

[54] **ADJUSTABLE MOUNTING APPARATUS
FOR COLUMN SHORING BRACKET**

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[51] Int. Cl. **A47f 5/10, A47h 33/10, E04g 17/16**

[58] Field of Search **248/287, 295, 296, 248/298, 221; 249/219 R, 210, 211, 18, 19, 20, 21, 22, 23, 24, 25**

[56] **References Cited**

UNITED STATES PATENTS

1,490,461	4/1924	Galinghouse	249/210 X
2,386,525	10/1945	White	249/18 UX
3,504,879	4/1970	Strickland	249/219 R X

FOREIGN PATENTS OR APPLICATIONS

550,078	12/1942	Great Britain	249/210
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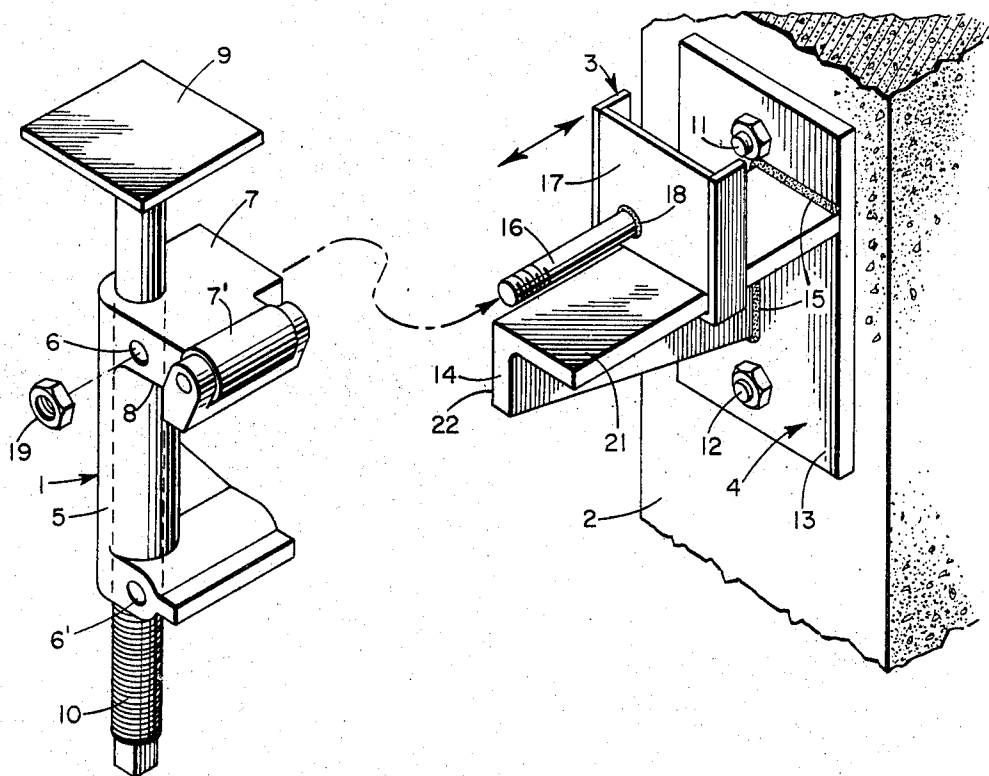
Primary Examiner—J. Franklin Foss

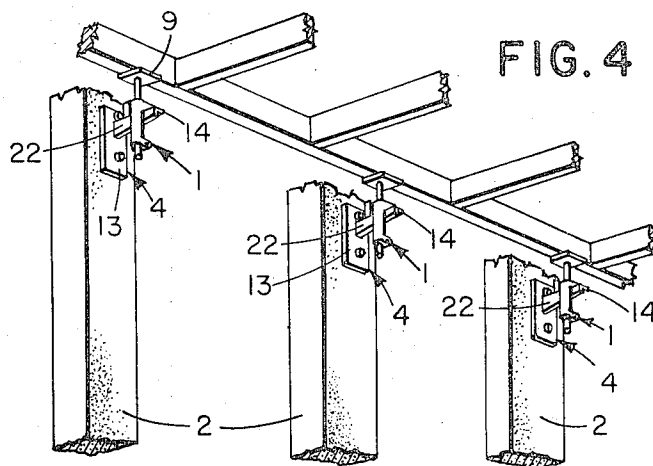
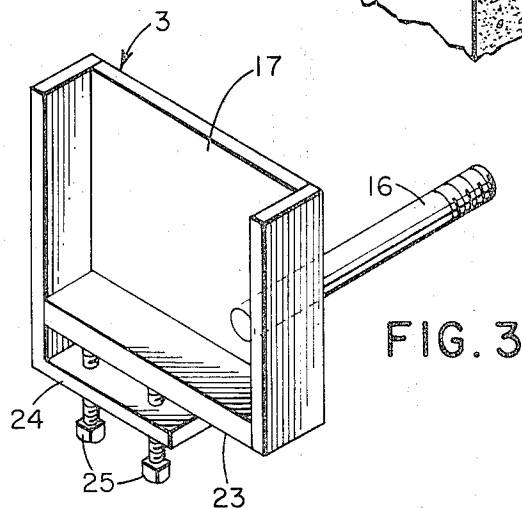
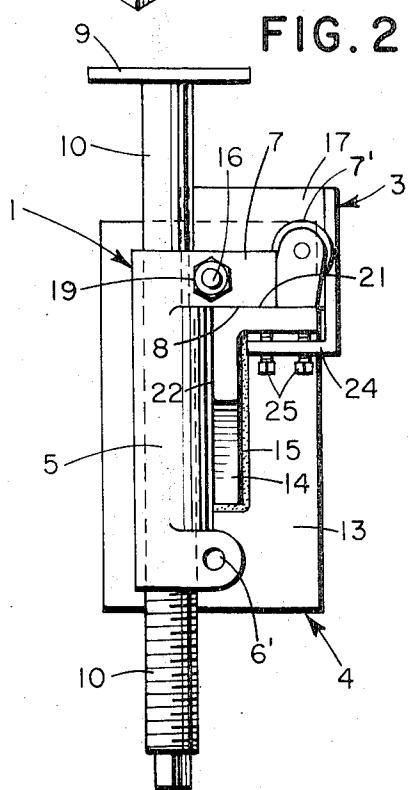
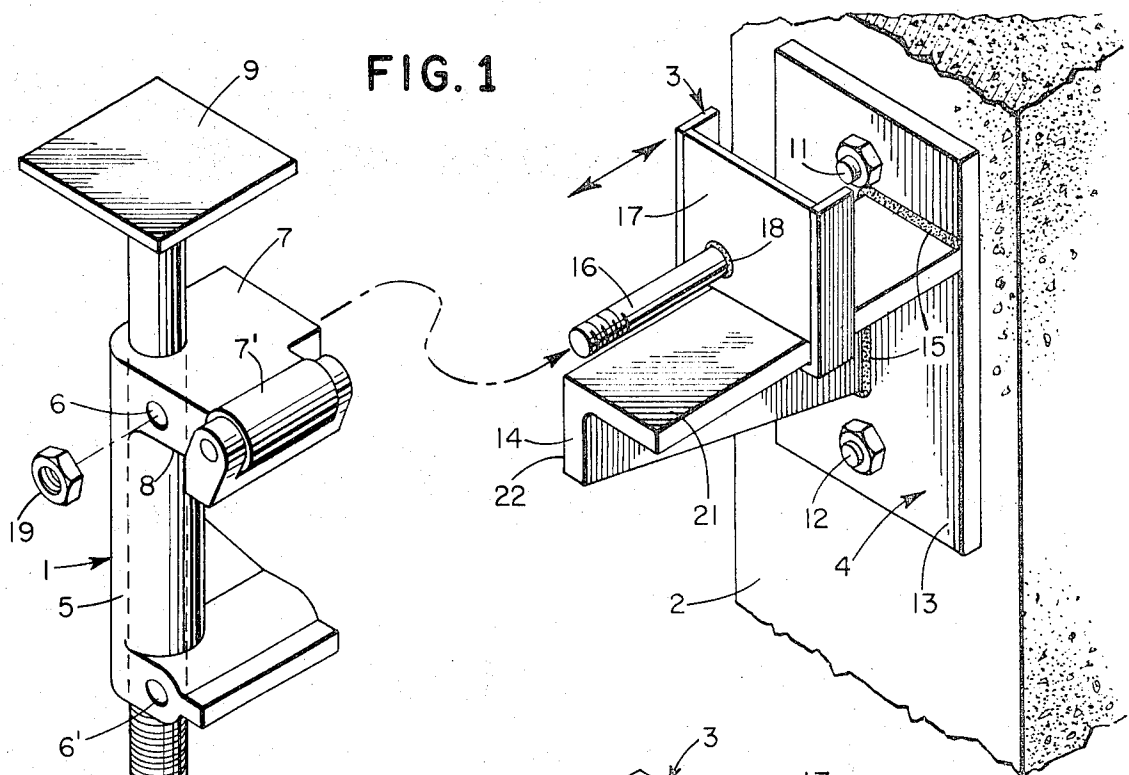
Attorney—William E. Schuyler, Jr. et al.

[57] **ABSTRACT**

Adjustable apparatus for attaching a concrete formwork shoring bracket to a supporting column including a support and an adjustable mounting bracket. The support has a base attachable to the supporting column and has an arm extending outwardly from the base said arm having a horizontal upper surface adapted to supportively engage a lower surface of a laterally extending projection of a formwork shoring bracket. The adjustable mounting bracket is clampable at predetermined positions along the outwardly extending arm of the support and has means for affixing the shoring bracket thereupon so that the combination of the adjustable mounting bracket and the formwork shoring bracket may be positioned at predetermined distances outwardly from the column.

7 Claims, 4 Drawing Figures





ADJUSTABLE MOUNTING APPARATUS FOR COLUMN SHORING BRACKET

BACKGROUND OF THE INVENTION

This invention relates to apparatus for attaching a concrete formwork shoring bracket to a supporting column.

The prior art discloses several means for supporting concrete formwork during the construction of multi-story concrete buildings. Such means for supporting formwork, as used in pouring succeeding higher floors in concrete buildings, has generally taken the form of fixed or movable scaffolding supported from the floor below and upon which the formwork for the next floor is placed. This scaffolding on occasion has been provided with wheels or rollers such that, after completion of the floor for which the formwork has been used, the formwork may be moved laterally to the outside of the building and then raised to be placed in position for the next higher floor.

Another means for supporting such concrete formwork is the column shore bracket disclosed in U.S. Pat. No. 3,504,879 to Strickland. With the bracket of this patent the formwork no longer need be supported by scaffolding which rests upon the floor below and thus restricts working space. Instead, the brackets as disclosed in this patent may be attached to each of a row of supporting columns previously emplaced within the building, the attachment being effected by fastening the brackets onto studs cast into or attached to the columns. The shoring brackets attached to these columns then engage the concrete formwork to be used in constructing the floor above. Each column shoring bracket is vertically adjustable to permit vertical alignment of the formwork. Additionally, the supporting head of the shoring bracket may be lowered such that the concrete formwork may rest upon a roller carried by the bracket and thus may be rolled out of position. While this column shoring bracket provides substantial advantages by freeing the floor area beneath the concrete formwork from the clutter of scaffolding, it has suffered from the disadvantage that its only adjustment has been in the vertical direction with no readily available lateral adjustment for positioning the shoring bracket preselected distances outwardly from the column of which it is mounted. This lack of lateral adjustment outwardly from the column is a substantial disadvantage when there is misalignment of the columns forming a row upon which column shoring brackets are mounted. To provide the necessary precise lateral alignment of a row of shoring brackets it has been necessary to use shims between the shoring brackets and the column to which it is mounted. Thus the achievement of the required precise alignment has necessitated a tedious process of trial and error and has necessitated the availability of substantial number of shims of varying thicknesses. Additionally, where the misalignment of the columns has been greater than the length of the attaching studs, no practical form of mounting these brackets has been available.

SUMMARY OF THE INVENTION

This invention provides an adjustable attaching apparatus for attaching a concrete formwork shoring bracket to a supporting column. The attaching apparatus of this invention is readily adjustable and permits

positioning of the concrete formwork shoring bracket predetermined distances outwardly of the supporting column.

Briefly, the invention contemplates an adjustable attaching apparatus for attaching to a supporting column a concrete formwork shoring bracket, such as shown in Strickland U.S. Pat. No. 3,504,879, which shoring bracket has a laterally extending projection. The attaching apparatus includes a support which is attached to the supporting columns and an adjustable mounting bracket which is releasably attached to the support. The support has a base which is attachable to the supporting column and has an arm extending outwardly from the base, the arm having a horizontal upper surface adapted to supportively engage a lower surface of the laterally extending projection of the shoring bracket. The adjustable mounting bracket is releasably clampable at predetermined positions along the outwardly extending arm of the support and has affixing means for affixing the shoring bracket thereto, such that the shoring bracket as well as the adjustable mounting bracket may be positioned at predetermined distances outwardly from the supporting column.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention having been generally described, a specific embodiment will be discussed in detail with reference to the accompanying drawings in which;

FIG. 1 is a perspective view of the adjustable attaching apparatus of this invention, including a column shoring bracket.

FIG. 2 is an end view of the adjustable mounting apparatus of this invention, the view being taken from the outer end with a column shoring bracket mounted on the attaching means.

FIG. 3 is a perspective view of the adjustable mounting bracket of this invention showing details of the portion of the mounting bracket which faces the supporting column.

FIG. 4 is a fragmentary view of an installation using the apparatus of this invention, wherein concrete formwork is supported by column shoring brackets attached to three substantially aligned columns by means of the adjustable attaching apparatus of this invention.

DESCRIPTION OF AN ILLUSTRATIVE EMBODIMENT

As shown in FIGS. 1, 2 and 4, a concrete formwork shoring bracket 1 may be attached to a supporting column 2 by affixing the shoring bracket 1 to an adjustable mounting bracket 3 which is carried by a support 4 and which, in turn, is attached to the column 2. The shoring bracket 1 includes an elongated body 5 having a pair of holes 6 and 6' for receiving means for affixing the shoring bracket 1 to a supporting column 2 or to other apparatus for attaching to such a column, and an arm or projection 7 extending laterally from the elongated body 5. The laterally extending projection 7 has a flat lower surface 8 which will be substantially horizontal when the shoring bracket 1 is installed. The shoring bracket 1 also has a support head 9 for supportably engaging the concrete formwork and which is vertically adjustable by means of a screw jack 10 engaging screw threads within the body 5. Additionally, the laterally extending projection 7 includes a roller 7' which defines the upper fixed supporting surface of the shoring bracket 1.

In a structure where it is intended to use column-mounted shoring brackets of this type, the structural supporting columns 2 are provided with studs 11 and 12 for attaching such shoring brackets 1 to the columns. These column attaching studs 11 and 12 are threaded and are cast into concrete columns or affixed to other types of columns, the studs being positioned to engage the holes 6 and 6' in the shoring brackets or similar holes in other apparatus adapted to attach the shoring brackets to the columns.

In order to provide lateral adjustment for the precise alignment of individual brackets comprising a row of formwork supports, the shoring brackets 1 are attached, not directly to the studs 11 and 12, but to a laterally adjustable mounting bracket 3 which is carried by a support 4 attached to the column 2. The mounting bracket 3 may be positioned at any point outwardly of the column 2 along the arm 14 of the support 4, thus positioning the shoring bracket 1 at a corresponding preselected position outwardly of the column.

The support 4 includes a base plate 13, which may be attached to the column 2, and an arm 14 attached to the base plate 13. Preferably this base 13 will have a hole pattern corresponding in size and location to the holes 6 and 6' of the shoring bracket 1, so that the base 13 may be attached to the column 2 by the same studs 11 and 12 which might otherwise be used to attach the shoring bracket 1 directly to the column. The arm 14 has an inverted L-shaped cross section, extends downwardly from the base 13 and is attached to the base by conventional means, such as weldments 15.

The adjustably positionable mounting bracket 3 shown in FIG. 3, includes means for affixing the shoring bracket 1 thereto, preferably in the form of an extended mounting arm or threaded stud 16 attached to the upright portion 17 of the mounting bracket by weldments 18 or other conventional means. This stud is sized and positioned to facilitate slidable insertion through the upper hole 6 of the shoring bracket and is such a length that, upon such insertion, a nut 19 or other suitable fastener may be tightened onto the stud to hold the shoring bracket 1 firmly on the stud 16 and against the upright portion 17 of the mounting bracket. The position of the stud with respect to the arm 14 of the support 4 is such that, when a shoring bracket is affixed to the stud, as shown in FIG. 2, the flat lower surface 8 of the laterally extending projection 7 of the shoring bracket 1 rests upon a flat upper surface of the horizontal portion 21 of the arm 14, thus deriving its vertical support from that arm 14 instead of from the stud 16. Additionally, the relative positions of the stud 16 and the arm 14 are such that, when a shoring bracket is so affixed, the body 5 of the shoring bracket 1 may rest against the vertical side portion 22 of the arm 14, thus providing lateral support for the shoring bracket against horizontal movement in a direction toward the support arm 14. It may also be noted from FIG. 2 that upright portion 17 of the mounting bracket is of sufficient height to extend above the level of the top of roller 7' of the shoring bracket 1. Thus, at any time that vertically adjustable support head 9 of the shoring bracket 1 is lowered to a position adjacent the upper surface of laterally extending projection 7, formwork which is supported by the shoring bracket (in such case, resting on roller 7') may be laterally restrained by such upright portion 17 of the mounting bracket.

The adjustable mounting bracket 3 is held onto the support arm 14 by clamping means which clamp the lower surface 23 of the upright portion 17 against the upper horizontal surface of the arm 14. The clamping means may consist of a member 24 either attached to or integral to the upright portion 17 and extending around and beneath the horizontal portion 21 of the arm 14, and one or more threaded fasteners 25 threadedly inserted through the member 24 and adapted to be tightened against the lower surface of the horizontal portion 21 of arm 14. Due to the supportive relationship between the surfaces 21 and 22 of the arm 14 and the shoring bracket, as described above, the mounting bracket 3 need provide only positioning of the shoring bracket 1 outwardly of the column 2 and support against forces on the shoring bracket 1 in directions away from the arm 14. The member 24 extending around and beneath the horizontal portion of the arm 14 provides such support to the bracket 3.

The relative positions of the hole pattern in the base 13 of the support 4, the arm 14, the adjustable mounting bracket 3 and the mounting arm 16 on the mounting bracket are preferably such that, in use, the mounting arm 16 is axially aligned with the upper attaching means 11 on the column 2. In this manner the position of the column mounted shoring bracket 1, when attached to a column by the mounting apparatus of this invention, will be outward of the column but will be aligned vertically and transversely of the column with the position that would be occupied by a similar shoring bracket if mounted directly onto the attaching means 11 and 12.

Alternatively, the base 13 of the mounting apparatus may be provided with additional mounting holes to engage additional attaching means affixed to the supporting columns to obtain greater support for the shoring bracket. The shoring bracket used with this invention is normally constructed with only two holes for attaching the shoring bracket to a supporting column. Thus, only with additional column mounting apparatus, such as this invention, can additional support for the shoring bracket be obtained by providing additional attaching means on the supporting column.

In practice, the mounting apparatus of this invention may be used in the construction of any concrete structure where it is necessary to support overhead formwork and where there are rows of vertical supporting columns available for attaching formwork shoring brackets thereto, especially shoring brackets of the type disclosed in Strickland U.S. Pat. No. 3,504,879. Where the columns of a row are in precise alignment with one another, the shoring brackets may, if desired, be attached directly to the columns without the use of the mounting apparatus of this invention. However, where lateral adjustment of the shoring brackets outwardly of the column is desired, and especially where such adjustment is necessary to correct for slight misalignment of the columns comprising the row so that all shoring brackets of the row may support the proper members of the formwork, the use of this adjustable mounting apparatus is highly desirable. The procedure for such use may be as follows. Firstly, a support 4 is attached to each column which is intended to support the formwork, by means of the fasteners 11 and 12 affixed to the column. Secondly, a mounting bracket 3 is clamped at any desired position to the arm 14 of each support 4. Thirdly, a formwork shoring bracket 1 is in-

serted onto the extended threaded mounting arm 16 of each mounting bracket 4 and is secured thereon by a fastener 19, the mounting arm 16 being inserted through the upper mounting hole 6 of the shoring bracket. Fourthly, the clamping means 25 of the mounting brackets 3 are released as necessary and the shoring bracket/mounting bracket combinations on the columns of the row are mutually aligned. Lastly, the clamping means 25 of the mounting brackets 3 are again secured against their respective support arms 14, thus rendering the row of formwork shoring brackets ready for use.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents falling within the scope of the invention are included.

What is claimed is:

1. An adjustable attaching apparatus for attaching a concrete formwork shoring bracket to a supporting column, said shoring bracket having an elongated body oriented in a generally vertical direction and a laterally extending projection defining an upper supporting surface, said attaching apparatus comprising in combination
 - a support comprising a base and an arm extending outwardly from said base, said base being attachable to the supporting column and said arm having a horizontal upper surface adapted to supportably engage a lower surface of the laterally extending projection of the shoring bracket, and
 - an adjustable mounting bracket having clamping means releasably attaching said adjustable mounting bracket at predetermined positions along said outwardly extending arm of said support, and having a shoring bracket affixing means whereby said concrete formwork shoring bracket may be affixed to said adjustable mounting bracket and thence to said support and may be positioned at predetermined distances outwardly from said column, said shoring bracket affixing means being positioned to facilitate said supportable engagement of said lower surface of said shoring bracket laterally extending projection by said support arm upper surface.
2. The adjustable attaching apparatus of claim 1 wherein said outwardly extending support arm has a vertical side portion adapted to supportably engage a portion of the vertical body of said shoring bracket.
3. The adjustable attaching apparatus of claim 1 wherein said shoring bracket affixing means comprises an extended mounting arm spaced from and substantially parallel to said horizontal upper surface of said support arm.
4. The adjustable attaching apparatus of claim 3 wherein said shoring bracket has a plurality of mounting holes and said extended shoring bracket mounting arm is slidably insertable into one of said mounting holes of said shoring bracket.
5. The adjustable attaching apparatus of claim 1

wherein said adjustable mounting bracket extends upwardly from said support arm to a point above the level of the upper fixed supporting surface of an affixed shoring bracket.

6. Apparatus for supporting concrete formwork used in the construction of multi-story concrete buildings, said apparatus comprising in combination
 - a formwork shoring bracket having an elongated body and a laterally extending projection and being adapted for attachment to a vertical column in such a building, and
 - attaching means for attaching said shoring bracket to said column, said attaching means comprising
 - a support comprising a base attachable to said supporting column and an arm extending outwardly from said base, a side portion and an upper portion of said arm being adapted to supportably engage, respectively, a portion of said elongated body of said shoring bracket and a lower surface of said laterally extending projection of said shoring bracket whereby substantially all of the load from the formwork upon said shoring bracket is supported by the engagement of said portions of said shoring bracket and said arm, and
 - an adjustable mounting bracket having clamping means for releasably attaching said mounting bracket
 - at predetermined positions along said outwardly extending arm of said support, and having means for affixing said shoring bracket to said adjustable mounting bracket, whereby said shoring bracket may thus be attached to said column and positioned at predetermined distances outwardly of said column.
7. A support system for attaching concrete formwork, used in the construction of multi-story buildings, to a row of at least three generally aligned columns, said system comprising for each of said columns
 - a support comprising a base and an arm extending outwardly from said base, said base being attachable to said supporting column, and said arm having a horizontal upper surface adapted to supportably engage a lower surface of a laterally extending projection of a shoring bracket, and
 - an adjustable mounting bracket having clamping means releasably attaching said adjustable mounting bracket at predetermined positions along said outwardly extending arm of said support, and having a shoring bracket affixing means positioned to facilitate said supportable engagement of said lower surface of said shoring bracket laterally extending projection by said support arm upper surface, whereby said concrete formwork shoring bracket may be affixed to said adjustable mounting bracket and thence to said support, each shoring bracket thus being positionable at predetermined distances outwardly from said column on which it is mounted such that said three or more shoring brackets may be positioned in precise lateral alignment with one another despite slight misalignment of said three or more columns.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,776,499 Dated December 4, 1973

Inventor(s) John S. Turner and William A. Fremer

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 29 change "downwardly" to --outwardly--;

Column 6, line 48 change "sais" to --said--.

Signed and sealed this 16th day of April 1974.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents