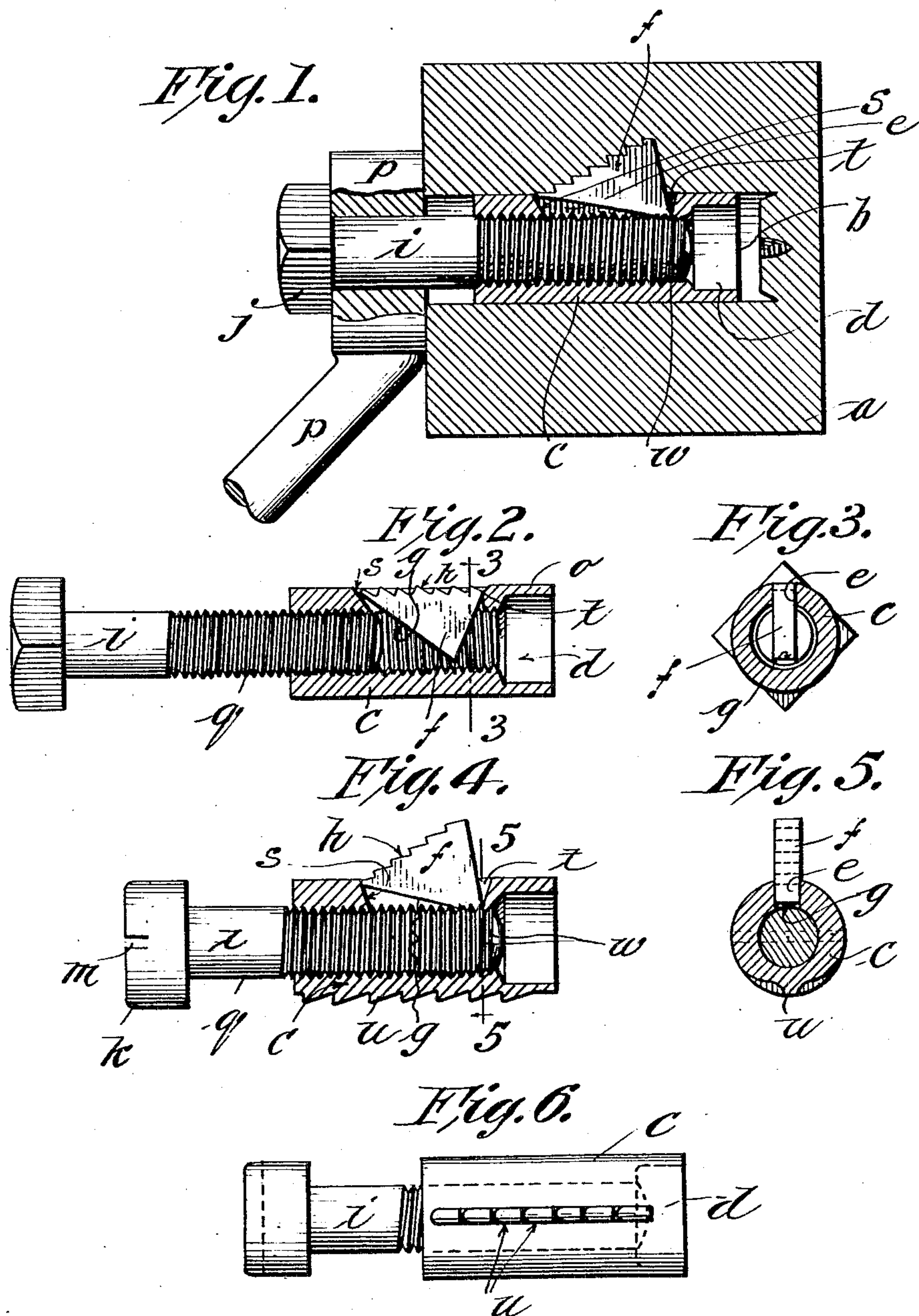


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J. S. HANLON.
EXPANSION NUT.

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JOHN S. HANLON, OF CHICOPEE, MASSACHUSETTS.

EXPANSION-NUT.

No. 843,271.

Specification of Letters Patent.

Patented Feb. 5, 1907.

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To all whom it may concern:

Be it known that I, JOHN S. HANLON, a citizen of the United States of America, residing at Willimansett, in Chicopee, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Expansion-Nuts, of which the following is a specification.

This invention relates to the class of improvements in expansion-nuts which are used to rigidly secure together two pieces of material of any suitable kind, as wood and iron, iron and masonry, or concrete and wood, &c.; and it has for its object to provide a means which can be quickly and easily secured in place to attain the desired result.

The invention is fully illustrated in the accompanying drawings, and more particularly defined by the scope of the claims.

In the drawings forming part of this application, Figure 1 is a sectional view of the improvement as used. Fig. 2 is a longitudinal sectional view of the improvement. Fig. 3 is a vertical section on the line 3 3, Fig. 2, taken through the key and barrel of the nut. Fig. 4 is a sectional view of a modification through the longitudinal slot in the barrel, showing the key after it has been pushed outwardly by the bolt after it has been screwed into the barrel and also showing holding-teeth on the bottom of the barrel. Fig. 5 is a vertical section through the barrel on the line 5 5, Fig. 4. Fig. 6 is a bottom plan view of the modification of the barrel, showing teeth or lugs diametrically opposite the key.

Referring to the drawings, *a* designates a part of the material in which the barrel of the improved nut is to be inserted.

b indicates the bottom of the hole made by an ordinary bit in case the nut is to be inserted in wood.

c designates the barrel of the nut, which is generally of iron or any suitable material. This barrel is internally threaded for a greater portion of its length, as shown, while *d* designates the bored-out end of the barrel of larger diameter than the threaded portion.

e indicates a vertical slot, which is cut lengthwise of the barrel and opening into the threaded portion and in which is adapted to be inserted a key *f*, made of iron, steel, or any suitable material. The shape of this key is triangular, the lower side of which has a smooth surface, (designated by *g*,) as clearly shown in the drawings, while the upper edge

of the key is provided with teeth or serrations *h*, that point outwardly.

i designates the threaded bolt, of any standard size, with a squared head *j* (shown in Fig. 1) and adapted to be turned by a wrench in the ordinary manner, while Fig. 4 shows the ordinary machine-made bolt having a head *k*, with a transverse slot *m* therein when the bolt is to be turned by a screw-driver.

Referring particularly to Fig. 2, it is seen that the bolt *i* is turned outwardly, so that the teeth of the key *f* are flush with the outer edge or periphery of the hole of the barrel. When the key *f* and bolt *i* are in this position, the nut can be readily inserted into a circular opening, which has previously been made in the woodwork or masonry of the structure, to which it is desired that a piece or attachment, as *p*, (shown in Fig. 1,) may be rigidly secured.

In the operation of this expansion-nut upon turning the bolt *i* into the barrel *c* the threads *q* thereon will slightly embed themselves into the key *f*, while at the same time the key *f* is forced outwardly by reason of the threaded end of the bolt engaging the inclined surface of the key when it stands in this position, as shown in Fig. 2, and by the continued pressure of the bolt *i* thereon the key is forced or embedded into the material, whatever it may be—as wood, brickwork, or masonry construction—the bolt *i* being rotated until the head *j* is brought firmly against the piece or attachment *p*. In forcing the key *f* outward the threads on the end of the bolt are necessarily mutilated when the same are embedded into the key. The slot *e* is preferably made by milling, which operation produces at the same time the inclined shoulders *s* and *t*. The slot *e* is milled of such a length that the inclined shoulders serve the purpose of preventing the key *f* from dropping inward into the barrel. When the bolt is screwed into the barrel, the forward end of the key is first moved outward, the rear shoulder *t* preventing the key from being moved rearward by the bolt. When the forward end of the key has been raised for a certain distance by the inward movement of the bolt *i*, the key is rocked about the forward end of the bolt, throwing the rear end of the key outward into the position shown in Fig. 4. This rocking movement of the key is produced by the forward end of the key being elevated first until sufficient resist-

ance in the material *a* to its further movement is met, when this resistance will serve to rock the key on the end of the bolt *i*, as the same is screwed into the barrel to throw out the rear end of the same, the key then assuming the position shown in Figs. 1 and 4. These two shoulders *s* and *t* serve the further purpose of preventing the nut from being drawn outward or forced inward after the bolt has elevated the key to the position shown. These shoulders serve to lock the key to the barrel when in place, as easily understood. The expansion-nut in this position securely holds the attachment in place.

By means of the threads *q* cutting into the key *f* the expansion-nut is provided with a securing means in addition to that afforded by the teeth *h* on the wedge. The mutilated teeth are shown at *w* in Figs. 1 and 4.

Referring to the modification shown in Figs. 4, 5, and 6, the barrel *c* is provided with teeth or serrations *u* on the opposite side of the same, the purpose of these teeth being that as the key *f* is forced outwardly on one side of the barrel the teeth *u* on the opposite side of the barrel are at the same time embedded in the material on that side of the barrel. This construction has the advantage of producing an even pressure on opposite sides of the barrel.

One of the advantages of this improved expansion-nut is that it is adapted to be used with bolts of ordinary standard gage.

One of the advantages of the enlarged bored end *d* of the barrel *c* is that it provides a receptacle in which the loose material or borings of the hole may be collected, and thus avoids exercising any great care by the workman in thoroughly cleaning after the hole is bored or drilled.

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

1. In an expansion-nut, a barrel internally threaded for a greater part of its length and having a slot with inclined walls intersecting the threaded portion of the barrel midway of its length and in one side of the barrel, a tri-

angular-shaped key having teeth on the outer surface thereof and removably inserted in said slot and engaging the inclined walls, a threaded longitudinally-movable bolt for engaging said key and said internally-threaded barrel, the inner end of the bolt forcing the key outward and retaining the same in its outward position.

2. In an expansion-nut, a barrel, a longitudinally-threaded aperture therein, a slot midway of the length of the barrel and having an inclined wall, a triangular-shaped key loosely mounted in said slot and engaging said inclined wall, a threaded bolt for moving said key outward.

3. In an expansion-nut, a barrel having an internally-threaded opening therethrough, a longitudinal slot having two inclined walls and facing each other in opposite directions, said slot opening into said threaded opening, a key substantially of a wedge shape located in said slot, one angle or apex of said key engaging one inclined wall of said slot, and another angle or apex of said key engaging the other inclined wall of said slot when in normal position whereby the key is prevented from dropping into the barrel, and whereby the rear wall serves to lock the key to the barrel, when extended.

4. In an expansion-nut, a barrel, a threaded aperture therethrough for a greater portion of its length, a slot intersecting the threaded aperture and having two inclined walls, a triangular wedge located in said slot and extending into the threaded aperture, two sides of the wedge engaging said inclined walls and one edge of said wedge having teeth oppositely located from the threaded part of the barrel, and teeth on the opposite side of said barrel, the teeth on said wedge and said barrel pointing in the same direction, and means engaging the threaded aperture for forcing said wedge outwardly.

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