

July 14, 1931.

H. ROSENBERG

1,814,965

ART OF ANCHORAGE

Filed Dec. 16, 1925

FIG. 1.

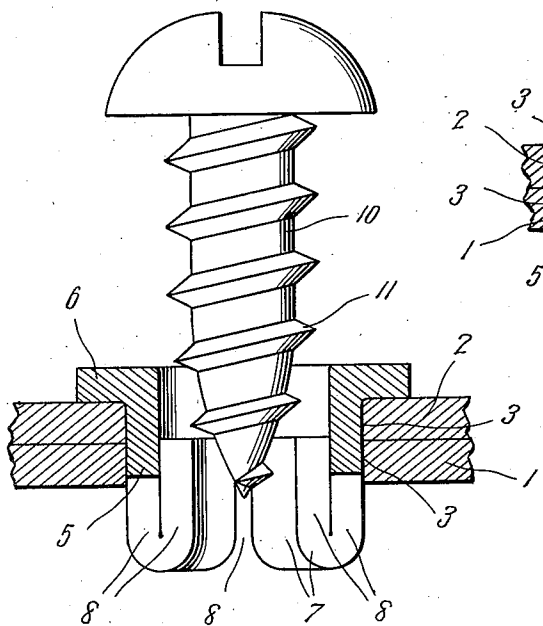


FIG. 2.

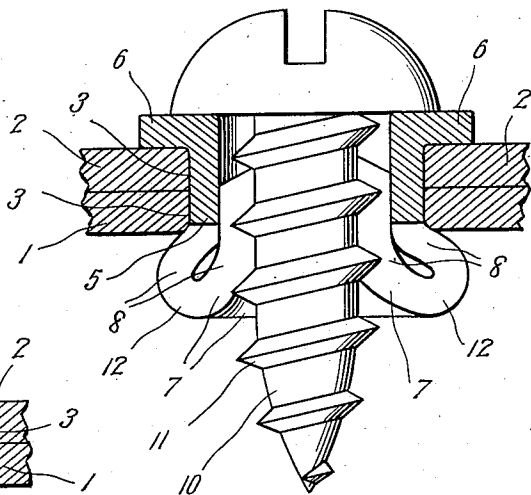


FIG. 3.

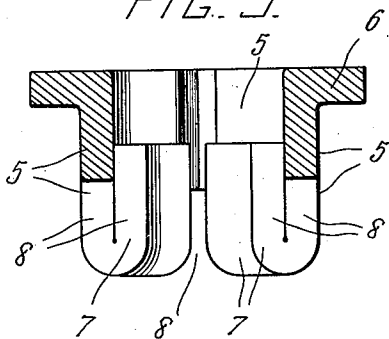


FIG. 4.

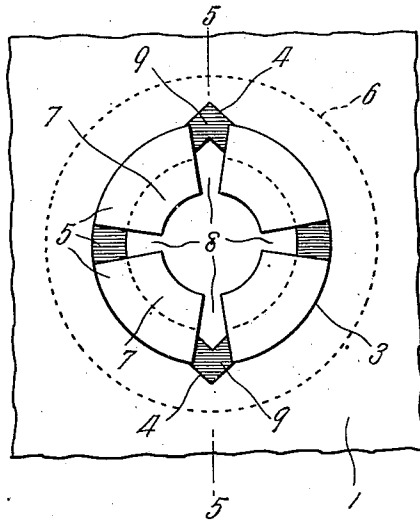
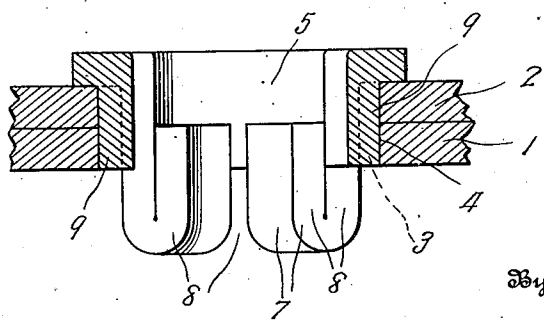


FIG. 5.



Inventor:

HEYMAN ROSENBERG

By *Edgar M. Kitchin*
his Attorney

UNITED STATES PATENT OFFICE

HEYMAN ROSENBERG, OF NEW YORK, N. Y.

ART OF ANCHORAGE

Application filed December 16, 1925. Serial No. 75,830.

This invention relates to improvements in anchorage devices and the art of connecting parts together, and has for its primary object the connection of parts in a manner to effectively withstand separating or loosening stresses.

The invention is especially adapted for use in the connecting of parts liable to be subjected to unusual stresses and wear, such as are incident to hinged connections in automobile body structures and like devices, and to this end attains the further object of resisting twisting or torsional stresses.

With these and further objects in view as will in part hereinafter become apparent and in part be stated, the invention comprises certain novel steps in the art of anchorage and certain novel constructions, combinations and arrangements of parts as subsequently specified and claimed.

In the accompanying drawings,—

Figure 1 is a view partly in elevation and partly in vertical, central section through work and anchorage devices embodying the structural features and well adapted for carrying out the novel steps of the art comprehending the present invention, the wedging means being shown in the first position of assemblage.

Figure 2 is a similar view of the same with the wedging means in its final position and the other parts correspondingly positioned, that is, in the condition upon the completion of the steps of the process.

Figure 3 is a view similar to Figure 1 of the sleeve rivet detached.

Figure 4 is an inverted plan view of the parts seen in Figure 1 with the wedging means omitted.

Figure 5 is a transverse, vertical section taken on the plane indicated by line 5—5 of Figure 4, that is, on a plane at right angles to the plane of the section of Figure 1.

Referring to the drawings by numerals, 1 and 2 indicate sheets or plates of work, such, for example, as the metallic wall of an automobile body and the leaf of a door hinge of such body. Other parts, of course, may be connected than this particular type of work, and, in some instances, it may become desir-

able to provide anchorage to a single sheet of work, as, for example, when a snap fastener is to be connected to the side of an automobile body for receiving the cooperating parts of such fastener carried by the automobile top or curtain. The work, whether of a single sheet or a plurality of sheets 1 and 2, is first provided with an appropriate aperture 3, or registering apertures 3 when the work is made up of more than one plate. The aperture 3 is shaped to receive the anchorage device hereinafter described, and, to that end, is preferably provided with lateral notches 4, 4, at appropriate points about the otherwise circular opening 3.

The anchorage means for the work consists in part of a sleeve rivet or eyelet having a tubular body portion 5 preferably flanged at one end, as at 6, and at the other end formed with a return fold 7. The fold 7 is tubular or sleeve-like also, and extends reversely into the bore of the body 5 lapping portions of the body and preferably lying with the exterior, curved surface of the return fold contacting with the interior, curved surface of the body 5. To facilitate certain actions of the parts, as will hereinafter be stated, a part of the body 5 and the return fold 7 are preferably slit or slotted at 8, 8. As many such slits may be utilized as found desirable, but for practical purposes four have been found ample, and, in fact, a less number even down to a single slit has proven capable of successful utilization, and, in some structures, the slits or slots 8 are omitted altogether. Since the body 5 is preferably a cylindrical sleeve, the said body is preferably formed at appropriate places with laterally-extending ribs 9, 9, proportioned and located to be snugly received by the recesses 4 of the work. Obviously, any number of the ribs 9, from a single rib upward, may be utilized, and, in fact, the same functional result may be secured by forming the sleeve body 5 otherwise than cylindrical and correspondingly forming the openings in the work.

Cooperating with the sleeve rivet and forming an essential part of the anchorage apparatus is a wedge acting somewhat on the

principle of the functioning of a wimble without, however, any drilling action. To this end, the wedge preferably consists of a screw 10 of the form of the ordinary, commercial wood screw of the gimlet type, except that the thread 11 of the screw is hardened sufficiently for entering or severing metal, such as soft iron or soft steel, substantially without injury to the thread, after the manner of the functioning of the thread of the screw set forth in my prior Patent No. 1,465,148, dated August 14th, 1923. The thread 11 is preferably not interrupted, as shown in the said patent, but, of course, may be so interrupted in instances where such interruption may become desirable. The screw 10 is produced preferably by the ordinary method of manufacture of wood screws and afterward case-hardened, as by the cyaniding process, or any other acceptable process, as a means for effecting the required hardening of the thread 11. Furthermore, it is to be observed that the body of the screw 10 is tapered substantially to a point, and that the thread 11 follows the body practically to the point from which fact the screw gets its classification as of the gimlet type. I preferably utilize a screw 10 for any particular sleeve rivet 5 having a body of substantially the same diameter as the bore or opening within the return fold 7 of the rivet.

In carrying out the preferred steps of the art in the anchorage or work, or of an anchorage device to work, the structures thus described and shown in the drawings are utilized, and a statement of the operation of the assembling of such structures will serve to distinctly set forth the steps of the art or process. The work being prepared, whether of a single sheet as sheet 1, or two sheets as sheets 1 and 2, a sleeve rivet is introduced through the aperture formed in the work after the manner indicated in Figures 1 and 5. The screw 10 is then introduced into the sleeve rivet with the entering or pointed end extending down into the return fold 7. The screw 10 is then revolved in the usual manner of threading a screw home in a piece of wood or other work, and this revolving action may be accomplished either by appropriate machinery, or by a screw-driver held in the hand of an operator and inserted in the usual kerf of the head of the screw 10. As the screw 10 begins to revolve, the tip of the lower end portion of the thread 11 begins to enter the material of the return fold 7, and effects a folding of the metal making up such return fold. The thread thus entering the material of the return fold 7 not only severs the metal which it engages and causes a resulting flow thereof in opposite directions, but also, with the revolution of the screw 10, draws the screw longitudinally in a direction through the sleeve rivet. As this action continues with the resulting entry of helices of the thread 11

of constantly increasing diameter, the material of the return fold 7 caused to flow by the entering thread first fills the valleys between successive helices of the thread and then reacts to crowd outer portions of the return fold 7 outward in ever increasing impingement or frictional contact with the inner surface of the walls of the body 5 of the sleeve rivet. This continues until the head of the screw 10 strikes the upper face of the flange 6. Since the screw cannot enter further, the action changes to a wedging action drawing or forcing the return fold 7, or those portions thereof engaged by the thread 11, toward the head of the screw 10. This drawing action produces a buckling, that is wrinkling, of the return fold 7 and the surrounding portions of the body 5 and produces a laterally outstanding, annular bead or looped portion 12 continuously encircling the wedging member except for the interruptions incident to the slits or slots 8, and consequently forming a rivet head at the inner or usually inaccessible surface of the work and lapping such surface.

The sleeve rivet is preferably formed of soft sheet steel or like sheet metal, and the hardened condition of the thread 11 of screw 10 causes the thread to effect such an anchorage in the material entered as to produce permanent anchorage of the wedging member within the sleeve rivet capable of withstanding the incessant vibration and other stresses incident to use of automobile structures. However, in special cases where extraordinary precaution is desired, the wedging member may be provided with shoulders for its thread after the manner taught in my above-identified patent, which shoulders would, on any tendency toward return or release rotation of the screw, strike against face portions produced by the slits or slots 8 and lock the screw against return motion. Such precaution, however, is not usually required or necessary because of the substantial permanence of the connection effected both by the non-injured condition of the thread 11 and the tremendous compression stresses effected by rotation of the screw 10 after its head has engaged the flange 6.

It should be apparent that the flange 6 is largely utilized as a means of convenience of assemblage, and its size may substantially be reduced or the flange may be entirely eliminated while leaving the structure capable of functioning, because, with the flange omitted the head of the screw 10 would strike the outer end of the body 5 at about the time that it would also strike the outer face of the plate 2 of the work and the action of the thread 11 drawing the sleeve rivet 5 outward would insure effective anchorage even in the absence of the flange 6. The flange, however, is desirable for purposes of initial assem-

blage and as a further stiffening and retaining element.

The adaptability of the invention for use on structures having inaccessible interiors should be obvious from the foregoing. Sheets of metal arranged to afford no access to their inner surfaces can be connected effectively and easily, all of the work of effecting the anchorage being performed at or outside of the outer or exposed surface.

This application is one of a series of three filed by me on the same day and co-pending one of the other of said applications being for art of anchorage, Serial No. 75,831 now Patent No. 1,784,755 granted Dec. 9, 1930; and the other for anchorage devices, Serial No. 75,832 now Patent No. 1,789,660 granted Jan. 20, 1931. Generic claims are presented in this application.

What is claimed is:—

1. Anchorage means comprising a sleeve rivet adapted to receive a rotary expander, said sleeve rivet having a lateral rib to prevent rotation, and a return fold to enable buckling located to first receive the action of such expander.

2. Anchorage means comprising a sleeve rivet having a return fold, and a screw-threaded fastening adapted to enter the material of the return fold for effecting riveting action.

3. Anchorage means comprising a sleeve rivet having a return fold portion within the sleeve, the return fold being longitudinally slotted, and a screw extending into the sleeve conditioned, proportioned and adapted to enter the material of the return fold portion thereof to advance said return fold portion within the sleeve between the surrounding wall of the sleeve and root diameter of the screw for wedging therebetween and buckling the sleeve and return fold portion to a riveting, looped condition.

4. The art of anchorage comprising advancing a wedging member into a sleeve rivet in engagement with a portion of the sleeve and causing such portion to be moved into the sleeve into a compact condition between the sleeve and wedging means.

In testimony whereof I affix my signature.
HEYMAN ROSENBERG.