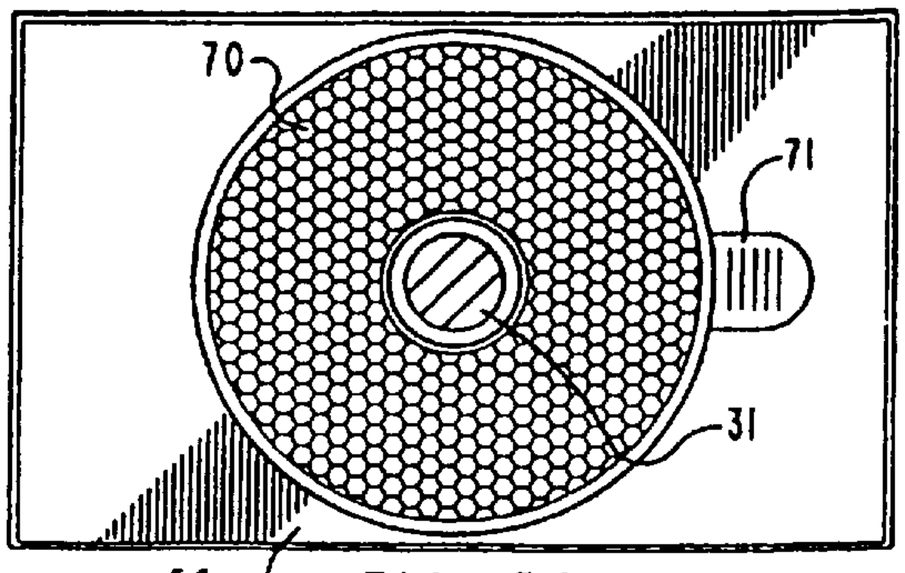
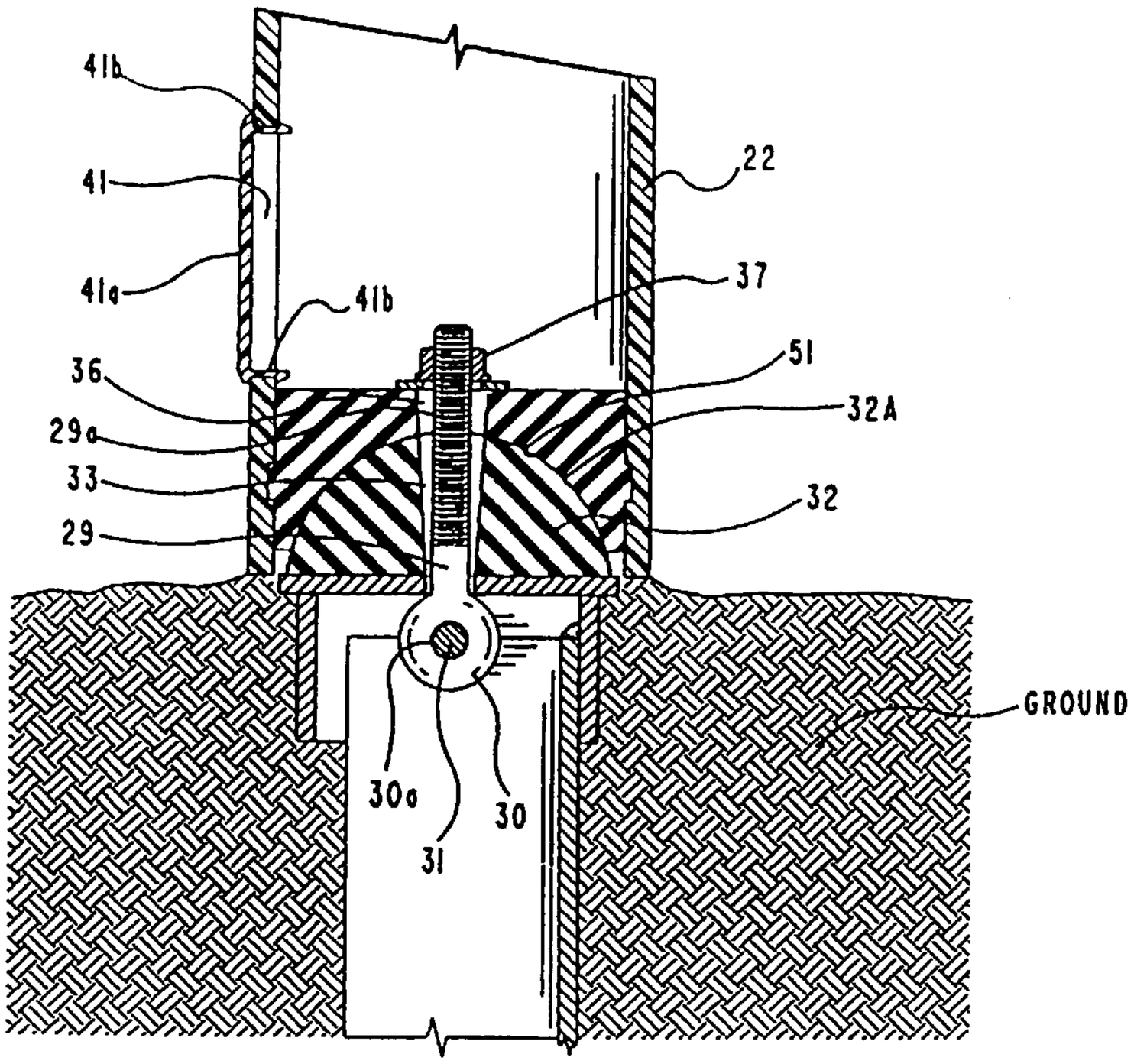


FIG. 5A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GROUND
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FIG. 7

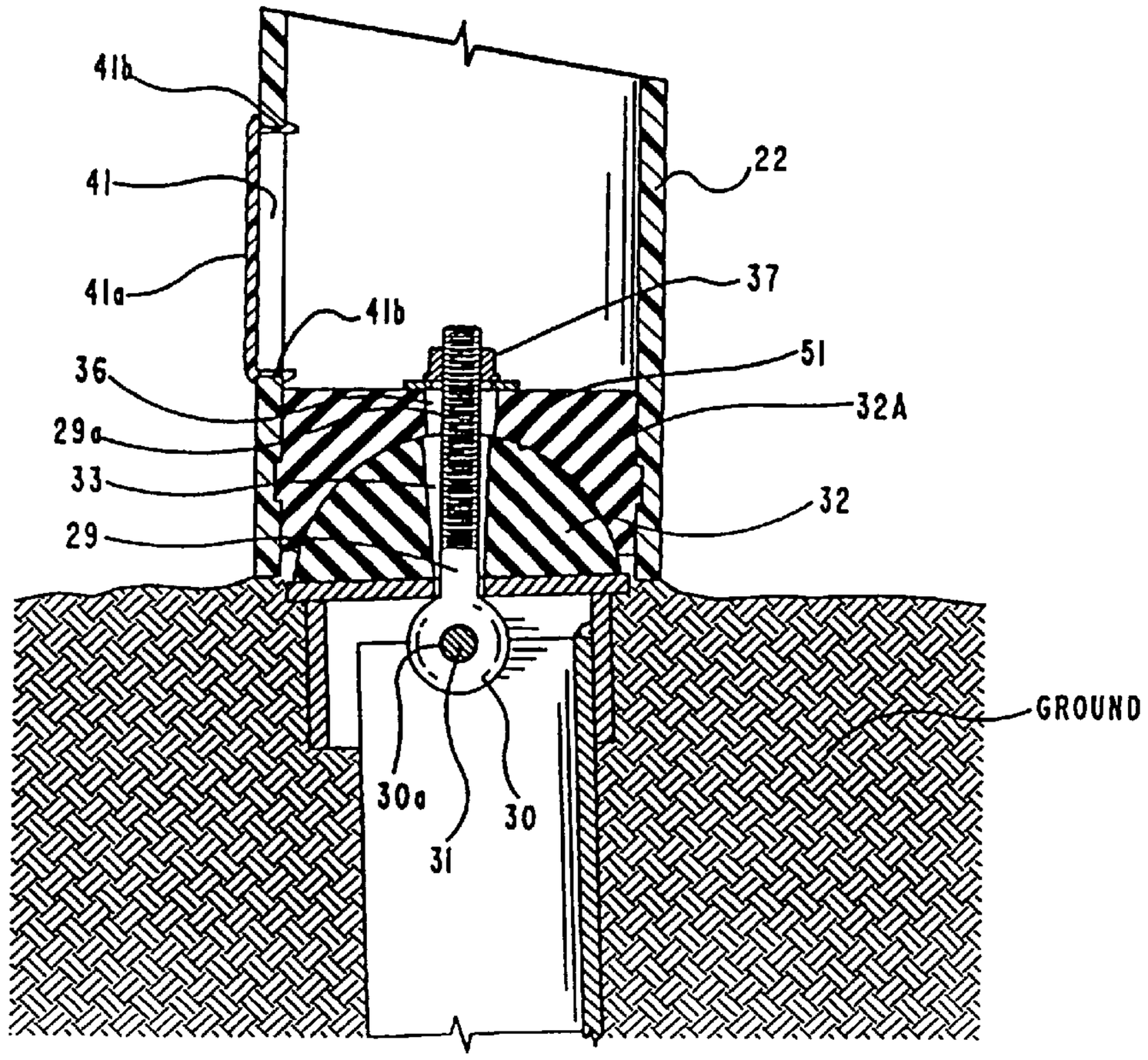
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FIG. 7A

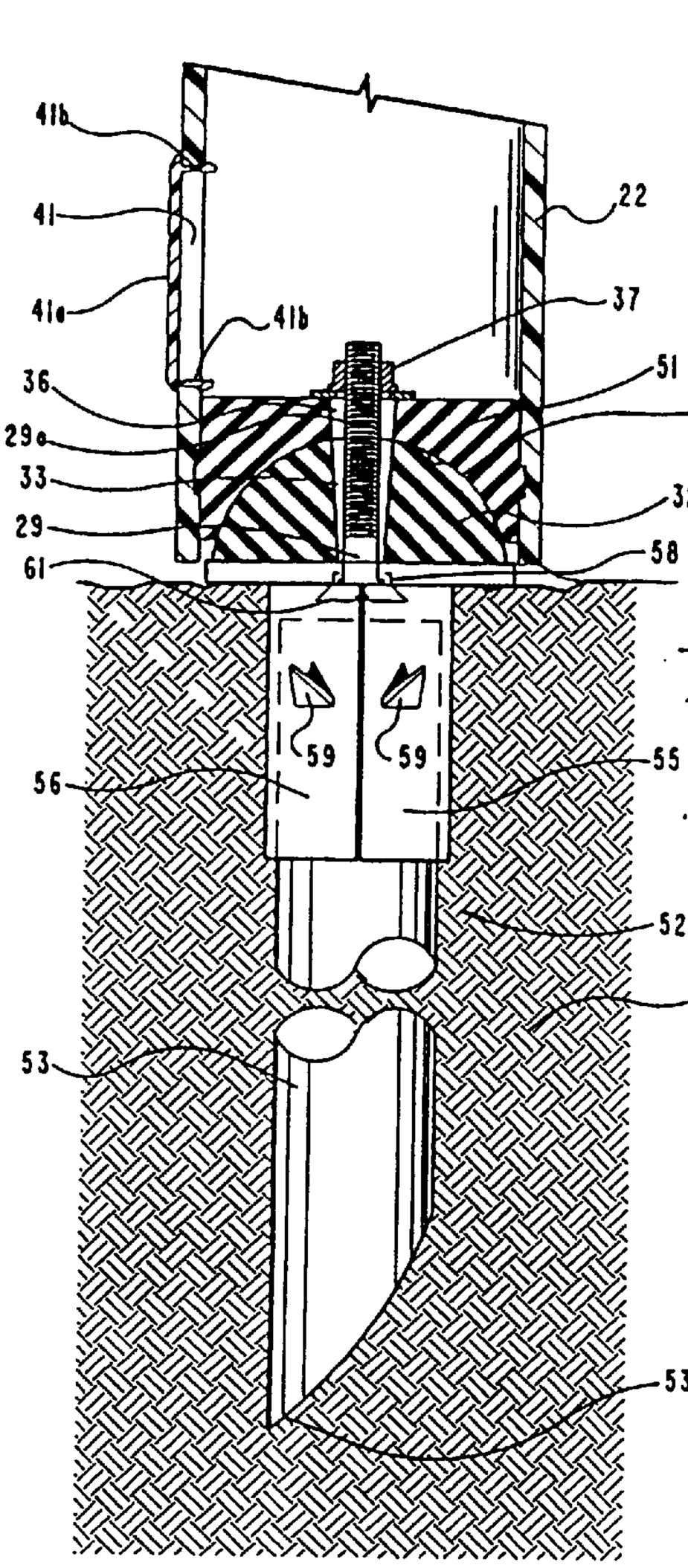


FIG. 13

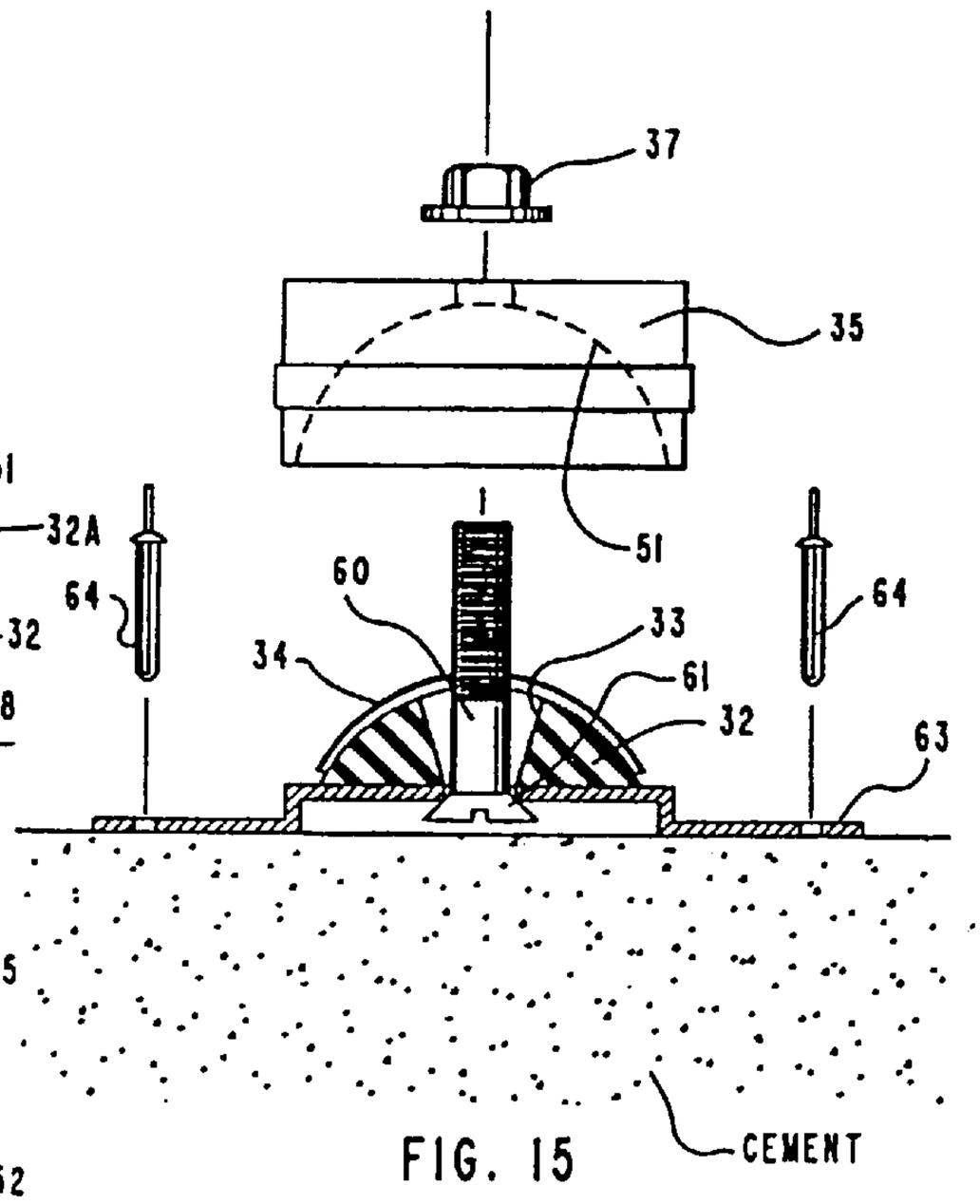


FIG. 15

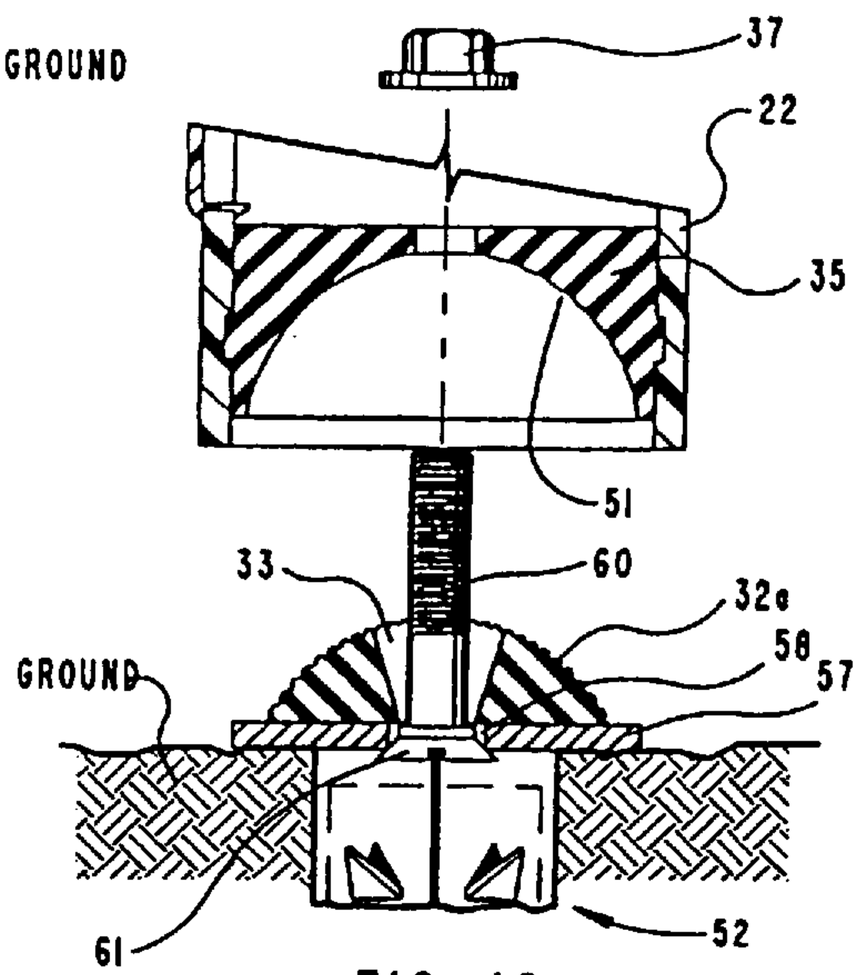
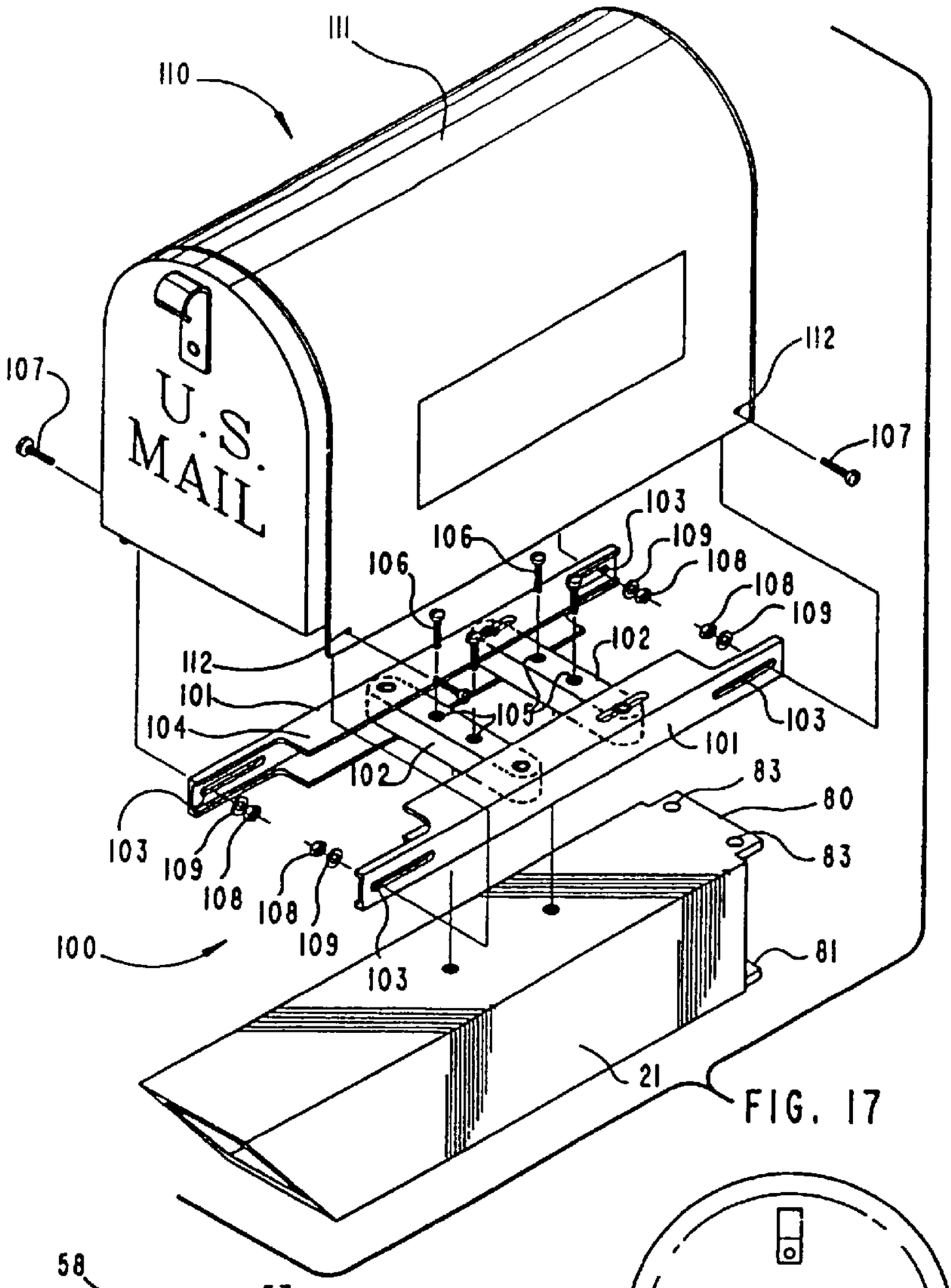


FIG. 16



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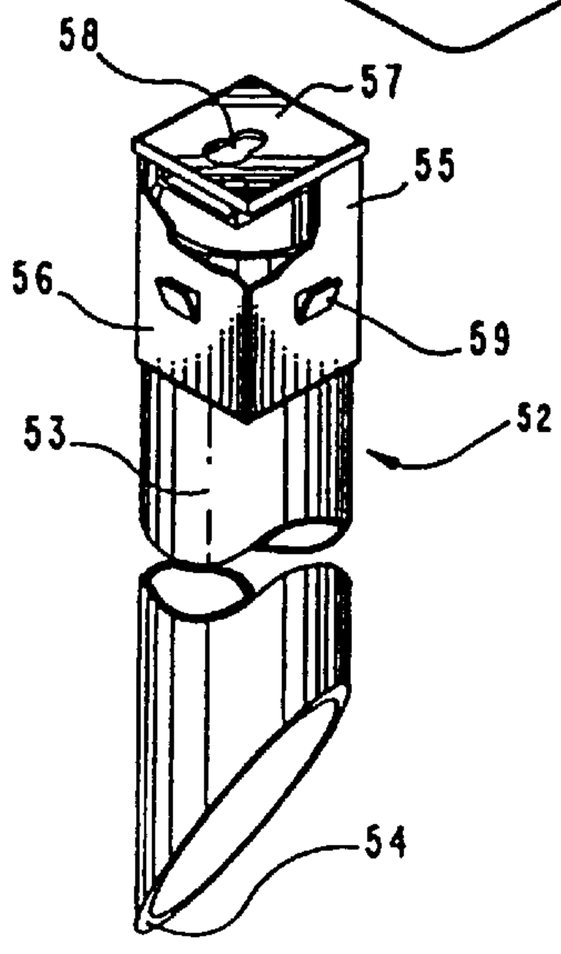

FIG. 14

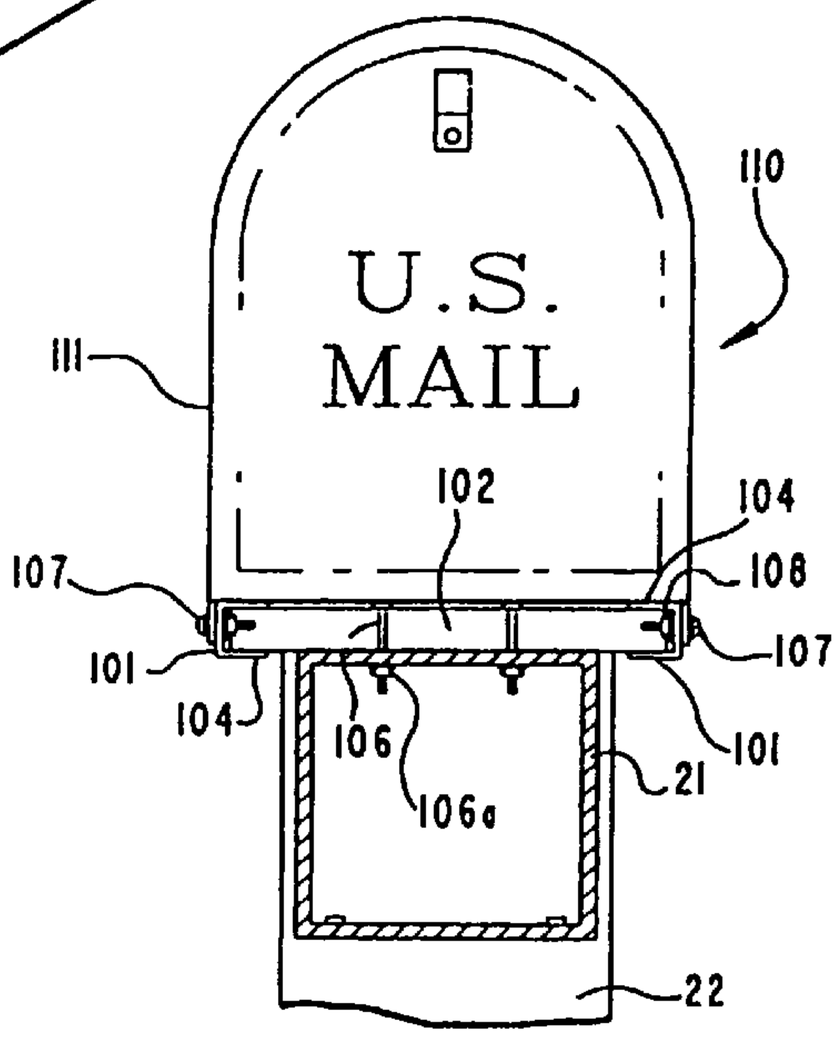

FIG. 18

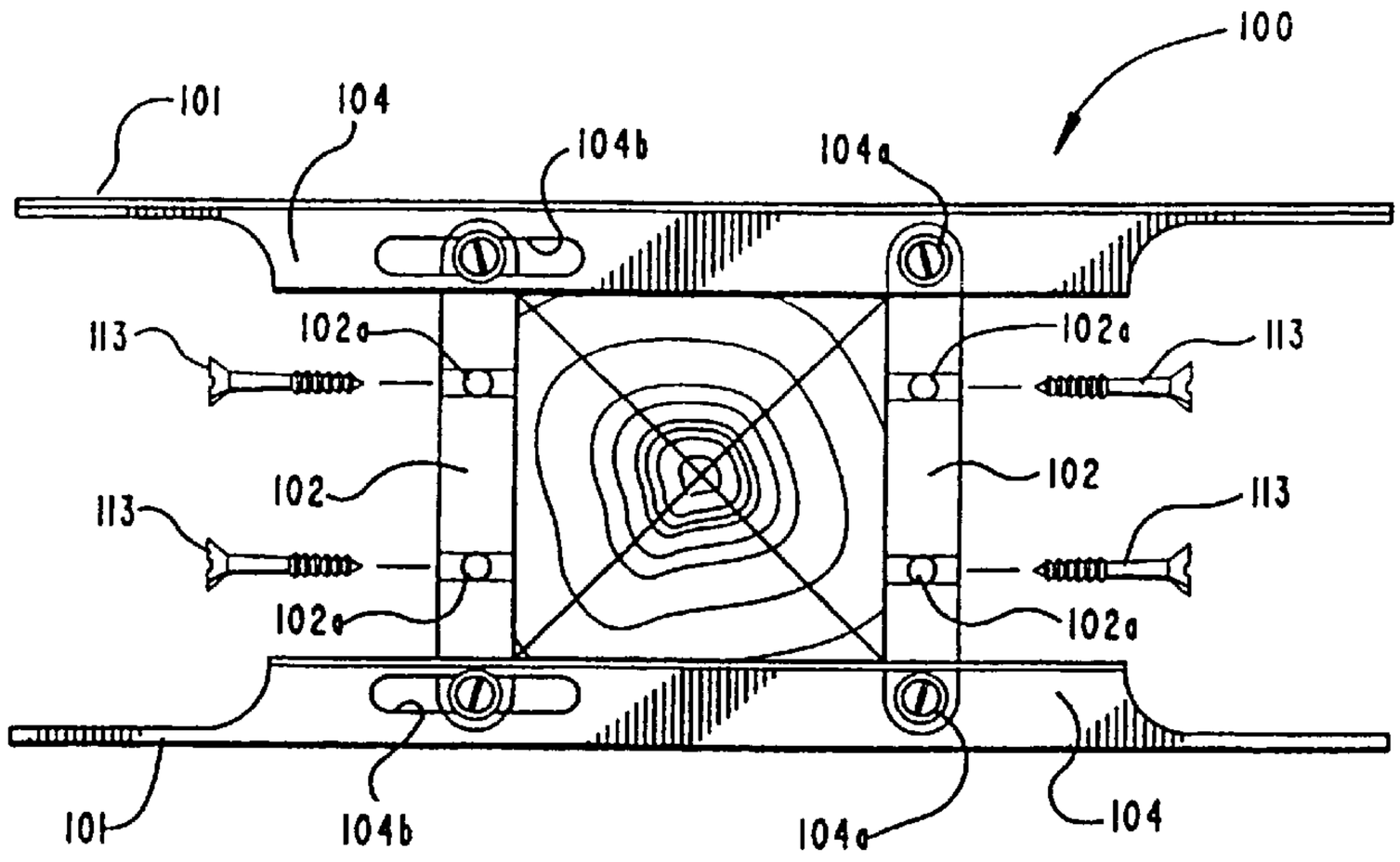
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FIG. 19

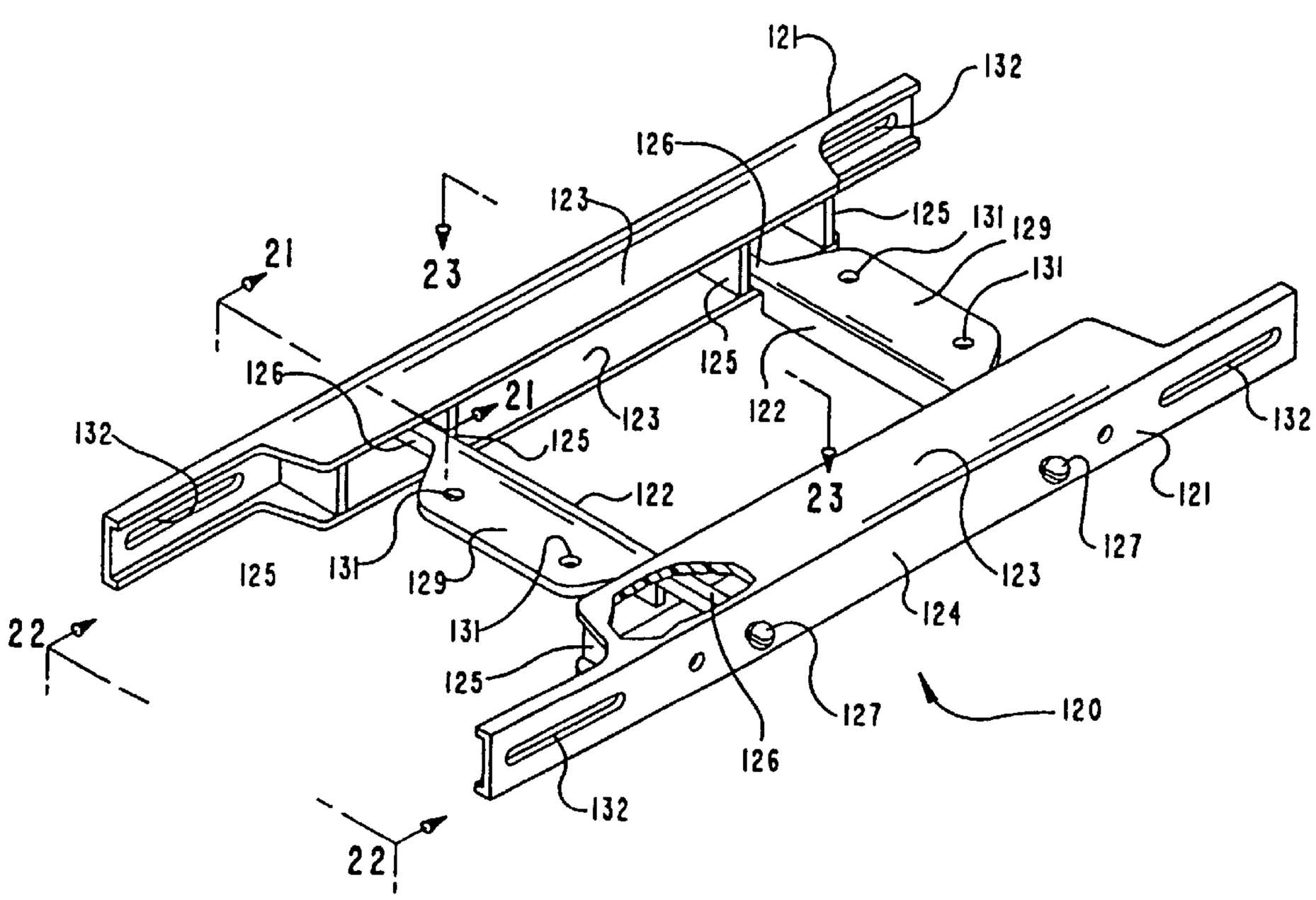
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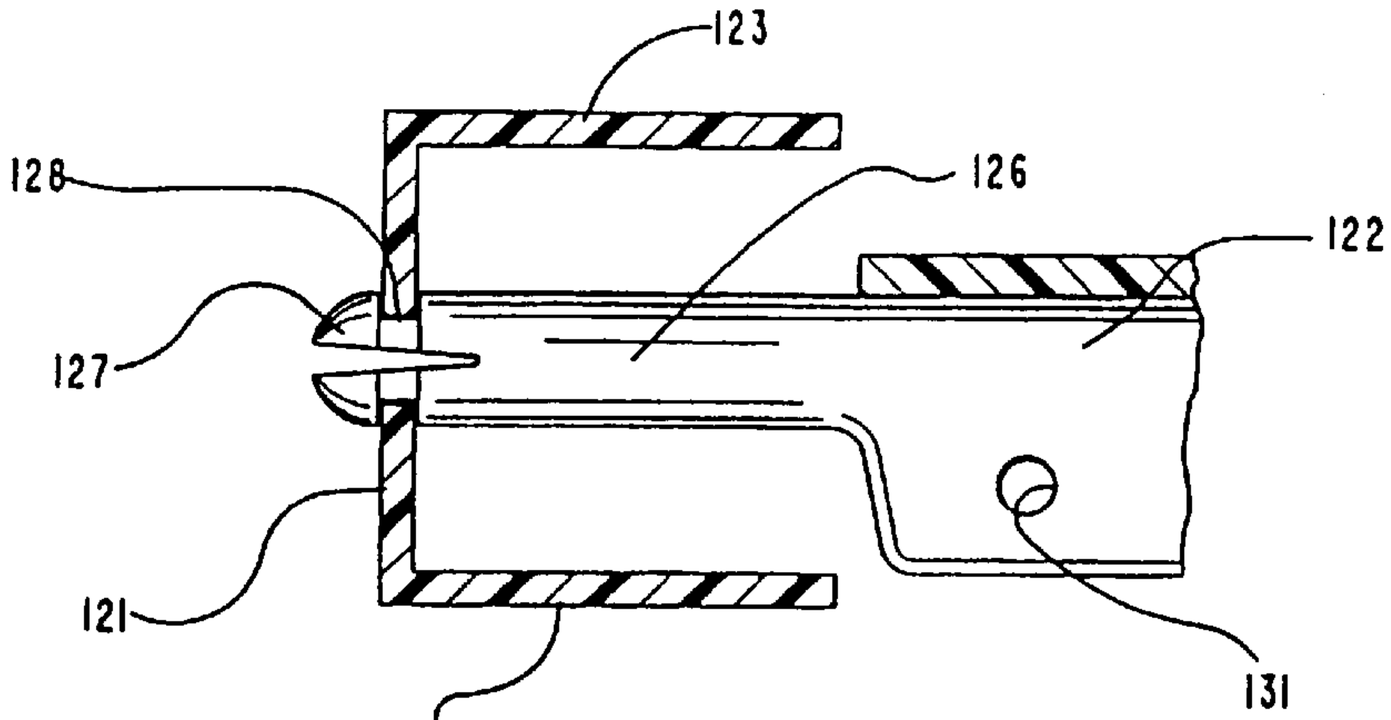
FIG. 20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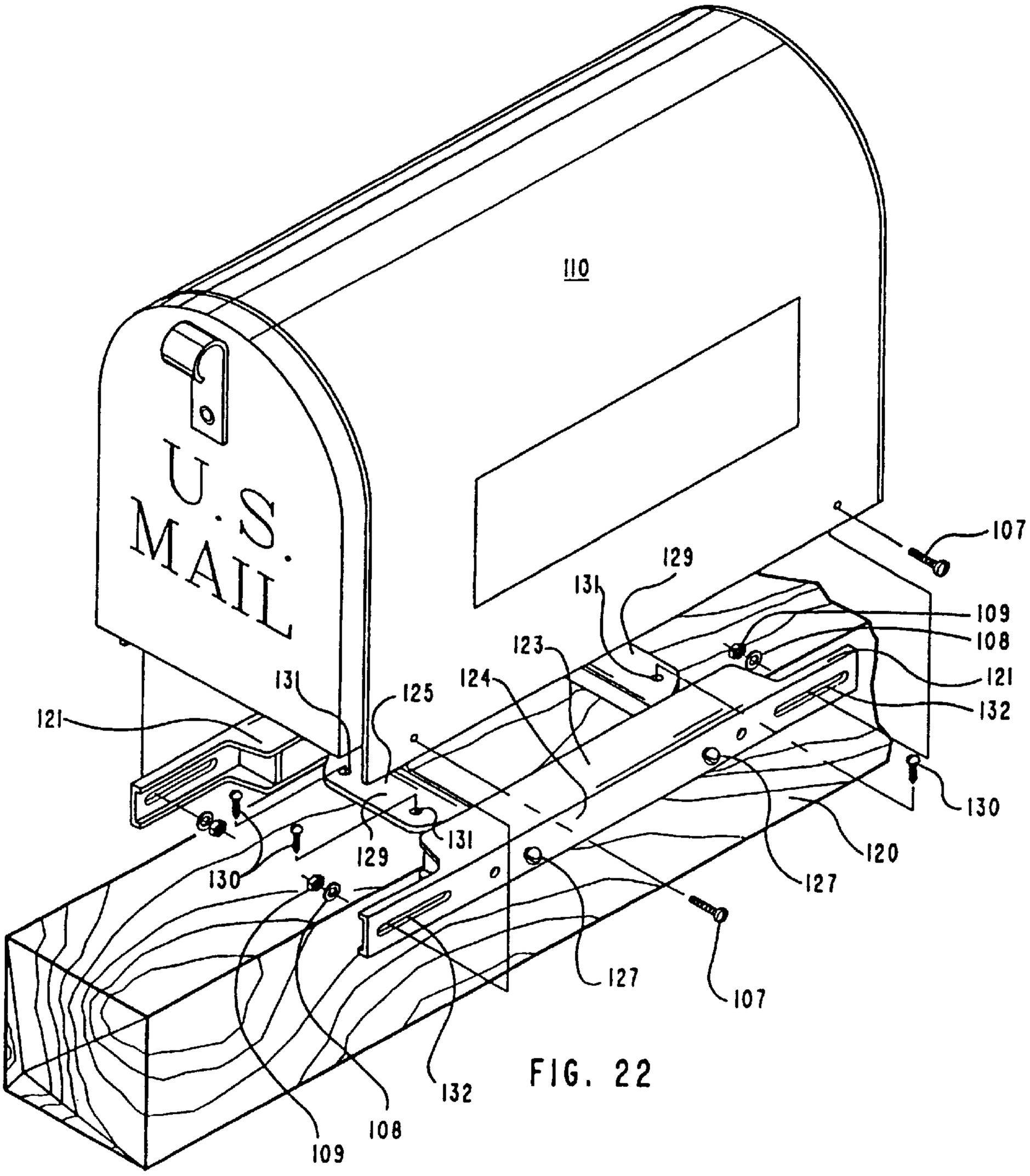
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FIG. 22

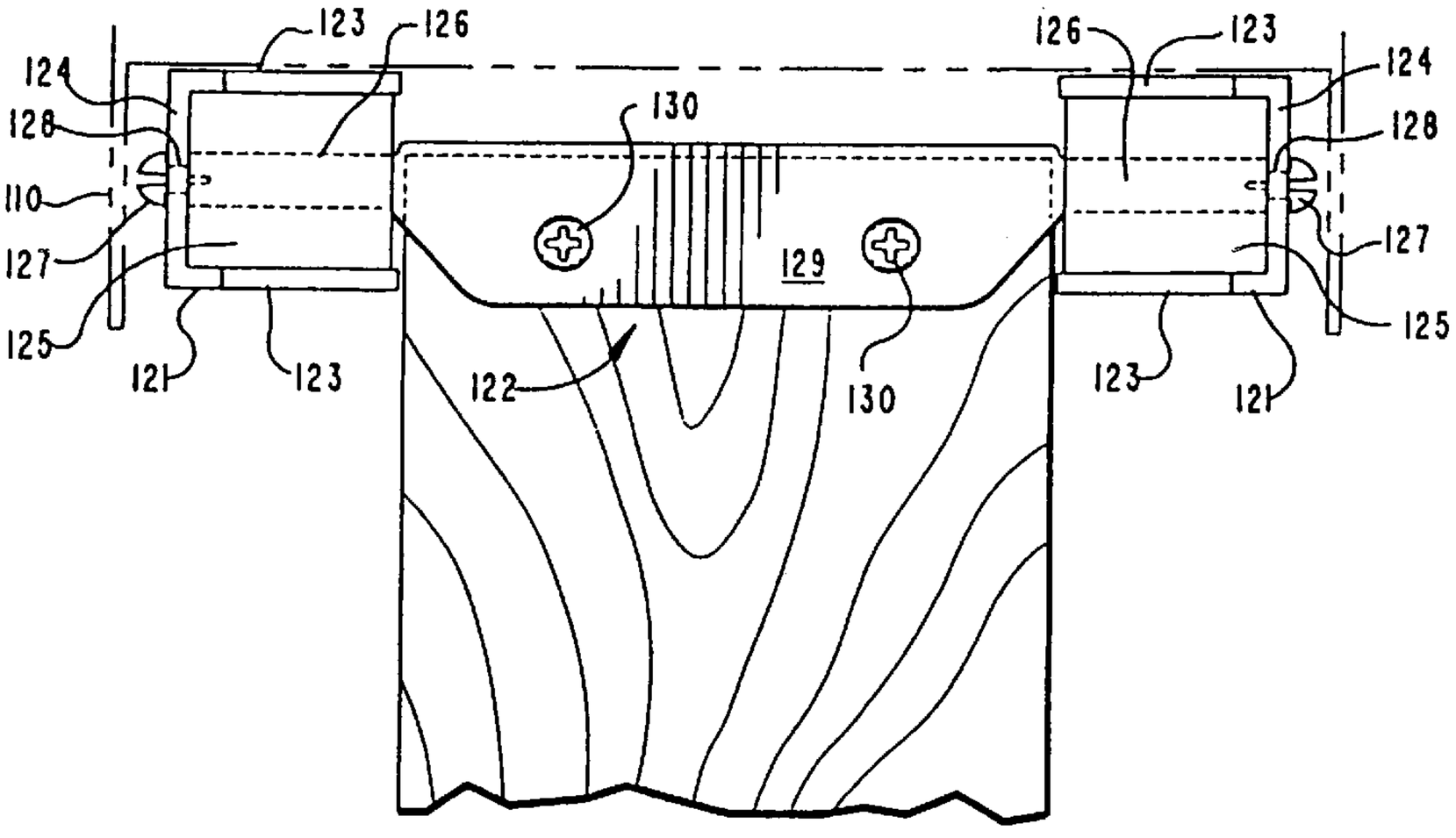
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FIG. 23

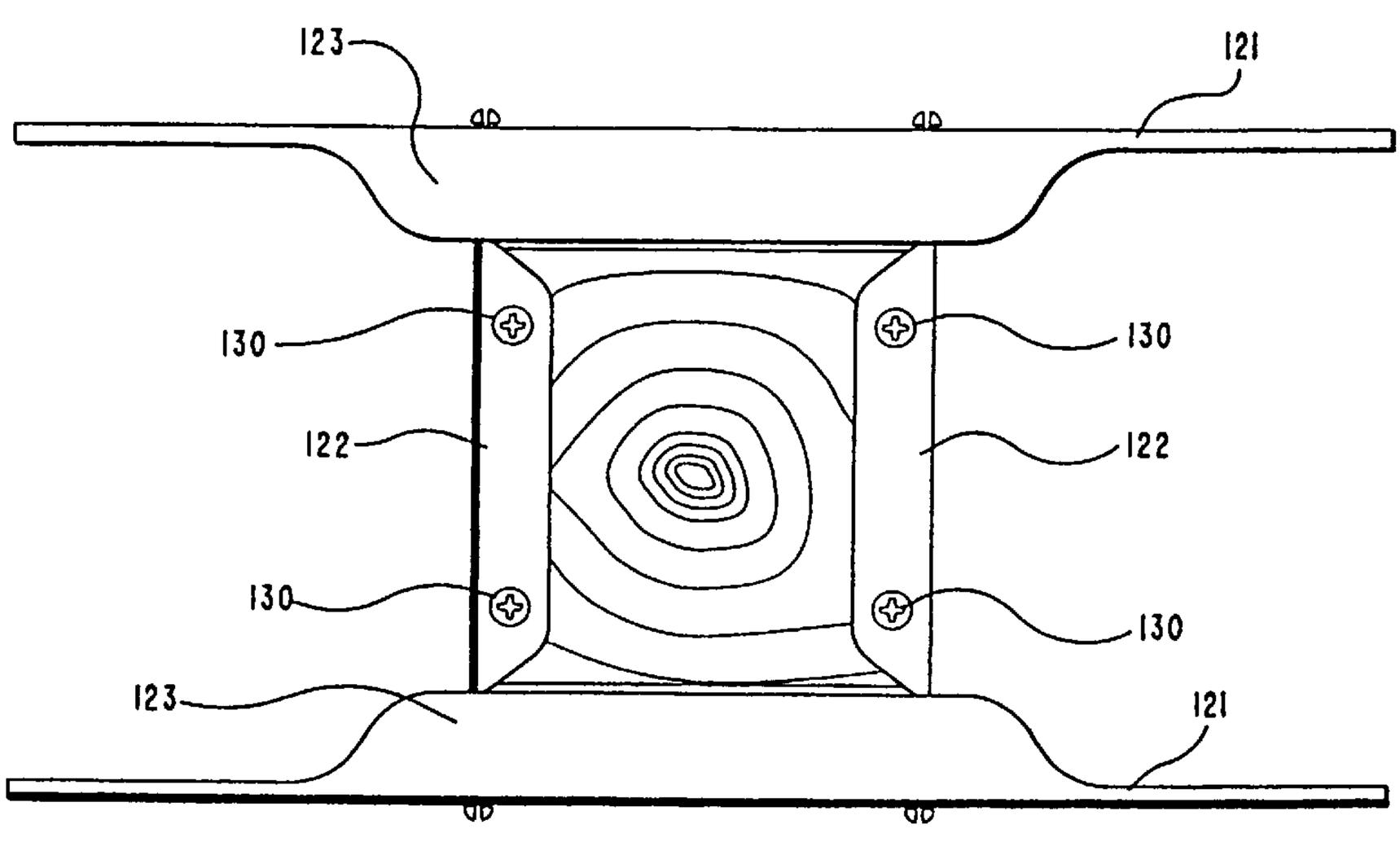
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FIG. 24

ADJUSTABLE MOUNTING FOR A POST SYSTEM

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

This is a division of application Ser. No. 7/856,639, filed Mar. 24, 1992, now U.S. Pat. No. 5,307,598.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention related to adjustable post mountings and in particular to a post ground anchor that is capable of being tilted to bring the post to a desired vertical attitude.

2. Prior Art

Posts and even ground mounting arrangements therefor for adjusting or tilting the post to a vertical attitude are not new. A recent patent to Deike, U.S. Pat. No. 4,603,520, shows an example of a mounting base for a sign post that will accommodate rotational, tilting and height adjustment. Where, like one embodiment the present invention, the Deike patent shows a ball and seat arrangement for providing tilting capability to a sign post, Deike utilizes four corner bolts to maintain that post tilted attitude rather than a ball and seat with a single bolt mounting like that of the present invention. Further, there is no teaching of a mail or newspaper box mounting to the mounting post in the Deike patent.

Additionally, a number of ground anchor arrangements for mounting posts, such as road side type sign posts, have been developed. Examples of such are shown in a U.S. Patents to Galloway, et al, U.S. Pat. No. 3,011,597, that involves an auger type post mount; Smith, U.S. Pat. No. 3,152,668, that teaches an anchor with a guy wire; Brisse, U.S. Pat. No. 3,186,523, that shows a wire anchoring system; Deike, U.S. Pat. Nos. 3,676,965 and 4,320,608, for sign post support sockets; and Klenk, et al U.S. Pat. No. , 4,339,899, that sets out a system for coupling a power transmission tower to a support base. None of which above cited patents involve a post and ground mount for a mail box system, like that of the present invention, whereby the post can be quickly and easily aligned to the vertical and provide for securely mounting a mail box, or the like, onto which post.

Additional to the above cited U.S. patents, a ball and socket mount utilizing a single bolt and nut combination for positioning and securing a transit to a horizontal attitude is provided in a transit system identified as an automatic level, manufactured by Nikon Corp. of Japan, Manufacturers Part No. AX-1 and AX-1S. Which Nikon system is, of course, for a different use and application than the arrangement of the system of the present invention.

SUMMARY OF THE INVENTION

It is a principal object of the present invention in an adjustable post mounting system to provide a system for mounting a straight post to a ground anchor that includes a capability for adjusting and maintaining the post to a desired vertical attitude relative to the ground surface.

Another object of the present invention is to provide, an adjustable mount for use with a ground anchor whereby the post can be set to a desired vertical attitude with respect to the ground surface and secured thereat by a single nut and bolt type coupling.

Another object of the present invention is to provide an adjustable mounting that includes at least a pair of members whose positioning relative to one another allows for providing a tilting of the post to correct for ground conditions, which relative positioning is maintained by a single bolt and nut coupling.

Another object of the present invention is to provide an arrangement of a ground mount for coupling to a post, the combination to provide a tight and secure coupling.

Still another object of the present invention is to provide a simple adjustable mounting for a post system where the individual components can be produced from an inexpensive and durable material, such as plastic, which system provides for ease of installation by a person with only simple tools and requires little or no mechanical skills.

The present invention is in an inexpensive, simple to install and yet durable post system. The post system includes a ball section or portion of an adjustable mount that can be fitted onto a ground stake that is to be driven into the earth, can be mounted to cement, or the like. The ball portion of the adjustable mount is for positioning in a seat that is for coupling to a post insert or into a post end. Both the post and post insert attitude to the vertical is adjustable and is maintained by a mounting that utilizes single nut and bolt fastener.

In one embodiment of the invention, the adjustable mount is a ball section and seat combination, where the ball section is maintained onto the top of a ground stake or anchor. The ball section is to fit into a seat that has a hemispherical inner surface with the components positioned and held together by a single bolt coupling. The bolt is fitted through a hole formed through the seat and ball section, which ball section hole is tapered from a bottom end outwardly to a top end to allow for the bolt to tilt across the top end of the hole. So arranged, the seat is positionable across the ball section surface and a nut is provided for turning, within the post insert, over a threaded end of the bolt passed through the seat and ball section clamping the surfaces together. Alternatively, a friction gasket can be included therebetween, or the ball section surface can be grooved or scored for providing non-slip coupling surfaces.

A second embodiment of which adjustable mounting involves a pair of sloping or tapered washers that are center holed to fit together as a stack and receive a bolt therethrough. Which bolt is also fitted through holes formed in opposing plates that are secured respectively, across the post insert bottom and the ground stake or anchor top surface. The washers fitted over one another have their tapered surface arranged juxtaposition to one another. The rotation of one of which washers over the other therefore increases or decreases, respectively, the thickness of the opposite washer stack edge. The washer stack top surface can therefore be angled to the vertical relative to its lower surface. Which angle translates to a tilt of the post, and is maintained by turning a nut over which bolt threaded end.

The post insert is for receiving an end of a post, such as a post for mounting a mail box, fitted thereover. For which coupling, screw holes are formed through both the post and post insert that, with the post telescoped thereon, align to receive screws turned therethrough, securing the components together. Resilient spacers are preferably arranged between the opposing surfaces of which post and post insert to provide a tight coupling. Alternatively, the ball seat can be imbedded directly into the bottom of the post to eliminate the post insert.

Another embodiment of an adjustable mounting, like that of the first embodiment, involves a ball and seat combina-

tion. Like the adjustable mounting of the first embodiment, a ball section that is for mounting through a plate to a ground stake is arranged to pass a mounting bolt through a center hole thereof to through a seat to provide a tilt from the vertical of that mounting bolt. That, with the mounting bolt to fitted through a seat, is translated to a displacement of the seat across the ball section seated therein. The bolt, after passage through the seat, is to receive a nut turned thereover, for clamping the ball section in the seat as the adjustable mounting. A ridge is preferably formed around body that contains the seat that is for snap fitting and locking into a slot that has been formed around the inside surface of the post, proximate to a lower end thereof. Which post further includes a window or port formed therein, for providing access into the tube for fitting and turning a nut onto the bolt threaded end that has passed through a center hole in the seat for clamping the ball section in the seat. In this embodiment, like the first embodiment, the opposing ball section and seat surfaces can be scored, or the like, to discourage movement of the one surface over the other, and a washer with a rough surface can be sandwiched between the surfaces also for discouraging relative movement after the ball section and seat surfaces are clamped together.

The post can receive a mail box, or the like, secured across a top end thereof, may mount an open newspaper tube cantilevered thereto, may be arranged as a fence post, or may be utilized for any function involving or requiring an upright, ground mounted post within the scope of this disclosure. A preferred cantilevered mounting is provided by horizontally slotting the mail box post with a pair of parallel slots that are each to receive one of a pair of tabs formed as extensions of the tube end. Which tabs are holed, each hole to receive a sloping peg that is fitted therethrough. The pegs are arranged for binding across the tab holes to inhibit withdrawal.

A mail box can be secured across the post top end utilizing a mount that includes a recess formed in the mount under-surface for receiving the post end, with screws turned through the contacting surfaces. Or, a frame for mount the mail box to the post end can be employed that is secured across the post end.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects and features of the invention will become more apparent from the following description in which the invention is described in detail in conjunction with the accompanying drawings.

FIG. **1** shows an exploded side elevation perspective view of one embodiment of an adjustable mounting for a post system of the present invention shown as a ball segment and seat maintained to a ground stake and a tube cantilever mounted to an upper end thereof;

FIG. **1**A is an exploded side elevation perspective view like that of FIG. **1**, showing another embodiment of an adjustable mounting for a post system of the present invention as including a ball segment and seat maintained to a ground stake and supporting a post thereto, which post is shown with a mid-section removed therefrom;

FIG. **1**B shows an assembled view of the adjustable mounting, ground stake, and post of FIG. **1**A;

FIG. **1**C shows an assembled view of the adjustable mounting of FIGS. **1**A and **1**B, and showing the seat mounted directly onto a flat concrete surface;

FIG. **2** shows a side elevation sectional view of an upper post portion and tube of FIG. **1**;

FIG. **3**A shows a side elevational sectional view taken within the line **3**—**3** of FIG. **2**;

FIG. **3**B shows an enlarged side elevation view of a peg of FIGS. **2** and **3**A taken within the line **3**B—**3**B of FIG. **3**A;

FIG. **3**C shows a view like that of FIG. **3**B only showing another peg embodiment;

FIG. **4** shows a side elevation sectional view of another ground stake, post insert with post segment showing another embodiment of an adjustable post to ground stake mounting of the present invention shown as a pair of tapered washers that are positionable relative to one another into a stack, the washer relative positioning to one another providing a tilt to the vertical of the post insert;

FIG. **4**A shows a top plan sectional view of the top of the pair of tapered washers of FIG. **4** with tabs of which washers, that extend from a narrowest portion of each washer edge, extending oppositely;

FIG. **5** shows a side elevation sectional view like that of FIG. **4** except that the ground anchor is shown tilted from the vertical, which tilt is shown corrected by the alignment of the tapered washers tabs, that provides a tilt to the washer stack, whereby the connected post is aligned to the vertical;

FIG. **5**A shows a top plan sectional view that is like that of FIG. **4**A except that the tapered washer tabs are shown aligned over one another;

FIG. **6** shows a view like that of FIG. **4** except that a ball segment and seat mount like that of FIG. **1** is shown arranged between the ground anchor top and post insert bottom surfaces;

FIG. **7** shows an enlarged profile sectional view taken along the line **7**—**7** of FIG. **6** of the ball and seat segment mounting;

FIG. **7**A shows a view like that of FIG. **7** except the seat is show moved out of center with the ball segment for aligning a connected post to the vertical;

FIG. **8** shows a top plan view of a friction gasket for arrangement between the surfaces of the ball and seat segment of FIG. **7**;

FIG. **9** shows a top plan view of a washer for fitting between the top of the seat segment and the bottom surface of which post insert seat of the adjustable mounting;

FIG. **10** shows a profile perspective view of an upper section of the post of FIG. **1**, the top end thereof shown aligned for receiving a first embodiment of a mail box mount thereon;

FIG. **11** shows a side elevation sectional view of the assembled post top end and mail box mount of FIG. **10**;

FIG. **12** shows a top plan sectional view taken along the line **12**—**12** of FIG. **11**;

FIG. **13** shows a side elevation view of another embodiment of a ground anchor and a side elevation sectional view of a post insert and post section secured thereto by another variation of a ball segment and seat adjustable mounting of the present invention;

FIG. **14** shows a side elevation perspective view of the tubular ground anchor of FIG. **13**;

FIG. **15** shows an exploded view of a ball segment and seat adjustable mounting that is like that of FIG. **14** except that it is shown for use with a concrete mounted base plate;

FIG. **16** shows an exploded view of the ball segment and seat adjustable mounting of FIG. **13**;

FIG. **17** shows an exploded side elevation perspective view of a mail box, a frame mount and cantilevered tube of the present invention;

FIG. **18** shows an end view of the mail box, frame mount and cantilevered tube of FIG. **17** in their connected attitude mounted to a post;

FIG. **19** shows a top plan view of a frame mount like that of FIGS. **17** and **18**, except the frame of this embodiment is adjustable and is arranged for mounting a mail box onto a top end of a wood post by screws turned through mount bars and directly into top of a wood post;

FIG. **20** shows a profile perspective view of an adjustable mail box mount of the present invention;

FIG. **21** shows an enlarged end sectional view of the mail box pivoting cross bar taken within the line **21**—**21** of FIG. **20**;

FIG. **22** shows a perspective view of the adjustable mail box mount of FIG. **20** utilized for mounting a mail box onto a wood beam;

FIG. **23** shows an end elevation view of the adjustable mail box mount of FIG. **20** mounting a mail box onto a wood post end, the pivoting cross bar shown pivoted to the vertical, with screws turned therethrough and into the post sides; and

FIG. **24** shows a top plan view of the adjustable mail box mount of FIG. **20**, with the pivoting cross bars shown pivoted to the horizontal and with screws turned therethrough and into the end of a wood post.

DETAILED DESCRIPTION

The present invention is in a post system that includes a number of novel and unique elements. FIG. **1** shows an exploded profile perspective view of one arrangement of post system **20**, hereinafter referred to as system. In FIGS. **1** and **2**, the system **20** is shown used for mounting a mail or newspaper tube **21**, hereinafter referred to as tube, cantilevered out from the side of a post **22**. Which post **22**, its ground mounting arrangements and fastener components, as set out hereinbelow, are also useful for mounting a mail box as shown in FIGS. **10** through **12**, and **17** through **19**. Though, of course, the system **20** and the other embodiments therein could be utilized as a post alone, for example a fence post, or could be used for mounting any item, within the scope of this disclosure.

As thus shown in FIGS. 1 and 2 and as indicated by the descriptions herein, the post 22 is an outdoor-mountable post configured and adapted for supporting outdoor lateral loads such as loads imposed when the newspaper tube 21, or a section of fencing, or any other structural member, becomes fixedly attached to the post 22 and extends laterally outward and sideways from the post 22.

The system **20** of FIG. **1** includes a ground stake **23**, shown as a section of angle iron **24** that is pointed at a lower end **25**. The upper or top end of which angle iron section includes a cap **26** fixed thereover that is formed as a square tube with walls **27** with a flat plate **28** arranged thereover. The angle iron section **24** top end is telescoped into which square tube, one of which tube walls includes a bar **27**a secured thereacross to present an anchor that binds into the ground wherein the ground stake is driven, inhibiting ground stake movement and withdrawal, as set out below. The flat plate **28** that is arranged across the square tube top end is shown as including a keyhole **28**a, that allows an eye bolt **29** head end **30** to be fitted therethrough. Which head end **30** is holed at **30**a to receive a bolt **31** fitted through a hole **31**a formed in tube wall **27** and secured in the opposite tube wall. The eye bolt **29** is thereby secured to the square tube **26**, a threaded end extending at a right angle upwardly from the flat plate **28**. Shown in FIG. **1**, the eye bolt **29** threaded end **29**a is fitted through an open center portion or hole **33** of a ball segment **32**. Which opening or hole **33** is tapered outwardly from a lesser diameter bottom end to a greater diameter top end, the bolt threaded end **29**a thereby being free to swing across which hole **33** top end. The eye bolt **29** threaded end **29**a is fitted thorough a gasket **34** that preferable has a like surface area to the ball segment **32** surface, as shown also in the top plan view of FIG. **8**.

Shown in FIGS. **1**, **7** and **7**A the eye bolt **29** threaded end **29**a is for fitting through an adjustable mount that consists of ball segment **32** with tapered hole **33** and gasket **34** and a square post mount **35** containing a seat. The square post mount includes a center hole **36** that eye bolt **29** threaded end **29**a is fitted through with a washered nut **37** turned thereover. The washered nut **37** turned on the eye bolt **29** couples the ball section **32** and seat together with gasket **34** therebetween providing a capability for adjusting the attitude to the vertical of a post **40** secured onto which square post mount **35**, as set out hereinbelow. In another mounting embodiment, as shown in FIGS. **4** and **5**, as well as the ball segment and seat mounting embodiment of FIG. **6**, a post insert **39** is utilized for receiving post **39** telescoped thereover.

Shown in FIGS. **1**, **7**, **7**A, **13** and **16**, the post **22** is for telescoping over the square post mount **35**, resting on a lip **38** formed around a lower edge of which mount, the post preferably secured thereon as by gluing, with a snap-in arrangement, or the like, in a manufacturing setting. For attaching the square post mount **35** onto the ball segment **32**, the eye bolt threaded end **29**a is fitted through the center hole **36**, extending into the post **22**. So arranged, an operator, not shown, positions the post **22** to a desired attitude to the vertical and fits the washer nut **37** through a portal **40** formed through the post side and onto the eye bolt threaded end **29**a. He then turns and tightens that washer nut **37** onto the eye bolt threaded end **29**a, compressing a seat **51** formed in the undersurface of which square post mount **35** tightly against the ball segment **32** surface, sandwiching gasket **34** therebetween, and locking the post **22** square post mount end in place with the ball segment **32**. Which gasket **34** is formed of a course material to provide a non-slip surface between which ball segment surface and seat coupling. Thereafter, a window **41** having shoulders **41**a is snapped into to cover over portal **40**, completing mounting.

FIG. **1**A shows an exploded view of another embodiment of an adjustable mounting **150** that, like the embodiment of FIG. **1**, includes a ball section **151** that may have a smooth or grooved outer surface **152**. The ball section is for fitting into a seat **153** that has a hemispherical surface **154** to accommodate the ball section fitting snugly thereagainst and, like the ball section, may be smooth or scored, for promoting a binding between the engaged surfaces when they are clamped together. To further promote which binding, a washer **155**, can be positioned between the ball section and seat surfaces. Such washer **155** is preferably formed of an abrasive material. It may be formed as a complete circle or may be a circle that has had sections removed therefrom, as shown. Like the ball section and seat combination of FIG. **1**, the seat **153** is positionable to ball section **151** to provide for movement therebetween for adjusting the vertical positioning of a post **156**, shown as a hollow square tube, that the seat is mounted to in a lower end thereof.

Shown best in FIG. **1**A, the ball section **151** is preferably a hemisphere whose outer surface **152** is score thereover and includes a center hole **157** that is to receive a threaded end **158**a of a bolt **158** fitted therethrough. The ball section **151**, as shown, is preferably formed of plastic and includes a number of equal spaced curved ribs **159**, that connect to an apex ring **160** that hole **157** is formed through the center of.

The underside of the ribs **159** are for positioning on a top surface of a top plate **162** shown mounted across a top end of a ground stake **161**. The ground stake has a blade **163** as a lower end thereof that, like the angle iron **24** of FIG. **1**, is for driving into the ground, an angle plate **163**a thereof slicing into the ground, securing the ground stake in the ground.

For positioning the ball section **151** onto the top plate **162** a slot **164** is formed on the bias across and through the top surface that is to receive a flattened end **158**b of bolt **158** that has a hole **158**c formed therethrough. With the bolt flattened end **158**b fitted through slot **164**, a pin **165** can be fitted through the bolt hole **158**c, prohibiting bolt withdrawal with the bolt threaded end **158**a extending out from the top of ball section **151**.

To mount the ball section **151** and seat **153** together the bolt threaded end **158**a is arranged to fit through a center hole **166** of seat **153** and through a center hole **168** of a washer plate **167** and to receive a nut **169** turned thereover. Like the ball section **151**, the seat body, as shown, is preferably formed of plastic and includes a number of spaced apart ribs **170** extending radially from a ring **171** wherethrough the hole **166** is formed. The ribs include curved surfaces **170**a for supporting the seat **154** that, like ball section surface **152**, may also be scored, or the like, to increase surface friction. Side walls **172** are provided across the rib **170** ends, and an outstanding ridge **173** is formed around the seat body **153**, below the lower edges of side walls **172**. To couple the seat **153** into the post **156** end, the seat body, with the seat surface **154** facing out of the post end, is urged into the open post end until the seat body ridge **173** slides into a slot **174** that has been formed around the post interior, adjacent to the post end. Shown in FIGS. **1**A–**1**C, for convenience, both post ends are shown as including inner slot **174** formed therein. The seat ridge **173** when urged into the post end tends to flex inwardly, contracting upon itself, and upon entering the post slot **174**, will immediately expand into that slot, locking the seat **174** in and across the post end. Access to the post interior is provided through a port **175** formed in the post side, above slot **174** to allow nut **169** to be turned onto the bolt threaded end **158**a, clamping the ball section **151** and seat **153** together, as shown in FIG. **1**B. Whereafter a cover, like the window **41** of FIG. **1**, can be installed over the port **175**.

To provide for adjusting the position of the seat **153** on the ball section surface **152**, the bolt **158** coupling of pin **165** is intentionally loose to allow for movement of the bolt threaded end **158**a across that coupling, which movement is provided for by the formation of the ball section hole **157** to allow a loose fit of the bolt **158** fitted therethrough. Accordingly, the bolt **158** can be tilted from the vertical, and that tilt will be reflected in the positioning of the seat **155** fitted thereto that is, in turn, translated to post **156**. So arranged, the post can be positioned to the ground stake so as to compensate for an angle that the stake **161** is driven into the ground and for ground conditions, to mount the post **156** at a desired attitude. In practice, the adjustable mount of the invention allows for up to twenty (20) degrees of change in vertical attitude of post **156** to the ground surface whereto the ball section **151** is maintained.

FIG. **1**B shows the assembled adjustable mount **150**, and FIG. **1**C shows the seat **153** directly secured and rigidly mounted by bolt **158** to a top surface of a concrete slab, supporting post **156** mounted thereto. Which arrangement does not allow for adjustment of the angle of the post that is seated on and at approximately a right angle to the concrete surface. In this arrangement the bolt **158** lower end **158**d is anchored in the slab of concrete **180**, the bolt threaded end **158**a extending outwardly therefrom to fit through the center hole **166**. The seat **153**, in turn, is mounted in the open end of post **156**, and passes through hole **168** in washer plate **167**, to receive the nut **169** turned thereover, rigidly mounting the post **156** onto the top surface of cement slab **180**.

The seat 153, as referenced in FIG. 1A and shown also in FIGS. 1B–1C, is thus an insertable member that is "concavo-convex" in shape as shown in those drawings, in accordance with the usual meaning of the term "concavo-convex" which generally refers to an item that is concave on one side and convex on the other.

FIGS. **4** and **5**, show another post **22** mounting embodiment that includes a post insert **39** that is a square open tube that utilizes a tapered washer stack, shown also in FIGS. **4**A and **5**A, as the post **22** mount rather than the ball segment and seat embodiment, as discussed above. The post insert **39**, like the post mount **35**, is to receive the post **22** telescoped thereover, as set out and discussed hereinbelow. Further, it should be understood, other post mounts and tubes and tube configurations, such as round, could be so used within the scope of this disclosure.

Shown best in FIGS. **7** and **7**A, the ball segment seat **51** formed across the undersurface of the square post mount **35** of FIG. **1** is hemispherical in shape to conform to the surface of the ball segment **32**. This seat **51** is also shown with the square post mount **35** of FIG. **6** and in the bottom plan view of FIG. **9**. Further, it should be understood, where the ball segment seat **51** is set out above as formed in the square post mount **35** or across a lower end of the post insert **39**, that seat can also be formed across a lower end of the post **22** itself, within the scope of this disclosure. Which post mounts of FIGS. **6**, **7**, **7**A and **16**, do not include the gasket **34**, but instead employ a roughening at **32**a of the ball segment surface to provide a friction surface therebetween, that is shown best in FIG. **16**. A ball segment and seat coupling is thereby provided that allows the post **22** to be tilted across the ball segment **32** surface, as illustrated best in FIGS. **7** and **7**A, for adjusting the post attitude relative to the top surface **28** of the ground stake **23**.

FIGS. **4**, **5** and **6**, as set out above, utilize a post insert **39** that is adjusted to the vertical for receiving the post **22** end telescoped thereover. To maintain a secure coupling of which post insert **39** and post **40** end, spacers **43** are arranged between opposing surfaces of which post insert and post. Which spacers **43** are preferably each a saddle having a center slot with parallel legs thereacross and are formed from a resilient material. The spacers **43** are fitted, as shown in FIGS. **4**, **5** and **6**, across the post insert top edge **39**a and across a top edge of a slot **45**, or slots **45**, that are formed in the side of which post insert. Two points of spacers **43** contact with the post **22** interior walls are thereby provided for preventing movement of the post **22** relative to the post insert **39**.

As set out above, the embodiments of the invention shown in FIGS. **1**, **6**, **7** and **7**A, as do the adjustable mountings shown in FIGS. **13**, **15**, and **16**, all employ variations of ball segment and seat mountings between the ground stake and post mount or post insert. The ball and seat arrangement of FIG. **1**, and as shown in FIGS. **7** and **7**A, is a ball segment **32** for fitting it in a hemispherical seat **51** of the square post insert **35**. A gasket **34** is shown sandwiched between which ball segment and seat in FIG. **1** and the ball segment surface is shown roughened at **32**a in FIGS. **7** and **7**A, for prohibiting relative movement or slippage of the mount components when they are clamped together.

Functionally, the ball segment and seat arrangements of FIGS. **1**, **6**, **7** and **7**A, are alike, as are the ball and seat arrangements of FIGS. **13**, **15** and **16**. Except that the mountings of FIGS. **1**, **6**, **13** and **15** include gasket **34**, while the mountings of FIGS. **7**, **7**A, and **16**, show as a roughened surface **32**a included on the ball segment **32** surface.

FIGS. **13** and **16**, involve a tubular or cylindrical ground stake **52**, shown best in FIG. **13** as a cylinder **53**, that includes a pointed lower end **54**. The upper or top end of which cylinder includes a cap **55** that is formed as a square tube with walls **56** and with a flat plate **57** arranged thereover. The cylinder **53** top end is telescoped into and secured in which square tube **55**, the flat plate **57** closing off the tube end. Which flat plate **57** has a hole **58** formed therethrough that is counter sunk on the flat plate undersurface to receive a tapered undersurface of a the head **61** of a flat head bolt **60** that is fitted therethrough. Which bolt **60** functions like the described eye bolt **29** except, of course, it relies on a frictional engagement between the countersunk portion of hole **58** and head **61** undersurface to allow a washer nut **37** to be tightened thereover. Otherwise the functioning of which eye bolt **29** and bolt **60** should be taken as being the same.

As shown in FIGS. **13** and **16**, the cylinder **53** is to be driven into the ground, pointed end first, as a ground anchor. For further anchoring which cylinder **53**, each square tube wall **56** includes a tab **59** cut therein, that cut section then bent outwardly to present an edge to engage and bind into the ground wherein the ground stake is driven, inhibiting its withdrawal.

FIG. **15**, shows another post **22** mounting that includes the ball segment **32** secured onto a top surface of a bracket **63** that has a raised center portion and planar sides that are holed for receiving cement fasteners **64** fitted therethrough and driven into a cement, concrete, or like surface, securing the bracket thereto. Which bracket **63** raised center portion is center holed to receive the bolt **60** fitted therethrough prior to mounting. While the bolt head **61** is shown for receiving a screw driver blade, it should be understood that a hex shaped head could be so used as head **61** that would accommodate a wrench head fitted under the bracket **63**, to hold that head while the washer nut **37** is turned onto the bolt **60** threaded end.

As set out above the open center portion or hole **33** through the ball segment **32** is tapered from a lesser diameter at its base to a greater diameter at its top, to allow for tilting of bolt **31**. Which angle of taper, as shown as angle A in FIGS. **7**, **7**A and **13**; as set out hereinabove, allows for a change in angle of the angle of post **22** of up to twenty (20) degrees from a right angle to the ground. Preferably; the hole tapers to provide up to a twenty degrees (20°) change of the post longitudinal axis so as to provide an angle of tilt to the attached post of up to ten degrees (10°) either side of a right angle to the plane of the ground or top surface of a ground stake. This tilting capability allows for positioning the post **22** or post insert **39** back to the vertical so as to compensate for the ground stake the top surface not being horizontal.

FIGS. **4** through **6**, show another embodiment of a ground stake **65** that includes a platform **66** and pointed stake **67**, which stake is shown as having been pounded into the ground. FIG. **5** shows the stake **67** as having displaced from the vertical in that driving, necessitating a tipping of the post insert **39** to compensate to position the post **22** telescoped thereon to the vertical.

Hereinabove have been set out a number of ball segment and seat configurations for attaching a post insert **39** onto the top of a ground stake to allow for a tilt of that post insert to where it is in a vertical attitude. FIGS. **4**, **4**A, **5** and **5**A, show another post insert mounting arrangement that also allows for tilting of the post insert **39**. As shown, this tilting arrangement consists of a pair of tapered washers **70** and **72**, that overlay one another forming a stack. In FIG. **4** the washers **70** and **72** tapered surfaces are shown to slope oppositely, with the top and bottom surfaces of which stack thereby being essentially parallel. To provide for washer positioning each washer includes a tab **71** and **73**, respectively, that extends outwardly from the thinnest washer side. Shown in FIG. **4**A the tab **71** of the washer **70** extends from one side of the stack, with the tab **73** of the washer **72** shown extending outwardly from the other stack side, indicating that the washer tapered surfaces slope oppositely. So arranged, the washer stack would have essentially parallel top and bottom surfaces. FIG. **5**A shows the tapered washers **70** and **72** as having been turned to where the tabs **71** and **73** align, the tapers overlay one another, providing a tilt to the stack top surface relative to the bottom, as shown in FIG. **5**. This tilt, as shown, is to compensate for the positioning of the ground stake pointed stake **67** being at other than the vertical. Functionally, with the tapered washers **70** and **72** positioned to provide a desired angle to the post insert **39**, the washer nut **37** is turned onto the bolt, whereafter the post **22** is installed onto the post insert **39**, as described above.

The post **22** mounted to the post mount **35** or is telescoped over the post insert **39** is then useful for: mounting a newspaper tube **21** cantilevered outwardly from the post top end, as shown in FIGS. **1** and **2**; mounting a mail box mount **75** across a top post end, as shown in FIGS. **10** through **12**, to receive a mail box thereon; mounting mail box across the post **22** top end by a frame mount, as shown in FIGS. **19**, **20**, **23** and **24**; mounting a newspaper tube **21** cantilevered from the post **22** top end that, in turn, mounts a mail box as shown in FIGS. **17** and **18**, or mounting a mail box onto a horizontal wood beam, as shown in FIG. **20**.

The newspaper tube **21**, shown in FIGS. **1** and **2**, is preferably an open tube or hollow, the top and bottom sides of which tube at one end, are formed into outwardly extending top and bottom end tabs **80** and **81**, respectively. The end tabs **80** and **81** are each for fitting in one of parallel lateral slots **82** formed across a post **22** side, and each end tab **80** and **81** has at least one, and preferably two holes **83** formed therethrough. To install the newspaper tube **21** cantilevered from the post **22** pegs **85** are passed through the post **22** top end and are individually fitted through the end tabs **80** and **81** holes **83**. This operation is preferably performed manually and accordingly the pegs **85** are preferably formed from a molded material, such as a plastic, and are configured for ease of installation. FIGS. **1**, **2** and **3**C show a first peg **85** embodiment that includes a broad head **86** and tapered body **87**. A locking ridge **88** is shown extending outwardly from the peg body **87**, opposite to broad head **86**. Which locking ridge **88**, with peg insertion into an end tab hole **83**, as shown best in FIG. **3**C, extends into the post lateral slot **82**, for preventing peg withdrawal.

A second peg **90** embodiment is shown in FIGS. **3**A and **3**B. The peg **90**, like the described peg **85**, has a broad head **91** and includes a tapered body **92**. Rather than a locking ridge, however, the peg **90** includes spaced teeth, serrations, barbs, or threads **93** that are formed along and to extend outwardly from the tapered body **92**, below the broad head **90**. Shown best in FIG. **3**B, with the peg **90** installed in hole **83**, a side of one or more of the teeth, serrations, barbs, or threads **93** will engage the tab hole **83** edge, prohibiting peg withdrawal.

A cap **95**, shown in FIGS. **1** and **2**, is preferably installed onto, to cover, the post **22** open top end. Prior to which cap **95** installation the pegs, as described, are fitted through that post open end and into the tab holes **83**. Which cap **95**, shown in FIGS. **10** through **12**, is replaced by mail box mount **75**, or a mail box mounted thereon. Which mail box mount **75** consists of a flat top plate **76** that has downwardly extending right angle flanges **77** that project from along opposite edges. Equidistantly spaced plates **78** are secured across which downturned flanges **77**, the flanges and plates thereby forming a square center recess that is for receiving a square post **22** end fitted therein. For providing overlying coupling surfaces where the flanges intersect the post surfaces, opposite side end sections of which post **22** may be removed leaving tabs **79**. Shown best in FIGS. **11** and **12**, the tabs **79** and plates **78** are to be fitted together in juxtaposition arrangement with holes **79**a through each aligned to receive pins **79**b fitted therein securing the mail box mount **75** onto the post **22** end. So arranged, the flat top plate **76** is for receiving a mail box secured thereon.

FIGS. **17** and **18** show another mounting **100** for a mail box **110**. The mounting **100** includes a pair of brackets **101** that are each connected to the ends of a pair of parallel bars **102**. The bars **102** space the brackets **101** apart in parallel relationship forming a rectangular frame. To construct this frame, each bracket **101** includes as a pair of flanges **104** that extend outwardly and parallel from along the top and bottom edges, respectively, of a bracket web. The bar **102** ends are for fitting between which flanges **104**, each receiving a coupling device, that is preferably a pivot, and is fitted through the bracket flanges and a bar end. The bars **102** have holes **105** formed through the mid-portions thereof for receiving fasteners **106**, as set out below. Which mounting **100** is either for mounting onto the top surface of the newspaper tube **21** that is cantilevered from a top end portion of post **22**, as shown in FIGS. **17** and **18** or onto a post **22** end, as shown in FIG. **19**.

To provide for mounting mail box **110**, as shown in FIGS. **17** and **18**, the bracket **101** webs, proximate to their ends, include longitudinal slots **103** that receive fasteners, shown as bolts **107**, fitted therethrough and through corner holes formed in a cover **111** of mail box **110**. Prior to which mail box **110** mounting fasteners **106**, shown as bolts, are fitted through center openings **105** formed through the bars that are, in turn, fitted through holes formed through the newspaper tube **21** top, with nuts **106**a, shown in FIG. **18**, turned over the bolt ends. Wood screws can be used in place of bolts **106** and nuts **106**a, within the scope of this disclosure. With the frame mounted to the newspaper tube **21**, the mail box **110** is seated, as set out above, and the bolts **107** are fitted through the mail box cover corner holes and through the bracket web slots **103** to receive washers **109** and nuts **108** turned onto which bolt **107** ends, as shown best in FIG. **18**.

FIG. **19** shows another framed arrangement for mounting a mail box onto a post **22** end, which post **22** is shown as formed of wood, through it could be formed of solid plastic, or could be tubular with a top end insert, or a like arrangement, within the scope of this disclosure. The frame arrangement of FIG. **19**, like that of FIG. **17**, includes a pair of brackets **101**, each with parallel flanges **104** extending from the edges thereof, and with a pair of bars **102** for positioning between which brackets. One of which bars **102**, like the arrangement of FIG. **17**, is connected at its ends between the flanges **104** by fasteners **104**a, with the other bar **102** ends mounted to slide freely in longitudinal slots **104**b formed in the flanges **104**. With the mounting **100** fitted onto a post top end, shown in FIG. **19** as a wood post, and the bar

102 whose ends are mounted in longitudinal slots **104**b moved to where the bar holes **102**a in both bars **102** aligned with the wood post top surface, screws **113**, or the like, are turned through holes **102**a and into the post top, securing the mounting **100** thereto. Thereafter the mail box **110** is installed to the mounting as described hereinabove with respect to FIGS. **17** and **18**.

FIG. **20** shows another embodiment of a mounting **120** for mail box **110**. The mounting **120**, like the mounting **100**, includes a pair of brackets **121** with bars **122** arranged therebetween. The brackets **121** each include parallel flanges **123** extending from opposite edges of a mid-section of a web **124**, and include cross braces **125** secured therebetween, providing a rigid bracket structure. Shown best in FIGS. **20** and **21**, the bar **122** ends are each necked down into sleeve **126** that is drilled longitudinally and threaded to receive a bolt **127** turned therein. Each bolt **127**, as shown best in FIGS. **21** and **23**, is fitted though a hole **128** formed through the bracket **121** and turned into the bar sleeve **126** end, forming a pivot coupling of which bar to the bracket. The bar **122** pivot coupling allows end bar to be pivoted to the attitudes shown, respectively: in FIGS. **20** and **22**, where wide mid-portions **129** of each bar **122** extend oppositely; in FIGS. **21** and **23** where the mid-portions **129** are parallel and point downwardly; and FIG. **24**, where in mid-portions **129** point towards one another. Which bar **122** positioning is maintained by turning the bolt **127** fitted through flange hole **128** tightly into the bar sleeve **126**. With the bar **122** appropriately positioned fasteners, such as screws **130** can be turned through holes **131** formed in the bar mid-portions and into a wood beam, like that shown in FIG. **22**, or into a top end of a wood post, like that shown in FIGS. **23** and **24**, securing the mounting **120** onto which beam or post end. Thereafter, a mail box **110** can be mounted onto which mounting **120** utilizing the bolts, nuts, and washers **107**, **108**, and **109**, respectively, shown in FIG. **17**, secured through elongate slots **132**, formed in the bracket **121** ends, as shown in FIG. **22**. Where the mounting **120** is shown utilized for attaching a mail box **110** onto a wood beam or wood post, it should be understood that, like mounting **100** it can be used also for mounting a mail box onto a cantilevered plastic tube or post end, or like beam or post arrangement, within the scope of this disclosure.

Herein have been shown and described preferred arrangements of a post system and component elements and mountings thereof of the present invention. It should, however, be understood that the present disclosure is made by way of example only and that changes can be made thereto without departing from the subject matter coming within the scope of the following claims, and a reasonable equivalency thereof, which claims I regard as my invention.

I claim:

1. An adjustable mounting for a post system comprising, a ball segment and seat therefore, where said ball segment includes a body that is formed to have a hemispherical outer surface, has a center hole formed therethrough, and includes a means for mounting a bottom surface of said ball segment body onto a rigid surface; a bolt, as said means for mounting, that has a threaded top end and a means for mounting a lower end of said bolt to a rigid surface, which said means for mounting said bolt lower end provides a loose coupling to allow said bolt to pivot across said bolt lower end mounting; said seat includes a body wherein is formed a concave recess having a surface that is complementary to said ball segment surface, and includes a center hole, which said ball segment body and said seat center holes are counter sunk from a top surface of said seat through said ball segment body forming

an inverted cone shaped opening with a flattened apex, to provide up to a twenty degree (20°) change in angle from a longitudinal center axis of said inverted cone shaped opening to accommodate said bolt threaded end fitted therethrough and through a washer means and is to receive a nut means turned thereover for clamping said ball segment and seat together; and means for mounting said seat body in a straight post.

2. An adjustable mounting for a post system as recited in claim **1**, further including a means for increasing friction between the ball segment hemispherical surface and the seat concave surface.

3. An adjustable mounting for a post system as recited in claim **2**, wherein the means for increasing friction is a gasket formed of a flexible slip resistant material.

4. An adjustable mounting for a post system as recited in claim **2**, wherein the means for increasing friction is a scoring or grooving of the ball segment hemispherical surface.

5. An adjustable mounting for a post system as recited in claim **1**, further including a straight post mount that is open longitudinally to receive a lower end of the straight post that is fitted thereover, and said straight post mount is arranged to receive the seat body secured across a bottom end thereof.

6. An adjustable mounting for a post system as recited in claim **1**, wherein the means for coupling a post end is a post insert means that is a base wherein is formed the seat body and is secured across a bottom end of said post and means for securing said seat body across said post bottom end.

7. An adjustable mounting for a post system as recited in claim **1**, wherein, as the means for mounting the bolt lower end to a rigid surface, the bolt end that is opposite to the bolt threaded end is flattened and includes a hole formed therethrough that is to receive a pin means fitted therein after said bolt flattened end has passed through a slot formed in a plate that is a top of a rigid surface to allow said bolt to pivot across said pin means mount.

8. An adjustable mounting for a post system as recited in claim **1**, wherein, as the means for mounting the bolt lower end to a rigid surface, the bolt end that is opposite to the bolt threaded end is formed into a circle as an eyelet end to receive a pin means fitted therein after said eyelet end has passed through a plate that is a top of a rigid surface.

9. An adjustable mounting for a post system as recited in claim **1**, wherein the straight post is hollow and the seat body for fitting across a lower end of said straight post includes a ridge that extends outwardly from around said seat body outer surface to fit snugly into a groove that has been formed around the inside of said post that is adjacent to said lower end of said post, as the means for mounting said seat body to said post.

10. An adjustable mounting for a post system as recited in claim **1**, wherein the ball segment and seat are formed of a plastic material.

11. An adjustable mounting for a post system as recited in claim **1**, wherein the side wall of the inverted cone shaped opening is at a ten degree (10°) angle from the longitudinal center axis of said inverted cone shaped opening.

12. A support mounting system comprising:

a support member having a hollow lower end and an opening in said lower end, wherein said lower end comprises end sidewalls terminating in a perimeter end face surrounding the opening;

a mounting insert configured for attachment to the support member within the lower end, said mounting insert including a concave side which faces the opening in the lower end of the support member; and

securing means for intercoupling the mounting insert to a rigid support surface such that the perimeter end face of the support member is held thereby against said rigid support surface.

13. The support mounting system as defined in claim 12, wherein the mounting insert comprises a concavo-convex member.

14. The support mounting system as defined in claim 12, wherein the support member comprises a hollow square tube.

15. The support mounting system as defined in claim 12, wherein the support member and the mounting insert are made from a durable plastic material.

16. The support mounting system as defined in claim 12, wherein the mounting insert includes a center hole formed therein and a second side opposite the concave side, the system further comprising a washer plate having a center hole, said washer plate being configured for placement upon the second side of the mounting insert such that the center hole of said plate is disposed in alignment with the center hole of the mounting insert, wherein the securing means extends through the holes and against the plate.

17. The support mounting system as defined in claim 16, wherein the securing means comprises a bolt for securing to the support surface and extending through the center holes of the mounting insert and washer plate, and a nut member engaged with the bolt so as to reside against the washer plate.

18. The support mounting system as defined in claim 12, wherein the mounting insert comprises a hemispherical concavo-concave member.

19. The support mounting system as defined in claim 12, wherein the support member is hollow and includes main sidewalls having a port formed therein to permit access to the securing means, the system further comprising a plate removably secured to the support member so as to cover the port.

20. The support mounting system as defined in claim 12, wherein the end sidewalls include an interior surface having at least one interior slot formed therein, and wherein the mounting insert includes at least one ridge configured for snap-in lockable engagement within said at least one slot.

21. The support mounting system as defined in claim 12, wherein the mounting insert includes a plurality of radially-extending spaced apart ribs.

22. A support mounting system comprising:

a hollow tubular support member having a hollow lower end and an opening in said lower end, wherein said lower end comprises end sidewalls terminating in a perimeter end face surrounding the opening, wherein the support member is made from a durable plastic material;

a mounting insert comprising a concavo-convex member configured for attachment to the support member within the lower end, said mounting insert including a concave side facing the opening in the lower end of the support member, wherein the mounting insert is made from a durable plastic material and includes a center hole; and

a bolt configured for immovable attachment to a rigid support surface such that said bolt extends outwardly from said support surface, into the open end of the support member and through the center hole of the mounting insert; and

a nut member engageable with the bolt for securing the mounting insert with respect to the rigid support surface such that the perimeter end face of the support member is held thereby against said rigid support surface.

23. The support mounting system as defined in claim 22, wherein the support member comprises main sidewalls having a port formed therein to permit access to the nut member, the system further comprising a plate removably secured to the support member so as to cover the port.

24. The support mounting system as defined in claim 22, wherein the end sidewalls include an interior surface having at least one interior slot formed therein, and wherein the mounting insert includes at least one ridge configured for lockable engagement within said at least one slot.

25. The support mounting system as defined in claim 22, wherein the mounting insert includes a plurality of radially-extending spaced apart ribs.

26. A support mounting system comprising:

a support member having a hollow lower end and an opening in said lower end, wherein said lower end comprises end sidewalls terminating in a perimeter end face surrounding the opening;

a mounting insert configured for attachment to the support member within the lower end; and

securing means for intercoupling the mounting insert to a rigid support surface such that the perimeter end face of the support member is held thereby against said rigid support surface.

27. The support mounting system as defined in claim 26, wherein the support member comprises an interior surface defining an interior width and having at least one inner slot formed therein, and wherein the mounting insert is wider than said interior width and includes at least one edge configured for snap-in lockable engagement into said at least one slot.

28. The support mounting system as defined in claim 27:

wherein the mounting insert includes a concave side which faces the opening in the lower end of the support member;

wherein the support member comprises a substantially square cross section; and

wherein the support member comprises a flexible, resilient plastic material adapted to flex radially outwardly responsive to insertion of the wider mounting insert thereinto.

29. The support mounting system as defined in claim 27, wherein the interior surface of the support member comprises an interior circumference, and wherein the inner slot comprises a slot formed along the interior circumference of the support member.

30. The support mounting system as defined in claim 27, wherein the support member comprises a flexible, resilient plastic material adapted to flex radially outwardly responsive to insertion of the wider mounting insert thereinto.

31. The support mounting system as defined in claim 26, wherein the support member comprises a substantially rectangular cross section.

32. The support mounting system as defined in claim 31, wherein the support member comprises a substantially square cross section.

33. The support mounting system as defined in claim 26, wherein the mounting insert comprises at least one ridge that defines a perimeter of said mounting insert.

34. The support mounting system as defined in claim 12, wherein the support member comprises an outdoor-mountable post configured and adapted for supporting outdoor lateral loads imposed when a structural member becomes fixedly attached to said post and extends outward and sideways from said post.

35. The support mounting system as defined in claim 22, wherein the support member comprises an outdoor-mountable post configured and adapted for supporting outdoor lateral loads imposed when a structural member becomes fixedly attached to said post and extends outward and sideways from said post.

36. The support mounting system as defined in claim 26, wherein the support member comprises an outdoor-mountable post configured and adapted for supporting outdoor lateral loads imposed when a structural member becomes fixedly attached to said post and extends outward and sideways from said post.

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