Aug. 4, 1931. H. ROSENBERG 1,817,584

ANCHORAGE DEVICE

Filed Feb. 11, 1928

FIG. 1.

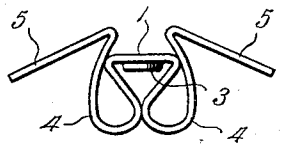


FIG. 2.

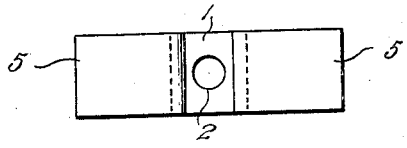


FIG. 3.

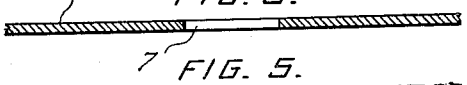


FIG. 4.

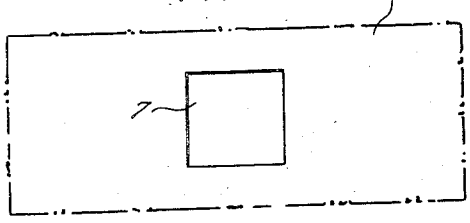


FIG. 5.

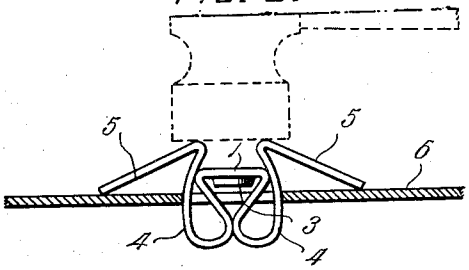


FIG. 6.

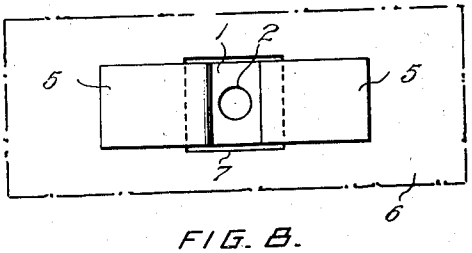


FIG. 7.

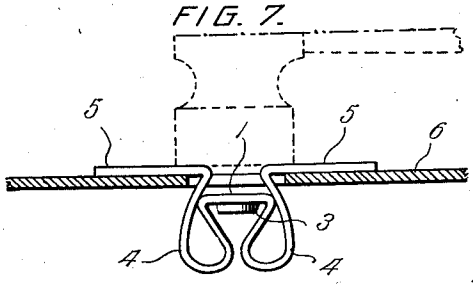


FIG. 8.

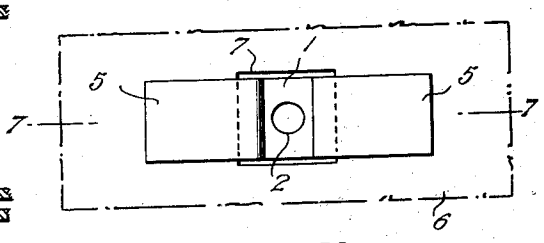


FIG. 9.

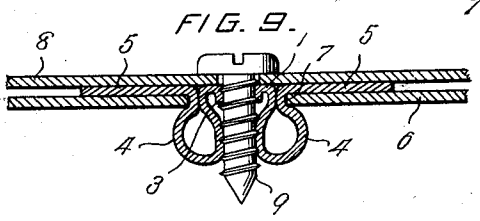


FIG. 11.

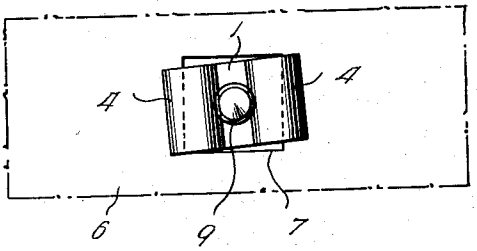
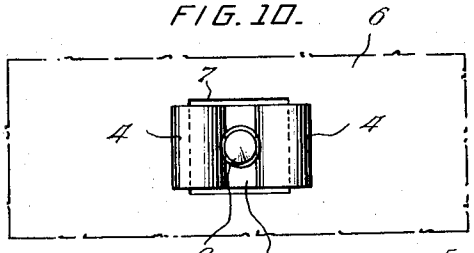


FIG. 10.



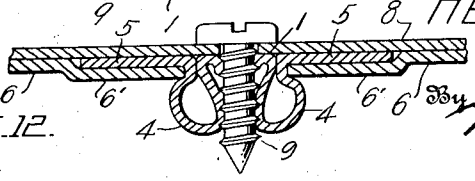


FIG. 12.

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his Attorney.

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UNITED STATES PATENT OFFICE

HEYMAN ROSENBERG, OF NEW YORK, N. Y.

ANCHORAGE DEVICE

Application filed February 11, 1928. Serial No. 253,755.

This invention relates to improvements in the art of anchorage especially to inaccessible or difficultly accessible work, and has as its primary object the combining of facility with effectiveness of anchorage.

A further object is provision for adjustment and variability of relative location of the anchorage.

More specifically, the invention comprehends means of purchase for an anchorage element, which means of purchase is adapted for relative variability of position without dislocation to an inoperative condition.

Among the further objects of the present invention is the anchorage of means of purchase from the accessible side of a wall or like work to the inaccessible side thereof.

Also, a still further object in view is the ready, easy, and effective introduction of such means of purchase to the inaccessible side of work from the accessible side thereof in a manner to cause anchorage of the means of purchase of such form as to permit variable accessibility.

With these and other objects in view, as will in part hereinafter be stated and in part become apparent, the invention comprises certain novel steps and combinations of steps in the art of anchorage, together with certain novel constructions, combinations, and arrangements of parts as will hereinafter become apparent and be subsequently pointed out in the appended claims.

Since the art or process may more readily be rendered clear by specific illustrative reference to preferred structures especially adapted for the practicing of the art, such structures will be described in detail, in the course of which description the steps of the art will be explained or become obvious.

In the accompanying drawings,

Figure 1 is a view in edge elevation of a preferred embodiment of floating purchase means incorporating features of the invention.

Figure 2 is a side elevation thereof, being in top plan relative to the location of the parts as seen in Figure 1.

Figure 3 is a section through a fragment of a wall or other work apertured to receive the parts shown in Figures 1 and 2.

Figure 4 is a view in side elevation of the parts seen in Figure 3.

Figure 5 is a view of the parts seen in Figures 1 and 2 in the course of being assembled, a fragment of assembling tool being indicated in dotted lines.

Figure 6 is a view similar to Figure 4 of the parts seen in Figure 5.

Figure 7 is a view similar to Figure 5 with the parts in the fully assembled position.

Figure 8 is a view similar to Figure 6 of the parts in the position seen in Figure 7.

Figure 9 is a view similar to Figure 7 with the purchase means also shown in section and the anchorage screw and anchored part illustrated as applied.

Figure 10 is a side elevation of the parts as seen in Figure 9 looking at the same from the inner or inaccessible side thereof.

Figure 11 is a view similar to Figure 10 showing the floating purchase means in a canted or skewed position.

Figure 12 is a view similar to Figure 9 showing the invention applied to a slightly modified condition of wall or like work.

In various industrial arts, such as automobile body construction, cornice work, ventilation ducts, and other sheet metal and like wall construction, it frequently occurs that anchorage must be had to a wall whose inner surface is either wholly inaccessible or accessible only with difficulty, and, in such instances, it is now almost the universal practice to use some form of anchorage device such as the types covered by my several United States Letters Patents numbered and dated respectively: 1,299,232, dated April 1, 1919; 1,411,184, dated March 28, 1922; 1,465,148, dated August 14, 1923; 1,482,151, dated January 29, 1924; 1,485,202, dated February 26, 1924; 1,526,182, dated February 10, 1925; 1,545,471, dated July 7, 1925.

Such anchorage devices are especially effective for this class of work, but it sometimes occurs that a further difficulty arises from the fact that a sheet, strip, or other part or wall is to be anchored to another sheet, strip, wall, or other work having an inacces-

sible or inner surface, and that definite spacing of the anchorage screw or pin in the superposed or exterior work is required. Even with the most careful templets, it is not always practicable to have apertures formed in the inner and outer pieces of work which register with precision, as, for example, when applying molding to the casing of a window frame in an automobile body structure. In such instances the anchorage pin or screw, when passed through a previously formed aperture in the molding or superposed work, may miss the aperture in the inner wall just enough to prevent making the needed connection or may just engage at the tip in a manner to cause the screw or anchorage pin to cant in approaching the seated position. It becomes desirable in such instances, therefore, to provide some means of purchase to the inner wall which is susceptible of at least a slight amount of floating movement or relative adjustability, so that an approaching entering tip of a fastening screw or pin will cause the purchase means to shift or float to a proper alinement and enable the production of an effective anchorage even when the pin or screw receiving apertures would not otherwise accurately register.

In such cases, attempts have been made to provide supplemental anchorage means, but so far as known to me, such attempts have not been successful for various reasons. One of such reasons lies in the difficulty of retaining a supplemental anchorage means or purchase means in place while leaving it free to float pending application of the anchoring screw or pin. The present invention overcomes all these difficulties and provides for successful anchorage including engagement with the inaccessible or inner face of the main or inner wall and at the same time provides a floating purchase means capable of such variations in location as may be required in practice.

For a detailed understanding of a preferred and very effective embodiment of the invention, reference is had to the first twelve figures of the accompanying drawings, in which 1 indicates the anchorage plate of the improved purchase means. Plate 1 is formed with an aperture 2 preferably surrounded by an inwardly-extending burr or boss 3. Reference here and hereinafter to "inward" relates to the direction toward the inaccessible surface of the work, and the opposite direction, for convenience and clarity of reference, will be called "outward", although, of course, the terms must conform in modification of meaning to modifying conditions and structures. Each end of plate 1 is formed integral with, or appropriately connected to, a loop or bulbous enlargement 4, each terminating in a laterally extending leg or wing 5. The parts thus far specifically mentioned are preferably formed of a strip of sheet metal, such as sheet steel or sheet iron, or other appropriate material; and, by preference, the material is semi-hard, but may be of varying hardness from soft to any degree of hardness susceptible of yielding as required for the functions hereinafter stated. By "hard", tempering is referred to, and may be effected by the cyanide or other acceptable process, and the distinctions of varying degrees from soft to hard refer to the accepted connotation of those terms as regularly employed by metal workers.

To provide the structure seen in Figure 1, flat strip is bent to produce loops 4, with plate 1 therebetween, and then bent to produce legs 5. The parts are proportioned to cause the loops 4 to lie close together or in actual contact before application. The aperture 2 is preferably formed by a stop punch gauged carefully to correspond to the anchorage screw to be used and should be slightly less in diameter than the root diameter of such screw. Of course, the aperture 2 may be formed by a shearing punch or a drill, but, in either case, will be properly gauged relative to the screw to be employed to insure entrance of the metal surrounding the aperture 2 and entrance of the burr 3 by the thread of the screw.

The wall 6 (of sheet metal or otherwise) is formed with an aperture 7 of a width and length to snugly accommodate the passage of loops 4; or the aperture 7 may be slightly shorter than the distance between the most remote points of loops 4, especially when the loops are sufficiently hard to possess a degree of resilience.

The parts are assembled by inserting the loops 4 through aperture or slot 7, as seen in Figure 5, and then pressing the parts inward to the position seen in Figure 7. If the semi-hard material with only a close fit of loops 4, when in the position of Figure 5, be employed, the parts will take the position of Figure 7 as a permanent shape until subjected to further treatment. It is to be noted that while moving inward through the aperture 7, the loops 4 were forced to spread apart by the action of legs 5 in changing the angle of jointure with the loops. Thus the loops 4, when in the position seen in Figure 7, have their most remote parts farther apart than when in the position of Figure 1. Thus the device of Figure 1 is loosely anchored in the wall or other work 6, and cannot accidentally escape therefrom, though free to "float" or move about slightly to accommodate slight variations in location of desired anchorage.

In instances where greater resiliency of the material of the structure seen in Figure 1 is employed than will allow the legs 5 to lie in the inner position of Figure 7, care must be exercised to provide loops 4 of requisite size and resiliency relative to aperture 7 to require springing through the aperture, as by

resilient elongation or nearer approach toward each other, so that they will spring out again and present obstructions preventing retrograde movement through aperture 7 after introduction therethrough. In either case, the balance of the anchoring operation is accomplished in substantially the same way.

The means of purchase specifically illustrated in Figure 1 having been assembled with the work 6, as in Figure 7, or in the more resilient form with legs 5 not flattened or so fully flattened, the work to be connected, such as strip or work 8, is placed against the outer face of wall 6 or against legs 5, and the legs thereby forced to the flattened condition of Figure 9, and an anchoring screw 9 is inserted through an aperture already provided in the strip 8. The screw 9 then has its entering tip introduced into or through aperture 2, and the screw is then threaded to the seated position of Figure 9. Screw 9, being of the "sheet metal screw" type, that is of the type covered by my above-identified patents, and being provided with threads hardened sufficiently for cutting or entering the material of plate 1 and loops 4, in the course of being rotated and thus screwed to its seated position, forms a thread in the surrounding walls of aperture 2 and boss 3, and partial threads in the contacting sides of loops 4. Loops 4, of course, move apart under the wedging action of the entering tip of screw 9, and the partial threads formed on the engaged sides of the loops will be of a depth and distinctiveness proportional to the resistance to lateral displacement, and will at all events afford additional anchorage for screw 9. Also, the lateral separation of loops 4 will cause proportionally greater parts of the loops to underlie the inner face of wall 6. As the screw 9 reaches its fully seated position, the loops 4 are moved to a position clamping the wall 6 and thus rigidly clamping strip or other work 8 to wall 6. This clamping action sometimes occurs merely incident to the distortion of loops 4 under the action of screw 9, and in that case, the parts are seated as seen in Figure 10. But, since the loops 4 are free to have movement in the direction of the length of aperture 7 before the final clamping by screw 9, and sometimes the width of aperture 7 is slightly or somewhat greater than the width of the strip of which loops 4 are formed, said loops 4 in the latter instance are free to turn a little and assume a skewed position as seen in Figure 11. At all events, when screw 9 is finally seated, part 8 is rigidly and permanently clamped to wall 6 and will not loosen even under the vibrations to which automobile parts are subjected. It will be understood, of course, that since the inner or inaccessible face of wall of work 6 is not exposed for observation, the exact location of the loops 4 whether in the idealized position indicated in Figure 10 or canted position of Figure 11 is immaterial so long as effective anchorage is provided.

It will be observed further that the plate 1 is of greater length than the distance between the folds of the strip at the juncture between legs 5 and loops 4. Such juncture is produced by an extension of the strip in each instance beyond the respective loop 4 in a position overhanging the plate 1, and even after the parts have been assembled, as seen in Figure 7, the overhanging condition still attains. When the screw 9 is being threaded home, and when the head of the screw is engaging the outer face of work 8, the further rotation of the screw will cause the plate 1 to travel along the screw toward a fully seated position, as indicated in Figure 9. Such travel is at the expense of a wedging action by the ends of the plate 1 against the overhanging extensions of the loops 4, which causes a spreading action thereof so that, when the parts reach the position seen in Figure 9, the legs 5 will be further apart than they are with the parts in the position seen in Figure 7. It will be observed that in Figure 9 the finally seated position indicated is idealized to the point of indicating a perfect anchorage with a substantially perfect alinement of the aperture in the work 8 with the aperture 2. If these idealized conditions are not present (and it should be understood that they are usually not present) the purchase means of Figure 1 will "float" or shift as required to bring about the proper alinement of aperture 2 with respect to the aperture in the work 8, and then, when the screw 9 is threaded home, one of the loops 4 will give in excess of the other to accommodate the varied relative condition so that the parts adjust themselves to whatever location may be required to provide an effective anchorage, and, in many instances, such an adjustment results in the impinging of one of the ends of plate 1 against the overhanging part before the plate reaches the position of Figure 9, and there the clamping action occurs, gripping the floating purchase means against the work 6 without the plate 1 reaching contact with work 8. Since each individual anchorage will have its own peculiar conditions, according to the relative locations of the apertures through which screw 9 is introduced, an infinite number of different positions are possible, and the purchase means of Figure 1 is purposely designed to enable accommodation of itself to such variations as are required to effect the desired anchorage of work 8 to work 6.

When the saving of space or closeness of fit is a factor, the strip or other work 8 may be caused to have perfect face contact with wall 6 by forming a depression 6', as seen in Figure 12, to accommodate the legs 5. As

the showing in Figure 12 is otherwise identical with that above described, the same reference numerals have been applied to corresponding parts.

There is a very substantial advantage provided in the present invention from the fact that the purchase-affording means are designed to be applied easily and quickly from the exterior and to remain in place indefinitely before being used. Multiple assemblage is thus facilitated.

It should be understood that the pressure exerted and the manner of its application for locating the purchase means of Figure 1 within the aperture in work may vary quite materially according to the work to be done and the type or character of stresses to be sustained. In ordinary automobile body construction where relatively thin sheet metal is employed, and the improved purchase means of the same gauge of material is being utilized, (an effective thickness for such purchase means is twenty-five thousandths of an inch) it will usually be preferable to seat the improved purchase device by a light hammer blow, but, for a person of good, strong fingers, it is not ordinarily impossible to seat the device by manual pressure only. However, a wide range of possibilities are obvious in this connection, and some difference of preference will be based on selection or personal opinion, without, however, departing from the spirit and scope of the invention.

Plate 1 is an anchorage-means receiver, in the sense of affording the needed purchase for the anchoring screw, and while said plate becomes in fact a nut or the equivalent thereof during use, it is of course obvious that other anchorage means and other forms of provision for purchase may be provided within the scope of the invention.

The invention of this application is distinguished from the subject matter of my co-pending applications, Serial Nos. 75,830 and 75,831, filed December 16, 1925, in that said co-pending applications disclose structures wherein no floating of the anchorage receiving means is provided for.

It should be understood from reference to my above identified patents that the screw 9 has its threads hardened sufficiently for entering metal such as soft iron or soft steel, substantially without injury to the threads, so that the entering of the purchase means is effected with great facility. Also, it should be observed that while reference has been made herein to a snug fit between the loops 4 and the aperture 7, such fit relates only to the sides of the loops and not the edges. It will be seen from such figures, as Figures 6, 8, 10, and 11, that the aperture 7 edgewise of the instrument seen in Figure 1 is purposely formed wider to carry out the intended purpose of permitting floating in any required direction.

My co-pending application Serial No. 545,606, filed June 19, 1931, is a division of this application, and in said divisional application the invention is claimed generically.

What is claimed is:—

1. In anchorage apparatus, the combination of an anchorage plate, anchor-receiving means integral with the plates, loops pendent from the plate and having return terminal portions extending past the plate, legs outstanding laterally from the said terminal portions, and an anchor extending from that side of the anchorage plate occupied by the legs between the legs into anchorage engagement with the anchorage-receiving means.

2. A purchase device for anchorage means comprising an achorage plate, loops pendent from the ends of the plate and having return portions extending past the plate, and legs outstanding laterally from said return portions, the loops being dimensioned to underlie the plate and to extend laterally beyond the limits of the plate for providing a restricted cross sectional area substantially at the place of the plate and greater cross sectional areas above and below the plate, whereby the said loops may be introduced through an aperture in work in a manner to allow the loops to underlie while the legs overlie the work and the plate is free incident to such restricted area for floating relative to the work.

3. A purchase device for anchorage means comprising an anchorage plate having a straight portion apertured to receive anchorage means, loops pendent from the ends of the straight portion and having return terminal portions extending past the straight portion, and legs outstanding laterally from the said terminal portions, the said loops being proportioned to lie sufficiently contiguous to each other to enable anchorage means engaging said straight portion to also have anchorage engagement with said loops.

4. In anchorage means, the combination of an anchor-receiving plate, loops pendent therefrom having return terminal portions extending past the plate, legs outstanding laterally from said terminal portions, and an anchor extending between said terminal portions and having anchorage engagement with the plate and extending beyond the plate into anchorage engagement with said loops.

5. In anchorage apparatus, the combination of an anchor-receiving plate, loops pendent therefrom having return terminal portions extending past the plate, and legs outstanding laterally from said terminal portions, the loops being proportioned to lie sufficiently contiguous to each other at the opposite side of the plate from the terminal

portions to enable anchorage means engaging said plate to have anchorage engagement with said loops, and an anchor extending from outward of the legs between the return terminal portions through and in anchoring engagement with the plate, that portion of the anchor extending inward beyond the plate extending between and having anchoring engagement with the loops.

6. A purchase device for anchorage means comprising an anchor-receiving plate, loops pendent therefrom and enlarged below the plate to underlie the plate and to extend sufficiently contiguous to each other to be adapted to be engaged by anchorage means extending through the plate, said loops having return terminal portions extending past the plate, and lateral extensions from said terminal portions.

7. A purchase device for anchorage means comprising an anchorage plate, loops extending from the plate in one direction and having return portions extending past the plate in the other direction and shaped to overlie the plate, and legs extending laterally from said return portions at a more acute angle than normally assumed by said legs with respect to said return portions when the legs are seated in operative relation to work.

In testimony whereof I affix my signature.

HEYMAN ROSENBERG.