Dec. 9, 1930. H. ROSENBERG 1,784,754

ART OF ANCHORAGE IN MASONRY

Filed April 12, 1923

Fig. 1.

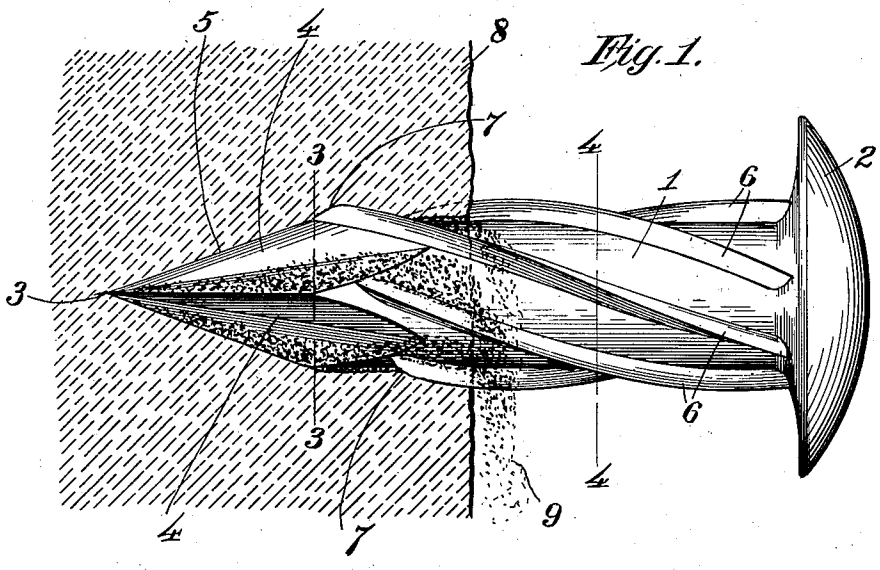


Fig. 3.

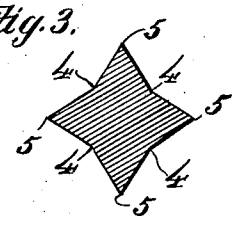


Fig. 4.

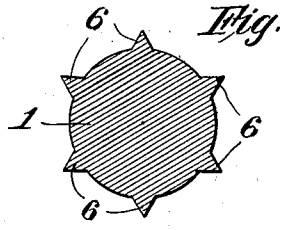
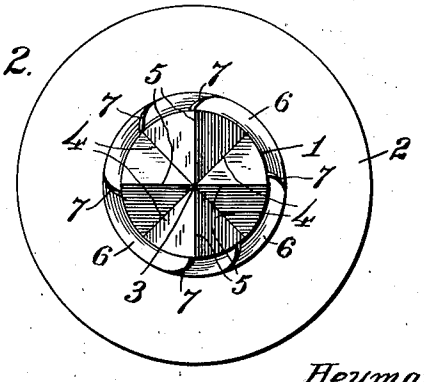


Fig. 2.



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UNITED STATES PATENT OFFICE

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ART OF ANCHORAGE IN MASONRY

Application filed April 12, 1923. Serial No. 631,592.

This invention relates to improvements in the art of anchorage to completed walls of masonry, such as brick, cement, porous tile, sand-stone, and like relatively inelastic substance having the capacity for being crumbled.

The object in view is the effective anchorage in or to such a wall of any article or of the anchor itself in a manner avoiding cracking or other injury to the wall and enabling the accomplishment of such anchorage with a minimum amount of labor and loss of time.

The art or process by which this is accomplished will be best understood by a detail description of the preferred construction and nature of the anchoring means to be employed, and to that end reference will be made to the structure shown in the accompanying drawings, in which—

Figure 1 is a view in side elevation of an anchoring device well adapted for carrying out the steps of the improved art or process, the device being shown as partly anchored in a wall and the wall being seen in section.

Figure 2 is an end view of said device detached, looking at the point.

Figures 3 and 4 are transverse sections therethrough taken on the planes indicated respectively by lines 3—3 and 4—4 of Figure 1.

Referring to the drawings by numerals, 1 indicates a cylindrical body preferably having a head at one end and terminating in a penetrating point 3 at the other. The point 3 is the product of the tapered end portion of the body 1, which tapered end portion instead of being finished like a cone is provided with longitudinal cut-away portions or grooves 4, 4 leaving cutting edges 5, 5. The cutting edges 5 converge at the point 3, and considering the device as arranged in a vertical position with the head uppermost, the said cutting edges extend upwardly and terminate at the surface of the body 1, the grooves 4 extending upward beyond the terminus of the cutting edges 5. There are preferably four of the grooves 4, making four of the cutting edges 5.

Formed integral with and outstanding from the body 1 are parallel ribs or threads 6, 6, each substantially triangular in cross section, as clearly seen in Figure 4, the apex of the triangle outstanding and the base blending into and formed integral with the body 1. Thus each thread or rib 6 is formed with a cutting edge throughout its length, and each rib or thread 6 preferably extends to and blends into the head 2 and also extends to the terminus of the full diameter of the body 1. That is to say, each rib or thread 6 extends to the margin of a groove 4, and at such margin terminates with a curved end portion 7 blending into the material of the body 1 and presenting a continuation, at the end of each rib 6, of the cutting edge of that rib. The number of ribs 6 like the number of grooves 4 may be varied, but there are preferably six ribs 6 arranged as shown in Figure 1, so that they may be said to be arranged in diametrically-opposite pairs, one pair being of greatest length, a second pair of intermediate length, and a third pair of shortest length presenting the stepped relation seen at the inner terminal portion of body 1 in Figure 1. The advantage of this relation will become apparent in the discussion hereinafter of the process to be carried out by the device. Each thread or rib 6 is given a slight pitch or angular slant about the body 1, and, in practice, each of the longest ribs or threads should extend one-third the way around the body in the length of the body, or, in other words, angularly 120° when the body is made one-fourth of an inch in diameter and one and three-eighths inches long from the point of blending into the head 2 to the outer terminus of one of the cutting edges 5. While the showing in the drawing is that of a much larger device or may be said to be greatly magnified, the proportions are maintained which will enable determination of the preferred relative transverse area of each rib or thread 6.

The body 1 and its connected parts are formed preferably of soft steel and then case-hardened. The preferable method of case-hardening is known as the cyanide process, but it should be understood that the essential characteristic of the finished structure is its effective hardness, especially of

those parts employed for cutting, as hereinafter stated, and it is not a part of the present invention as to how the hardening is effected. It is of primal importance, however, that the penetrating point with its cutting edges 5 and the ribs or threads 6 shall be of sufficient hardness to cut the wall into which the parts are to be forced with substantially no injury to the point or threads. It should thus be apparent that the body 1 itself and the head 2 do not require hardening, but when the device is hardened by the cyaniding process, these parts are hardened as an incident, and the hardened condition may be of value in preventing injury to the surface of the body in contacting with abrasive portions of the wall into which it enters.

In carrying out the present improved art or process, the operator manually holds the body 1 in position with the point 3 contacting with the surface of the wall to receive the anchor, such as wall 8, and then taps with a hammer on the head 2 while manually rotating or moving the body 1 angularly so that the penetrating point enters the wall after the fashion of a masonry drill. This action is kept up until the longest threads of threads 6 come in contact with the exposed surface of the wall 8. The operator then discontinues the rotary motion and taps the head 2 for driving the anchor directly into the wall, and in so doing causes the longest threads 6 to enter the wall and cause the body 1 to rotate slightly as it advances, and then the second or intermediate length threads engage the wall, and finally the shortest threads engage the wall, and all tend to turn the anchor on its longitudinal axis. The rounded ends 7 of the threads 6 insure ready entry of the threads in the body of the wall 8 in a manner to form grooves in such wall, which grooves accommodate the threads and provide for effective anchorage thereof and of the body 1. It should be understood that any masonry substance susceptible of being crumbled by the drill action of a penetrating point will have a hole or recess formed in it by the initial action above described of slightly greater diameter than the diameter of the body 1, so that as the anchor is driven further in during engagement of the threads 6 with the wall, a slight space is left between the surrounding wall and the entered portions of the body 1, through which space escapes the crumbled substance indicated at 9 in Figure 1. Both the initial opening and the recess subsequently formed by the point incident to the rotary action of the threads as the anchor advances into the wall 8 is larger than body 1, so as to accommodate the passage of crumbled substance. This crumbled substance is continuously forming as the anchor is driven further and further in, and as the crumbled substance forms in the grooves 4 it follows the grooves outward into the spaces or valleys between the threads or ribs 6, and then follows those valleys, as clearly shown in Figure 1, until it drops along the outer face of the wall 8. This action is continued until the anchor penetrates the wall to the required extent. If the anchor alone is intended to engage the wall, as shown in the drawing, it is left at any point desired in a location with the head 2 either resting against the wall or spaced therefrom to the distance required, according to the use to be subsequently made of the anchor. It is obvious, of course, that when a board or strip of material is to be fastened to the wall, the anchor is passed through such board or strip of material before the final driving action occurs, that is, the action after the threads 6 begin to penetrate the wall 8.

If, in the forming of the entering opening in a wall, that is the opening up to the point where the threads 6 begin to act, difficulty is experienced in manipulating the anchorage device after the manner described, it is, of course, entirely practical to use a masonry drill of the proper diameter and of greater length than the anchorage device so as to enable and facilitate easy manual manipulation, and the drill is preferably operated only sufficiently for producing the initial opening in the wall of a depth required to allow the threads 6 to begin to act. It will be noted also that if such a drill should be used until a bore or opening is formed in the wall of practically the length of the body of the anchoring device, such anchoring device could be effectively applied by being driven into such opening while the threads or ribs 6 cut their way and form co-operating anchoring grooves. The drill, when used, must be of the requisite diameter, approximately identical with that of the body portion 1, for producing an opening or bore in the wall of a diameter only slightly larger than the diameter of said body portion 1, the increased diameter of the bore being due, as above stated, to the characteristic of the material of the wall which causes it to crumble when cut or broken.

It will be observed also that in whatever way the process is carried out, the anchoring device does not injuriously wedge the material of wall 8 apart, and, therefore, does not tend to split or crack the same. The action is one of cutting away and crumbling a substance of the wall and not of expanding it, such as might occur were the same instrument driven into a piece of wood or like elastic material.

No claim is made herein to structure since the structure is covered specifically in my Patent No. 1,485,202, granted February 26, 1924, on an application pending conjointly herewith and filed April 12, 1923, Serial No.

631,591, and the structure being also generically claimed in my co-pending application Serial No. 688,423, filed January 25, 1924.

What is claimed is:—

In the art of anchorage in hard masonry such as cement, concrete, brick, or natural stone, forming an entering opening in masonry of less length than the length of the portion of the anchorage device to be inserted, axially inserting an anchorage device in said opening, the body of said anchorage device being of less diameter than that of the opening and having ribs outstanding beyond the lateral limits of the opening, and delivering a series of hammer taps on the exposed portion of the anchorage device axially thereof for advancing the anchorage device with a succession of jumps corresponding to the number of taps, the taps being delivered of such character as to allow the crumbled material of the masonry to find its way out along the anchorage device in the valleys between the ribs.

In testimony whereof I affix my signature.

HEYMAN ROSENBERG.