

No. 806,407.

PATENTED DEC. 5, 1905.

H. FARRINGTON.
EXPANSIBLE WEDGE.
APPLICATION FILED DEC. 9, 1904.

Fig. 1,

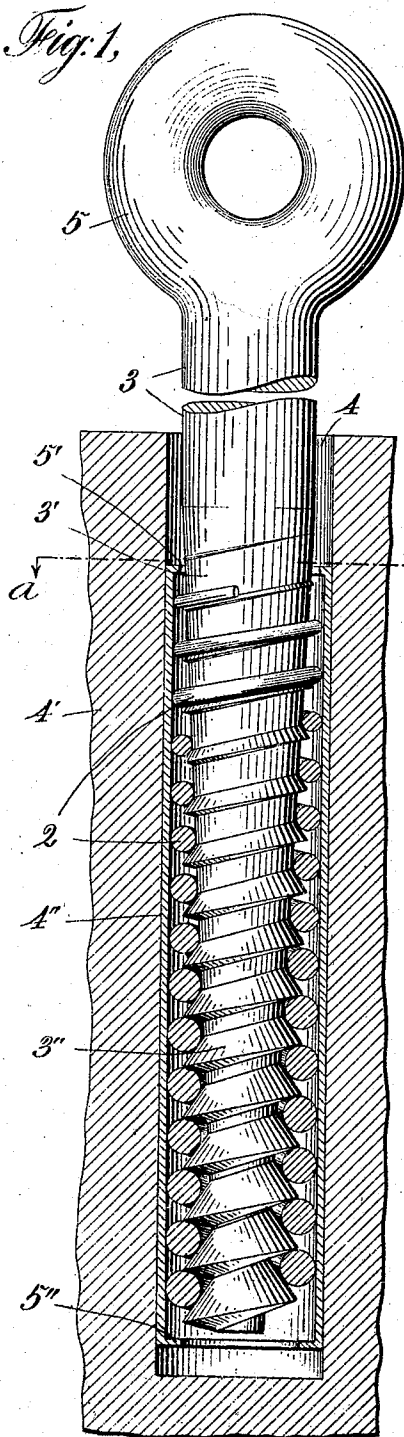


Fig. 2,

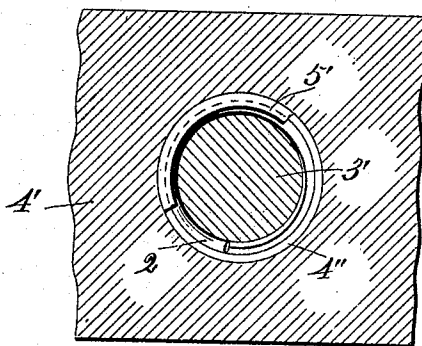


Fig. 3,

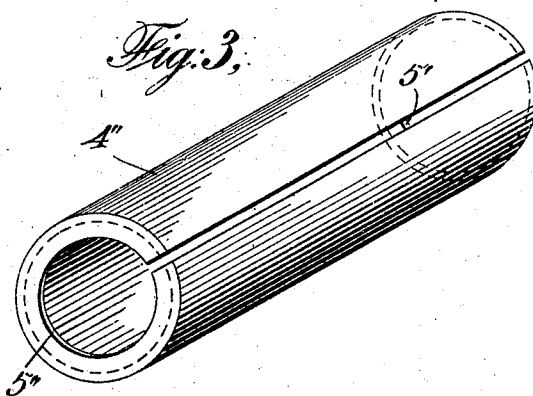
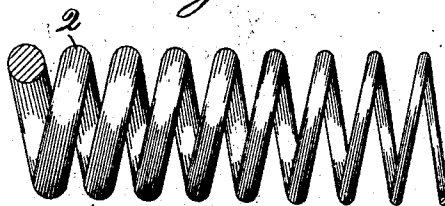


Fig. 4,



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UNITED STATES PATENT OFFICE

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EXPANSIBLE WEDGE.

No. 806,407.

Specification of Letters Patent.

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Application filed December 9, 1904. Serial No. 236,181.

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 Wedges, which improvements are fully set forth in the following specification.

This invention relates to improvements in expansible devices of that class ordinarily availed of for exerting a force of variable intensity for locking, grappling, severing, or analogous purposes, as made expedient by the conditions or circumstances involved in the practical use thereof, such devices being well designated "expansible wedges."

The object of this invention is to provide a device of the character above indicated which shall be simple and inexpensive as regards construction, durable, efficient, and reliable in practical service, convenient in its application to practical purposes, which shall embody novel features of construction whereby is rendered practicable the generation and maintenance of a force for locking, grappling, severing, or analogous purposes, and the varying within wide limits of the intensity of such force for distribution—that is, from a moderate intensity for ordinary locking purposes to an exceptionally high intensity for severing, grappling, or similar purposes—and which shall possess certain well-defined advantages over prior analogous devices.

The invention consists in the novel disposition and relative arrangement of the respective cooperating parts or elements thereof whereby the attainment of the foregoing object is rendered practicable, in certain combinations, and in certain details of construction, all of which will be specifically referred to hereinafter 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 wedge embodying my said improvements, there being shown in vertical section in conjunction therewith and to better illustrate the practical application thereof a fragment of a body or an

object, as a cement or marble block, stone, or the like, having a pocket to receive the device for service. Fig. 2 is a transverse sectional view, the section being taken above the spiral keeper and the latter's containing-socket as on line *a a* of Fig. 1, a body or an object such as above referred to as receiving said wedge for service being shown in horizontal section in conjunction therewith. Fig. 3 is a perspective view of the socket aforementioned detached from the general construction. Fig. 4 is a side elevation of the spiral keeper aforementioned detached from the general construction.

In a general sense my present invention comprises an elongated rotatable expander traversed to a greater or less extent by a spiral wedge-face and a spiral keeper, the latter being engaged by the wedge-face aforementioned and through the medium of which said keeper may be brought directly or indirectly into a locking engagement with or caused to grapple or impinge upon or exert a severing effect upon another object or structure upon said expander being suitably rotated.

It further comprises, in a general sense, an expander and a keeper of the type respectively above specified and a circumferentially-expansible socket or shell, said expander and keeper being relatively arranged for cooperation substantially as above explained and said socket or shell containing and substantially housing said keeper.

Having reference to the accompanying drawings, 2 denotes a keeper formed from any suitable material, as brass, steel, alloyed metal, or the like, said keeper having the general contour or form of a spiral.

In conjunction with the keeper 2 I purpose to make use of an elongated rotatable expander, the same being here illustrated as comprising a main portion 3 of a given suitable diameter and of any appropriate contour in cross-section and a tapered portion 3', the latter formed in continuation of said main portion and being traversed wholly or partially by a spiral wedge-face 3'', which bears a cooperative relation to the keeper 2 when the parts are assembled and as will be hereinafter more fully explained. In this instance the wedge-face 3'' continuously tapers in width throughout its course spirally along the tapered portion 3' from the tip of the lat-

ter to its point of intersection with the main member 3 and inversely to the taper of said portion 3', the raised convolutions forming said wedge-face being accordingly variably spaced along said tapered portion and said wedge-face being inclined away from the axis and in the direction of the tip of said expander for a purpose which will more clearly hereinafter appear. This wedge-face varies in height from end to end, its greatest height being at the entering end of the bolt, so that the lower coils of the keeper hereinafter described will be expanded slightly more than the upper coils thereof. I prefer also that the general spiral figure or contour of the wedge-face 3'' shall taper toward the tip of the expander aforementioned and at variance with the inclination of the tapered portion 3', as clearly indicated in the drawings. Now to the end that the expanding effect on the keeper 2, as through the medium of the expander aforementioned properly manipulated and as will be hereinafter explained, may be distributed universally or entirely over the keeper 2, and hence not localized with respect thereto, said keeper comprises a series of spirals or convolutions formed in continuity and continuously tapered from a given maximum diameter to a given minimum diameter considered with reference to the cross-sectional contour of the end segments, respectively, of said keeper, the normal state of the latter accordingly being such that when it (the said keeper) shall have been partially adjusted along the tapered portion 3', with the wedge-face 3'' engaging it between the coils or convolutions thereof, as clearly indicated in the drawings, any rotative action given to the expander aforementioned in the direction to impel it homeward will result, through the medium of the inclination of the tapered portion 3' in conjunction with the wedge-face 3'' in said keeper being universally expanded circumferentially or in all lateral directions with respect to the expander aforementioned for a locking, binding, severing, grappling, or similar effect, as directly on the wall of a pocket 4, formed in a body or an object 4', or indirectly thereon, as by way of a circumferentially-expandable socket 4'', to be hereinafter more particularly referred to, said wedge-face under these conditions and by reason of its inclination away from the axis and in the direction of the tip of said expander alone presenting to and maintaining upon said keeper a wedging or locking force adapted to increase in intensity or resisting action proportionately to any force or pull which may be applied to said expander and calculated to withdraw the same from the pocket 4.

More specifically, the outermost points of the keeper 2, considered with reference to

the longitudinal axis thereof, constitute under normal conditions—that is, before said expander shall have been inserted to any material extent into said keeper—a general spiral of less diameter than the greater diameter of the tapered portion 3', and upon said expander being duly manipulated or rotated, as stated, these outermost points of the keeper 2 are urged by the movement of said expander into said keeper radially and in unison outwardly from said expander and proportionately to the degree of entrance of said expander into said keeper, thus permitting the intensity of the locking, binding, or analogous action of the device as a whole to be varied at the will of the user.

The expander aforementioned is ordinarily and by preference provided with a suitable head for the application thereto of a suitable manipulating or operating tool, implement, or accessory, said head in this instance being denoted by the reference-numeral 5 and taking the form of an enlarged eye.

The keeper 2 is preferably formed from a piece of stock or wire having some resiliency, as brass, or capable of being given some resiliency, as steel, circular in cross-section at all points therealong and gradually tapering from one end to the other thereof, all as clearly shown in the drawings, said keeper in practice being inversely applied to the expander aforementioned relatively to its greater end segment diameter and the greater diameter of the tapered portion of said expander.

In many instances, particularly where the pocket 4, 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 without appreciable indentation thereof, I provide a circumferentially-expandable socket or shell 4'', here shown as taking the character of a longitudinally-split sleeve having inturned annular lips or flanges 5' 5'' at its respective ends and containing and substantially housing the keeper 2, the latter being disposed or adjusted within said socket previously to the formation of either or both of the lips or flanges 5' 5''. The socket or shell 4'' 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, respectively, is preferred.

In applying my improved expandable wedge to practical purposes a pocket 4 of suitable diameter is formed in the usual way in a stone, cement block, beam, marble slab, or other desired body or object 4', a fragment of which is illustrated in the drawings.

Then the device, with or without the socket or shell 4" and with the keeper 2 adjusted partially along the tapered portion 3' and engaging the wedge-face 3" in readiness for service, is inserted into the pocket 4 with its headed portion projecting therefrom, whereupon by means of a suitable tool or implement applied, as to the head 5, the expander
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said pocket, all as may become desirable in the practical operation of the device. Hence it will be seen that my improved expansible wedge 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 or material from which the keeper 2 is formed, the manner of providing the wedge-face 3", the relative arrangement or disposition of said wedge-face with respect to the expander of the device, the character and material of the socket or shell 4, the length of the tapered portion 3', and various other 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. An expansible wedge comprising an elongated, rotatable, tapered expander, traversed by a spiral wedge-face, and a spiral keeper whose end segments vary from a maximum diameter to a minimum diameter, respectively, said keeper being adjusted along said expander inversely to the taper thereof, and relatively to the greater diameter of the tapered portion of said expander and the greater end segment diameter of said keeper, and engaging said wedge-face to receive from the latter an expanding force, upon said expander being duly rotated, substantially as herein specified.

2. An expansible wedge comprising an elongated, rotatable, tapered expander, traversed by a spiral raised member varying in height from end to end and forming a spiral wedge-face, and a spiral keeper, said keeper being formed from a piece of stock or wire continuously tapered from one end to the other thereof, and engaging said wedge-face to receive therefrom an expanding force, upon said expander being duly rotated, substantially as herein specified, the keeper being tapered inversely to the taper of the expander.

3. An expansible wedge comprising an elongated rotatable expander traversed by a spiral wedge-face or thread having one face inclined away from the longitudinal axis and in the direction of the tip of the expander, its other face being perpendicular to the longitudinal line of the expander, and a spiral keeper engaging said wedge-face and adapted to be expanded in all directions upon the rotation of the expander.

4. An expansible wedge comprising a rotatable expander formed with a spiral wedge-face or thread and a spiral keeper formed of wire or stock tapered from end to end and formed into a spiral whose internal diam-

eter decreases toward one end and whose external diameter is substantially uniform from end to end.

- 5 5. An expansible wedge comprising a rotatable tapered expander, said expander tapering toward its entering end and formed with a spiral thread or wedge-face, and a continuous spirally-wound expansible keeper tapered internal to correspond to the taper

of the expander and adapted to engage the spiral thread of the expander and to be expanded on the rotation of the expander in the proper direction.

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Witnesses:

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A. W. KURZ.