

(No Model.)

I. CHURCH.
EXPANSION BOLT.

No. 527,406.

Patented Oct. 16, 1894.

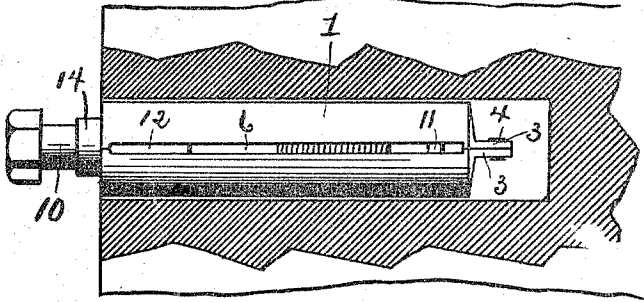


Fig. 1.

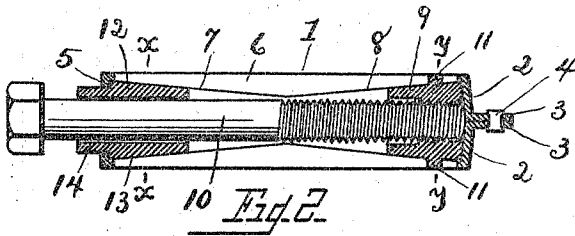


Fig. 2.

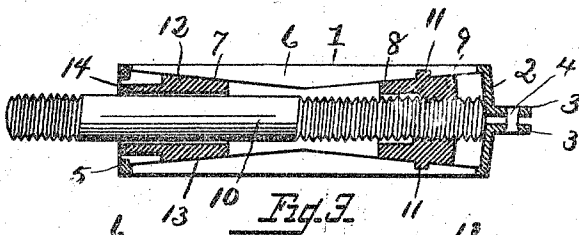


Fig. 3.



Fig. 4.

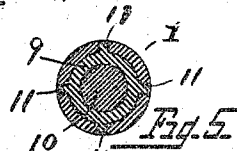


Fig. 5.

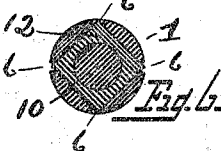


Fig. 6.

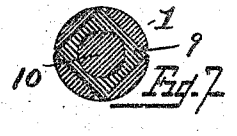


Fig. 7.

WITNESSES

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EXPANSION-BOLT.

SPECIFICATION forming part of Letters Patent No. 527,406, dated October 16, 1894.

Application filed December 1, 1893. Serial No. 492,438. (No model.)

To all whom it may concern:

Be it known that I, ISAAC CHURCH, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Expansion-Bolts; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form part of this specification.

My invention relates to an expansion bolt, and has for its object, to provide an expansible shell or casing having inclined sides upon which an inclined nut may be drawn to expand the same, with the base of the shell extending transversely across its diameter to serve as a contact point for the end of the bolt, to cause the nut to travel along the thread of the bolt as soon as the contact is effected.

A further object is to construct an expansible shell having inversely inclined interior sides, and means for expanding the shell at all points along its length.

A further object is to construct an expanding shell with an interior inclined surface, either round, rectangular, hexagonal, or polygonal in cross section to allow of using either round, winged expanding devices, or those of rectangular or other exterior formation.

The invention consists in the parts and combination of parts, hereinafter described and pointed out in the claims.

In the drawings: Figure 1 is a side view of the expansion bolt located within the perforation of an object in which it is to be secured, the object being in section to disclose the parts. Fig. 2 is a longitudinal transverse section of the shell and expanding devices, with the bolt in position. In these two views, the shell is shown prior to being expanded. Fig. 3 is a longitudinal transverse section of the shell and expanding devices, showing the shell expanded. Figs. 4 and 5 are cross sections on lines X X and Y Y, respectively of Fig. 2. Figs. 6 and 7 are cross sections respectively on the same lines of a modified form of construction.

1 designates the expansible shell, comprising two semi-circular sections in exterior cross section, each section having a transverse bot-

tom web 2, preferably formed with a right-angled flange 3 transversely perforated to receive a headed rivet 4 of greater length than the thickness of the two flanges, to allow the sections of shell to separate to the desired expansion. Each semi-circular section is preferably flanged at the upper end, thereby forming a concentric ring 5 upon the interior, and centrally of the circumference of each section there is a longitudinal slot 6, extending from the web to the flange, thereby dividing the shell into four expansible portions. The interior of the shell is inversely inclined, the outer portion 7 inclining from the center outwardly, and the lower portion 8, from the center inwardly or toward the inner end. Located within the inner end is an inversely inclined nut 9 threaded to receive the screw threaded end of a bolt or stub 10, and if the sections are circular internally in cross sections, as shown in Figs. 4 and 5, the nut is formed with radial wings 11, to enter slots 6, to prevent the nut from turning. The interior sides of the shell, however, may be flat, to form a rectangular central opening to receive a rectangular nut, as shown in Figs. 6 and 7, when the wings may be dispensed with.

In the operation of the device so far described the shell is inserted within the perforation formed in the object to which the bolt is to be attached, with the nut in its extreme inner position. The bolt is screwed through the nut, until the end contacts with the web, when upon further revolution of the bolt, the nut will travel up the inclined sides of the shell, and separate the sections to the desired expansion. This arrangement is of great value, as it obviates the necessity of providing a bearing for the head of the bolt in order to draw the nut within the shell, as it is often desirable to employ a stub bolt as shown in Fig. 3, and first secure the same in place before adding an object to be secured thereto.

In order to provide for a double grip of the shell within the perforation, there is provided an expander 12, which is located in the outer end of the shell and has an inverse inclination to that of the portion 7 of the shell, whereby when the expander is forced into the shell, an equal distance to the draw of the nut, there is an equal expansion, and consequently an equal grip along the entire length

of the shell. Expander 12 is preferably formed with the inclined body portion 13 centrally perforated to receive the bolt, and an annular outwardly projecting end portion 14, which, when the expander is withdrawn from the shell to its full extent, to allow the shell to contract to its smallest diameter, protrudes through the shell to serve as a means for forcing the expander into the shell.

The advantage of the invention will be apparent. First, it allows of expanding the lower end without first interposing a block or object between the head and shell; second, it allows of the use of a nut of any desired exterior formation; and, third, it provides for a double grip, or in other words, a grip of the shell alike at each end; and finally, it is simple in construction and inexpensive in manufacture.

What I claim is—

1. In an expansion bolt, a sectional shell having oppositely inclined inner face and a rigid transverse end web, means upon the web for securing the sections in assembled position, a nut in the shell, and means for moving the nut, and expanding the shell.

2. In an expansion bolt, a shell formed of two sections, each section having a rigid transverse web expansibly connected together, an

inclined interior surface upon the shell, an inversely inclined nut, and a bolt passing through the nut and contacting with the web.

3. In an expansion bolt, a shell having an oppositely inclined inner face, an end web at one end, and a concentric ring at the opposite end, a nut and an expander in the casing the expander being held from displacement by the concentric ring, and a bolt passing through said expander and screwed into the nut.

4. In an expansion bolt, a shell having an inversely inclined interior surface, a nut and an expander in the shell, the expander having a manual application, and a bolt passing through the same and screwed into the nut, by which means the nut is moved.

5. In an expansion bolt, a shell having inclined interior faces, and polygonal sides expanders in the same of corresponding shape in cross section, and means for moving the expanders, and expanding the shell.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

ISAAC CHURCH.

Witnesses:

WILLIAM WEBSTER,
CARROLL J. WEBSTER.