

March 13, 1928.

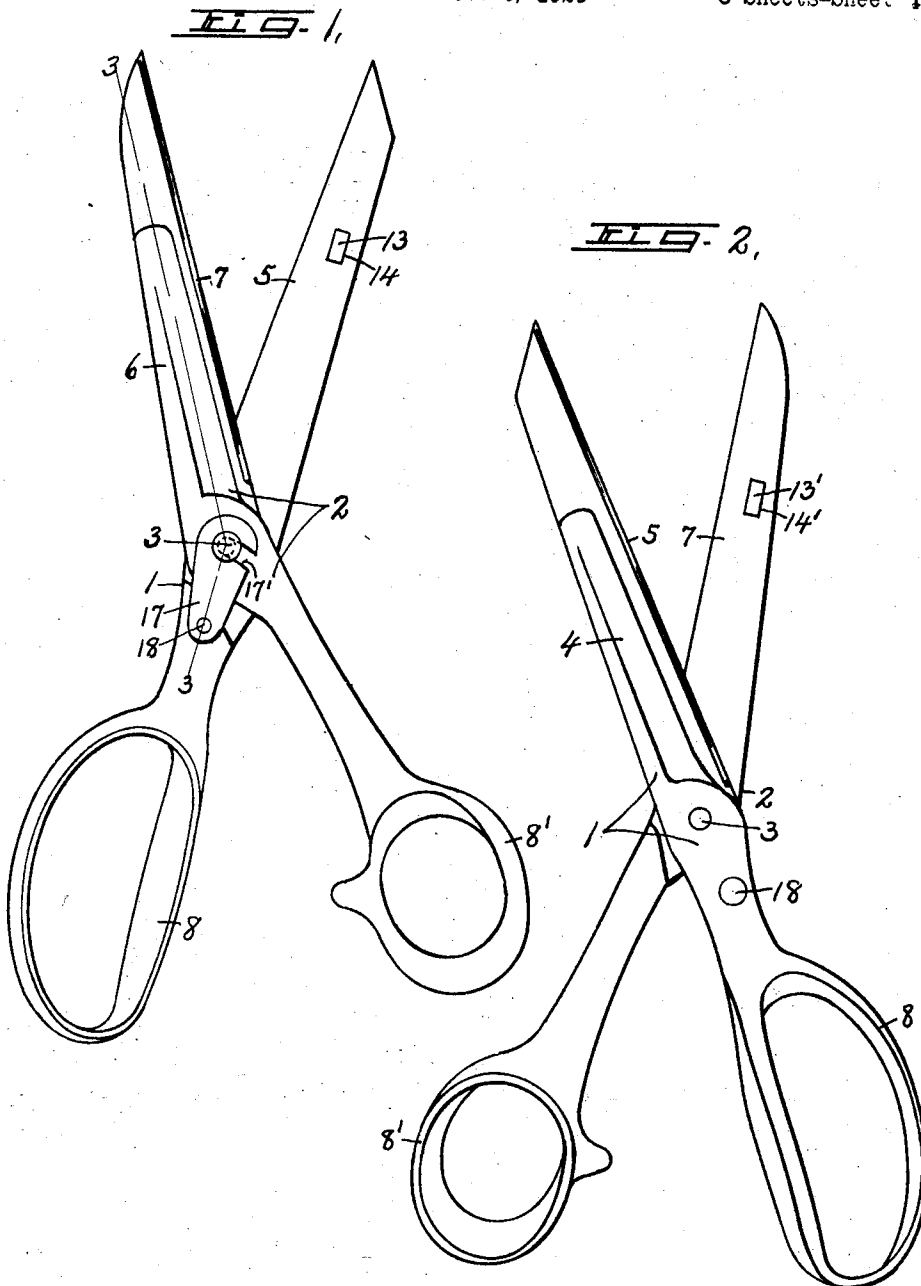
C. H. WILKES ET AL

1,662,772

SHEARS

Filed Nov. 8, 1926

3 Sheets-Sheet 1



WITNESS  
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FIG. 3.

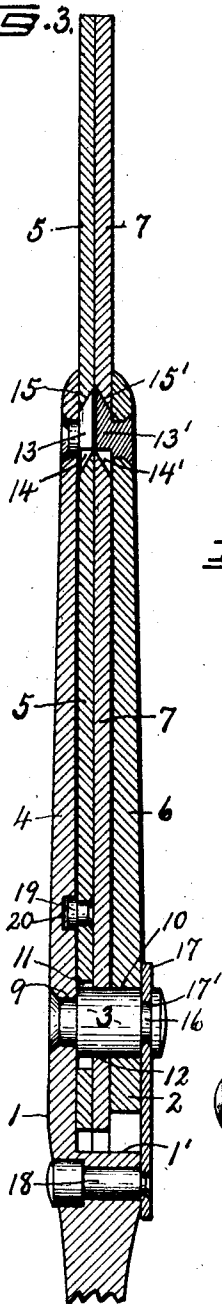


FIG. 4.

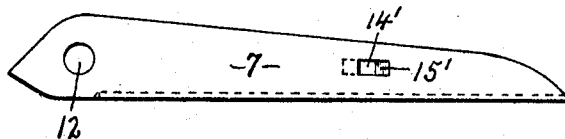


FIG. 5.

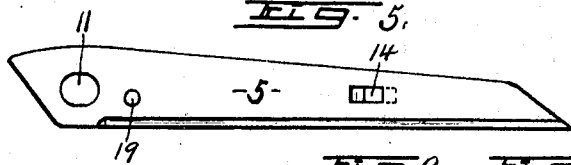
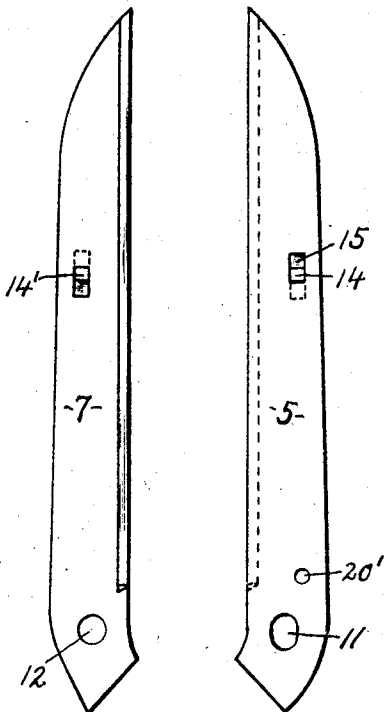
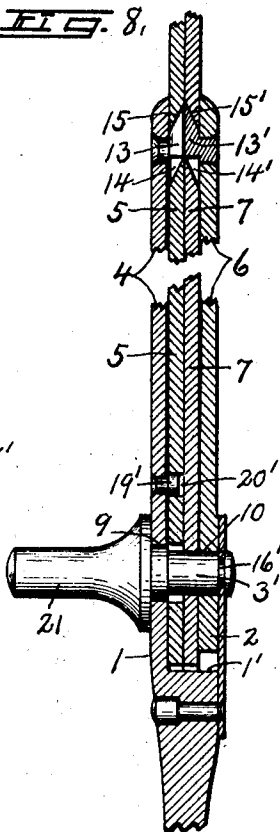


FIG. 9. FIG. 10.

FIG. 8.



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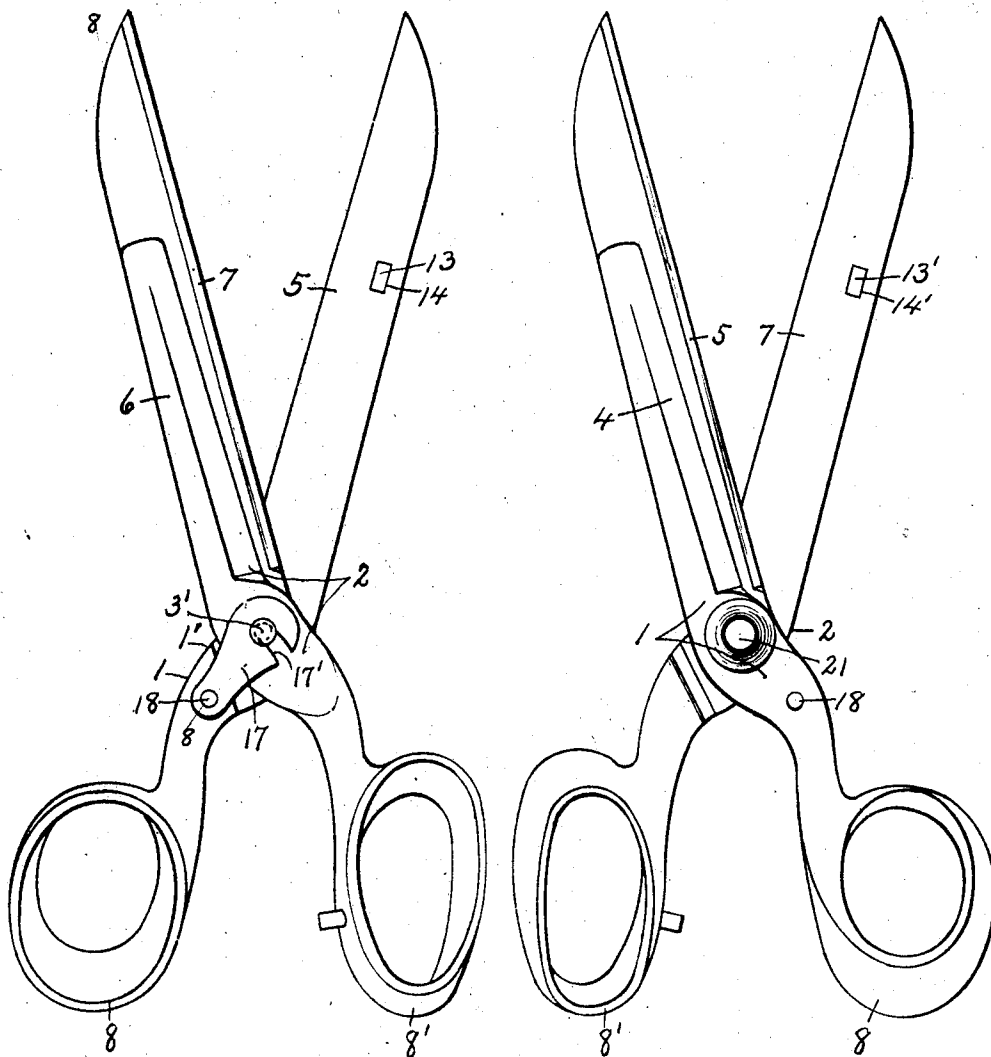
SHEARS

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FIG. 6,

FIG. 7,



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## UNITED STATES PATENT OFFICE.

CLARENCE H. WILKES AND GEORGE E. CALHOUN, OF AMSTERDAM, NEW YORK, ASSIGNORS TO A-KEE-NA PRODUCTS COMPANY, INCORPORATED, OF AMSTERDAM, NEW YORK, A CORPORATION OF DELAWARE.

## SHEARS.

Application filed November 8, 1926. Serial No. 147,082.

This invention relates to shears of the class set forth in our pending application Serial No. 32,911, filed May 26, 1925, in which the shearing blades are detachably mounted upon the adjacent faces of a pair of pivotally connected levers or blade supporting sections so that they may be quickly removed for sharpening purposes and replaced by new or sharpened blades when desired without renewing or replacing any of the other parts.

One of the greatest advantages in the use of removable blades in shears of this character is that the blades may be made from plate or sheet steel of uniform thickness and, therefore, capable of being tempered to the required degree of toughness and hardness more uniformly and economically than would be possible with the cutting edges formed directly upon the crossing levers as commonly practised.

It is highly important in all classes of shears and particularly those with removable blades to maintain close contact of the shearing edges throughout their entire working lengths or from their extreme rear ends to the extreme front ends or points.

The main object of the present invention is to not only meet these requirements but also to enable the blades to be easily and quickly removed and replaced by new ones at less than the cost usually incurred in sharpening the old type of blades.

Another object is to assure a firm retention of the blades in operative position against relative movement upon the respective levers when the latter with the blades thereon are assembled for use.

Other objects and uses relating to specific parts of the shears will be brought out in the following description.

In the drawings:—

Figures 1 and 2 are opposite face views of a pair of shears embodying the various features of our invention.

Figure 3 is an enlarged longitudinal sectional view taken on line 3—3, Figure 1, the handles being broken away.

Figures 4 and 5 are face views of the separate detached shearing blades shown in Figures 1, 2 and 3.

Figures 6 and 7 are opposite face views of a heavier service shears showing certain modifications in the form of the levers and

in the construction of the pivotal post and of other detail parts.

Figure 8 is an enlarged longitudinal sectional view, partly broken away, taken on line 8—8, Figure 6.

Figures 9 and 10 are face views of the detached cooperative shearing blades.

The shears shown in Figures 1 to 5 inclusive comprises a pair of levers —1— and —2— crossing each other intermediate their ends and pivotally connected to each other by a pivotal stud —3— for relative shearing movement about the axis of the pivot.

The forwardly extending arm of the lever —1— constitutes, what may be termed, a blade-supporting section —4— having its inner face substantially flat transversely and slightly concaved longitudinally for receiving and supporting a separate shearing blade section —5—, the other end of said lever being provided with a handle or finger loop —8— of any suitable form to facilitate the manipulation of the levers.

The forwardly projecting arm of the lever —2— constitutes what may be termed a blade-supporting section —6— having its face substantially flat transversely and slightly concaved longitudinally for receiving and supporting a separate shearing blade section —7— for shearing co-action with the blade section —5—, the other end of said lever —2— being formed with a handle or finger loop —8— in opposite relation to the handle —8— to facilitate the manipulation of the levers about the axis of the pivotal stud —3—.

The stud —3— is riveted or otherwise firmly secured at one end in an aperture —9— in the lever —1— and has its other end extended axially beyond the inner face of said lever through an aperture —10— in the lever —2— to form a journal bearing for the last-named lever which has its inner transversely flattened face extended rearwardly some distance beyond the stud —3—.

The shearing blade sections —5— and —7— are substantially the same length and extend along the inner faces of their respective arms —4— and —6— from points some distance to the rear of the stud —3— to points a considerable distance beyond the front ends of the arms —4— and —6— and are respectively provided with apertures —11— and —12— registering with the cor-

responding apertures —9— and —10— for receiving the pivotal stud —3—.

The transversely flattened inner face of the arm —4— of the lever —1— extends rearwardly some distance beyond the pivotal stud —3— where it joins the shank of the handle —8— and at this junction the shank is thickened transversely to extend beyond the inner transversely flattened face of the arm —4— a distance corresponding approximately to the combined thicknesses of the adjacent portions of the arm —8— and shearing blades —5— and —7— as shown in Figure 3 thereby forming a stop shoulder —1'— for limiting the opening movement while at the same time permitting shearing co-action of the cutting edges of the blades —5— and —7— throughout their lengths.

As previously stated, the shearing blades —5— and —7— are detachably mounted upon the inner faces of their respective supporting arms —4— and —6— of the levers —1— and —2— and are preferably of greater length than said arms so that when adjusted for use they will extend a considerable distance beyond the front ends thereof as shown in Figure 3 thereby conserving the amount of stock required for the levers —1— and —2— and at the same time assuring greater shearing efficiency of the blades throughout their entire lengths from heel to point.

The portion of the stud —3— passing through the registering apertures in the parts —5—, —6— and —7— is cylindrical and of substantially the same diameter as the openings —10— and —12— in the parts —6— and —7— so as to hold those parts against radial and endwise movement relatively to each other and to the lever —1— when the parts are adjusted for use while at the same time permitting free turning movement of the arms —4— and —6— and blades —5— and —7— carried thereby about the axis of the stud.

Similar devices are provided for holding each of the blades —5— and —7— against turning movement relatively to its supporting arm —4— about the axis of the pivotal stud —3— and for this purpose each of the arms —4— and —6— is provided near its front end with lugs —13— and —13'— riveted or otherwise secured in suitable apertures therein so as to become permanent parts thereof as shown in Figure 3.

These lugs —13— and —13'— project inwardly from the inner faces of their respective arms —4— and —6— and are adapted to enter elongated slots —14— and —14'— in the corresponding shearing blades —5— and —7—.

The front end walls of the slots —14— and —14'— are beveled or inclined inwardly and forwardly from their outer faces to

form wedge-shaped locking shoulders —15— and —15'— adapted to be engaged by the front ends of the lugs —13— and —13'— respectively to assist in holding the blades —5— and —7— upon their respective arms —4— and —6—.

The portions of the lugs —13— and —13'—, projecting inwardly from their inner faces of their respective arms —4— and —6—, are of just sufficient transverse width to enter their respective slots —14— and —14'— without lateral play so that when seated in said slots the adjacent portions of the blades —5— and —7— will be held against lateral movement relatively to their corresponding arms —4— and —6—.

The front ends or toes of the lugs —13— and —13'— are also beveled inwardly and forwardly from the inner faces of their respective arms —4— and —6— at angles corresponding to the angles of the shoulders —15— and —15'— so as to wedge against said shoulders as the corresponding blades —5— and —7— are placed over and upon the lugs and then drawn rearwardly until stopped by the inclined front ends of the lugs.

The transverse depth of the portions of the lugs projecting beyond the inner faces of their respective arms —4— and —6— is substantially equal to the thickness of their respective blades —5— and —7— so that when the blades are assembled upon their corresponding supporting arms in engagement with the adjacent lugs, the inner faces of the lugs will be substantially flush or slightly within the corresponding inner faces of the blades so as to avoid a possibility of contact of the cutting edges of either blade with the lug of the other blade as the shears are opened and closed.

The rear ends of the slots —14— and —14'— are also beveled inwardly and forwardly from the outer faces of the blades —5— and —7— substantially parallel with their corresponding shoulders —15— and —15'— so as to facilitate the assembling of the blades upon their respective lugs in a manner hereinafter described.

The length of the inwardly projecting portions of the lugs —13— and —13'— is approximately equal to the length of the slots which receive them but for convenience of assembling, the rear ends or heels of the lugs are disposed at substantially right angles to their inner faces as shown in Figure 3 thus permitting the rear ends of the blades to be tilted about the toes of the respective lugs as fulcrums in the act of placing the blades upon or removing them from their respective arms —4— and —6—.

Owing to this necessity for tilting movement of the blade —5— relatively to its supporting arm —4— the aperture —11— is elongated lengthwise of the blade sufficiently

to allow the rear end of the blade to pass over and upon the pivotal stud —3— which, it will be remembered, is rigidly secured to the arm —4—.

5 It will be noted however that the blade —7— is placed upon its supporting arm —6— in engagement with the corresponding lug —13— before the lever —2— is placed upon the lever —1— and, therefore, 10 there is no necessity for elongating the opening —12— in the blade —7— because it, together with its lever —2— may be moved rectilinearly or axially over and upon the stud —3— and held in operative relation to 15 its companion blade —5— and its support —4— by means presently described.

As a further means for facilitating the assembly of the levers —1— and —2— one upon the other with their respective blades in 20 operative position thereon, the stud —3— is extended beyond the outer face of the adjacent portion of the lever —2— and is provided with an annular groove —16— adapted to be engaged by a latch lever —17— 25 which, in turn, is journaled upon the thickened portion of the shank of the lever —1— by means of a pivotal pin —18— just at the rear of the shoulder —1— as shown in Figure 3.

30 This latch lever —17— rests against the adjacent outer face of the levers —1— and —2— and is provided with a slot —17'— open at one side to permit the passage of the reduced portion of the pivotal stud —3— 35 therinto, the closed side of the slot serving as a stop for limiting the locking movement of the latch.

Suitable means is also provided for holding the blade —5— against accidental end- 40 wise movement due to the elongation of the slot —11— when adjusted for use and for this purpose a relatively short stud —19— is riveted or otherwise secured in an aperture in the blade —5— just in front of the slot —11— and is adapted to seat in a cor- 45 responding socket —20— in the inner face of the supporting arm —4—, the diameters of the socket —20— and portion of the stud —19— entering the same being substantially 50 equal so as to assist in holding the blade —5— against endwise movement as well as against lateral movement relatively to the arm —4—.

55 It is to be understood however that the transverse width of the slot —11— is substantially equal to the diameter of the adjacent portion of the pivotal stud —3— for the purpose of holding the rear end of the blade —5— against lateral movement.

60 The shears shown in Figures 6 to 10 inclusive are quite similar to that shown in Figures 1 to 5 inclusive except as to form or design and with the further exception that the pivotal stud as —3'— is provided 65 with a post —21— extending axially some

distance beyond the outer face of the lever —1— to afford a rest adapted to engage the surface of a table or other support upon which the shears might be laid to hold the shears at a convenient angle for the en- 70 gagement of the handles by the hand of the user.

A further exception is that the stud as —19'— instead of being secured to the ad- 75 jacent blade is riveted or otherwise secured to the corresponding arm —4— of the lever —1— and has its inner end projecting slightly beyond the inner face of said arm for entrance into an aperture —21'— in the blade —5— to assist in holding the blade 80 and arm against relative endwise or lateral movement when the parts are assembled for use.

Otherwise the same description applied to the construction shown in Figures 1 to 5 in- 85 clusive also applies to the construction shown in Figures 6 to 10 inclusive.

#### Operation.

In assembling the parts of the shears the 90 blade —5— is first placed flatwise against the inner face of the front end of the arm —4— with its slot —14— registered with the lug and its rear end tilted away from the adjacent portion of the arm —4— suffi- 95 ciently to enable the beveled shoulder —15— to engage the beveled front end or toe of the lug —13— whereupon the blade —5— is drawn rearwardly upon the lug —13— in the manner of drawing a shoe on to the foot 100 thereby causing the beveled shoulder —15— to wedge against the beveled toe of the lug —13— and drawing the adjacent portion of the blade tightly against the inner face of the arm —4— during which operation the 105 slot —11— in the rear end of the blade —5— is registered with the free end of the pivotal stud —3— and the rear end of the blade is then forced against the inner face of the arm —4— causing the stud —19— to enter 110 the socket —20—.

The blade —7— is then placed upon and against the inner face of its supporting arm —6— in such manner as to cause the lug —13'— to enter the slot —14'— whereupon 115 the rearward movement of the blade —7— along and upon the inner face of the arm —6— will cause the beveled shoulder —15'— to wedge against the beveled toe of the lug —13'— thereby drawing the blade —7— 120 tightly against the inner face of the supporting arm —6—.

The aperture —12— in the blade —7— is then registered with the opening —10— in the arm —6—, and the lever —2— with the 125 blade —7— thereon is then placed over and upon the pivotal stud —3— until the inner face of the blade —7— contacts with the inner face of its companion blade —5— where- 130 upon the latch lever —17— is forced by hand

into interlocking engagement with the grooved end of the stud —3— for holding the blade-supporting arms and their corresponding levers and blades in operative position.

The latch lever —17— is preferably made of rather stiff spring metal with its free end tensioned inwardly or axially of the stud —3— so that when adjusted to its locking position it will exert pressure upon the outer face of the lever —2— with sufficient force to hold the cutting edges of the shearing blades in shearing contact throughout their lengths or from heel to point.

When it is desired to remove the blades the large lever —17— is simply rocked from its locking position out of engagement with the adjacent face of the lever —2— whereupon the lever —2— and blades —5— and —6— may be easily withdrawn one from the other axially of the stud —3— or, when the latch lever is unlocked in the manner described, the inversion of the lever —1— with the free end of the stud —3— at the bottom will allow the lever —2— and blades —5— and —6— to fall out of engagement with each other and with the lever —1— by their own weight ready for replacement of new blades if desired or in case the old blades become worn.

It will be seen from the foregoing description that a shears constructed in the manner described is a distinct advance in this art in that the blade-supporting levers may be made from untempered and, therefore, lower priced material while the blades may also be

made of relatively low-priced tempered sheet or plate steel and, when dulled or otherwise impaired, may be replaced by sharp blades without material loss of time and at no more cost than would be occasioned by the sharpening of the blades of ordinary shears.

Furthermore, the manner of mounting the blades upon their respective levers assures a close contact of the cutting edges thereof throughout their lengths without adjustment due partially to the spring tension exerted by the latch lever —17— tending to hold the blades in contact.

What we claim is:—

In a shears, a pair of levers crossing each other, separate shearing blades detachably applied to the inner faces of the front arms of the levers to overlap at the crossing, a pivotal stud secured to one lever and projecting through registering apertures in the other lever and blades, the blade attached to the stud-carrying lever having an elongated aperture to allow limited lengthwise movement thereof relatively to its supporting lever, means for locking said blade and preventing such lengthwise movement, and a latch on the stud-carrying lever movable into and out of engagement with the other lever for holding the latter against axial displacement from the pivotal stud.

In witness whereof we have hereunto set our hands this twenty-seventh day of October, 1926.

CLARENCE H. WILKES.  
GEORGE E. CALHOUN.