No. 806,406. PATENTED DEC. 5, 1905.

H. FARRINGTON.

EXPANSIBLE WEDGE.

APPLICATION FILED DEC. 3, 1904.

Fig: 1,

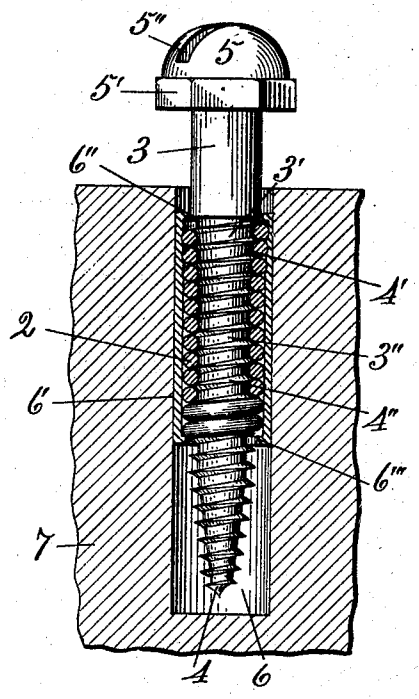


Fig: 2,

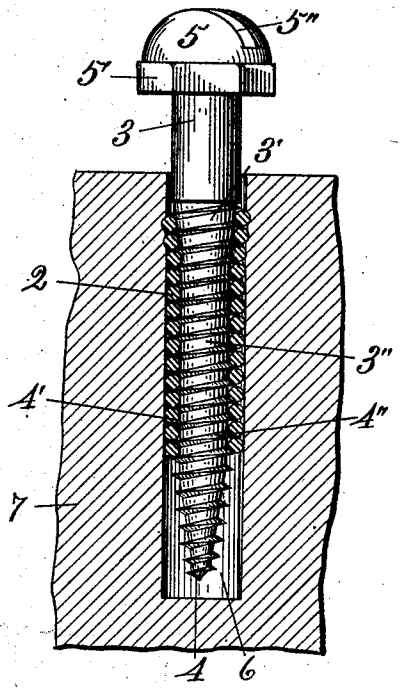


Fig: 3,

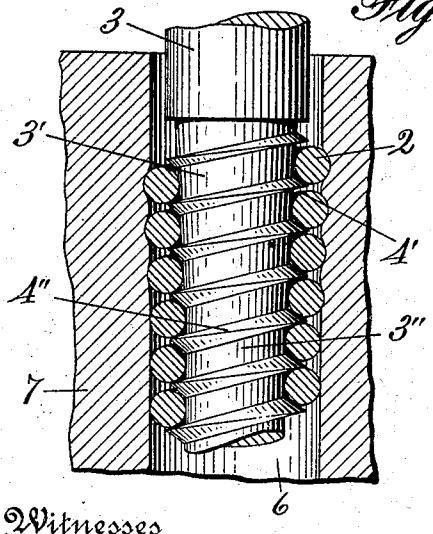
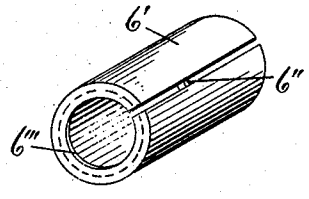


Fig: 4



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EXPANSIBLE WEDGE.

No. 806,406. Specification of Letters Patent. Patented Dec. 5, 1905.

Application filed December 3, 1904. Serial No. 235,313.

To all whom it may concern:

Be it known that I, HARVEY FARRINGTON, a citizen of the United States, and a resident of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Expansible Bolts, which improvements are fully set forth in the following specification.

This invention relates to devices for exerting an expansive force either for the purpose of disrupting a surrounding body or for locking the device into a surrounding body, as in the case of "anchor-bolts" or lewises; and more particularly it relates to devices for this purpose wherein the expansion is accomplished by means of a rotary expander acting on an expansible spiral keeper or an expansible sleeve conjoined with said keeper.

The object of my invention is to provide means for disrupting or cleaving masses of stone, wood, or other material or for locking an anchor-bolt or lewis within a surrounding mass of material and to accomplish this by making use of the power of a screw, yet without the necessity of using screw-threads in the material to which the device is to be applied.

The invention consists in certain combinations and arrangements of parts and certain details of construction, all of which will be more specifically hereinafter referred to, and set forth in the appended claims.

The invention is clearly illustrated in the accompanying drawings, wherein similar reference characters denote like parts throughout the several views.

In said drawings, Figure 1 is an elevation, partly in section, of an expansible bolt embodying my said improvements, there being shown in section, in conjunction therewith and to better illustrate the practical application thereof, a fragment of a socketed or recessed body or object, as a marble slab, cement block, stone, or the like. Fig. 2 is a view similar to Fig. 1, showing the device applied for service with its keeper-socket removed. Fig. 3 is a fragmentary sectional view mainly similar to Fig. 2, the scale being enlarged over that of Figs. 1 and 2 to more clearly illustrate the mode of operation of the device. Fig. 4 is a perspective view of the keeper-socket aforenamed detached from the general construction.

My invention comprises, in a general sense, an elongated screw-threaded expander and a spiral somewhat-yielding keeper surrounding the expander and engaging the screw-threads thereof, the cross-sectional contour of the spiral keeper being such that the friction between said keeper and said expander or the screw-threads of the latter is reduced to a minimum, while at the same time said keeper presents at its outer side an adequate frictional spiral contact-face for bearing against the surrounding surface of its inclosing mass or against the interior surface of an expansible socket which may be used to house said keeper.

Having reference to the accompanying drawings, 2 denotes a keeper formed from any suitable material, though by preference a material somewhat yielding or resilient, as brass, or capable of being tempered or rendered more or less resilient, as steel wire, said keeper having the general contour or form of a spiral and being expansible approximately circumferentially.

In conjunction with the keeper 2 I purpose to make use of an expander, the same being here shown as taking the general form of a bolt and comprising a main portion 3 of a given suitable diameter and of any appropriate contour in cross-section, a medial tapered portion 3′, merging at its smaller diameter into a reduced portion 3″, the latter being of a uniform diameter, though reduced as compared with the diameter of the portion 3 and preferably terminating in a tapered tip 4. It is essential that the tapered portion 3′ be provided with a spiral recess, as 4′, for the reception of one or more of such of the coils of the keeper 2 as may be found desirable in practice to expand, said recess being formed in this instance by the rib or web 4″, which spirally traverses the tapered portion 3′ and approximates the character of a screw-thread. I prefer that the recess 4′ be extended also continuously along the reduced portion 3″ and likewise along the tapered tip 4, which extension of said recess, as will be readily understood, may be duly and conveniently accomplished by accordingly extending the rib or web 4″, and in any event when said recess is occupied by one or more of the coils of the keeper 2 the latter may be treated as taking somewhat into said expander.

The expander aforenamed is ordinarily and by preference provided with a head 5, which may be formed many-sided, as at 5′, for the application thereto of a suitable manipulating or operating tool or implement, as a wrench, or slotted, as at 5″, for the application thereto of another form of manipulating or operating tool or implement, as a screw-driver.

In many instances, particularly where the pocket 6, designed to receive the device as a whole, is formed in material somewhat malleable, and it becomes desirable to interpose between the keeper 2 and the wall of said pocket an element whereby an extensive frictional holding effect may be had on said wall and without appreciable indentation thereof, I provide a circumferentially-expansible socket or shell 6′, here shown as taking the character of a longitudinally-split sleeve having inturned annular lips or flanges 6″ 6‴ at its respective ends and containing and substantially housing the keeper 2, the latter being disposed or adjusted within said socket prior to the formation of either or both of the lips or flanges 6″ 6‴. The socket or shell 6′ may be produced from any suitable material, though a material having some resiliency or admitting of being given more or less resiliency, as brass or steel in sheet form, is preferred.

The keeper 2 is preferably formed from a piece of stock or wire circular in cross-section, uniform in diameter throughout its length, whereby a line-contact is secured spirally between said keeper and said expander and friction in the operation of the device is accordingly materially reduced, while the corresponding outer face thereof has a substantial bearing on the surrounding mass, in connection with which the device may be used, particularly when the coils of said keeper are caused to penetrate somewhat said mass, as shown. The foregoing remarks apply also where the socket or shell 6′ is availed of, it being only necessary, as will be readily understood, to make the opening or pocket 6 of a diameter sufficiently large to receive the device with the socket or shell aforenamed applied thereto.

In applying my improved expansible bolt to practical purposes a pocket 6 of suitable diameter is formed in the usual way in a stone, cement block, beam, marble slab, or other desired body or object, a fragment thereof being shown in the drawings and denoted by the reference-numeral 7. Then the device, with or without the socket or shell 6′ and with the keeper 2 adjusted wholly or partially along the reduced portion 3″ of the expander aforenamed and in readiness for occupancy of the recess 4′, spirally traversing the tapered portion 3′ of said expander, is inserted into the pocket 6, with its headed portion projecting therefrom, whereupon, by means of a suitable tool or implement applied as to the head 5, the expander aforenamed is rotated in a direction proper to urge it homeward, with the result that a coil or a plurality of the coils of the keeper 2 is or are caused to occupy said recess spirally traversing the tapered portion 3′ and is or are expanded through the medium of said tapered portion laterally or substantially circumferentially for a wedging, binding, or locking action on the wall of the pocket 6, such wedging, binding, or locking action being applied directly to such wall or indirectly thereto through the medium of the socket or shell 6′, the latter being expansible circumferentially, as hereinbefore stated.

Where the body or object in conjunction with which my improved device is being used is formed from or consists of material more or less malleable, the coil or coils of the keeper 2 when expanded, as above stated, will tend to indent or become embedded somewhat in the wall of the pocket 6, as more clearly illustrated in Fig. 3, and where this indenting effect is not desired the socket or shell 6′ may be availed of, as hereinbefore alluded to.

My improved expansible bolt will be found highly serviceable in the operation of hoisting stones, cement blocks, and similar bodies or objects, splitting or severing the same, a plurality of said bolts being ordinarily used in this connection and a like number of pockets 6, each to receive one of said bolts, being formed in the body or object which it is desired to thus split or sever, as a terminal post for a switchboard, as a means for locking or retaining one article or object in conjunction with or upon another, and, in fact, in a multiplicity of situations where it is desired to lock or fasten a member, such as 3, whether headed or not, in position for service or to utilize the wedging power or effect of the device as a whole for locking, severing, or grappling purposes. Hence it will be seen that my improved expansible bolt is well adapted for the purposes for which it is designed, and, further, that the same may be modified to a considerable extent, particularly as regards the cross-sectional contour and character of the stock from which the keeper 2 is formed, the manner of providing the recess 4′, the relative arrangement or disposition of the rib or web 4″ with respect to the expander of the device, the character and material of the socket or shell 6′, the extent of the taper 3′, and various minor details of construction of the separate parts or elements of the device without materially departing from the spirit and principle of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a device of the class herein described, the combination with an elongated, tapering, screw-threaded expander, and a spiral keeper surrounding the same and engaging with the screw-threads thereof, of a circumferentially-expansible socket, surrounding said keeper and adapted to be acted upon and circumferentially expanded, upon the insertion and rotation of said expander in said keeper, substantially as herein specified.

2. In a device of the class herein described, the combination with a tapering, elongated, screw-threaded expander, and a spiral keeper

surrounding the same and engaging with the screw-threads thereof, of a circumferentially-expansible socket surrounding said keeper and inclosing the same, said socket having inturned lips at its respective ends, whereby said keeper is retained in position within said socket, substantially as herein specified.

3. An expansible bolt comprising a screw-threaded expander and a spiral expansible keeper surrounding the same and engaging with the screw-threads thereof, of a circumferentially-expansible socket surrounding said keeper and adapted to be acted upon and expanded upon the insertion and rotation of said expander in said keeper.

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Witnesses:
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