

(No Model.)

I. CHURCH.
EXPANSION-BOLT.

No. 406,565.

Patented July 9, 1889.

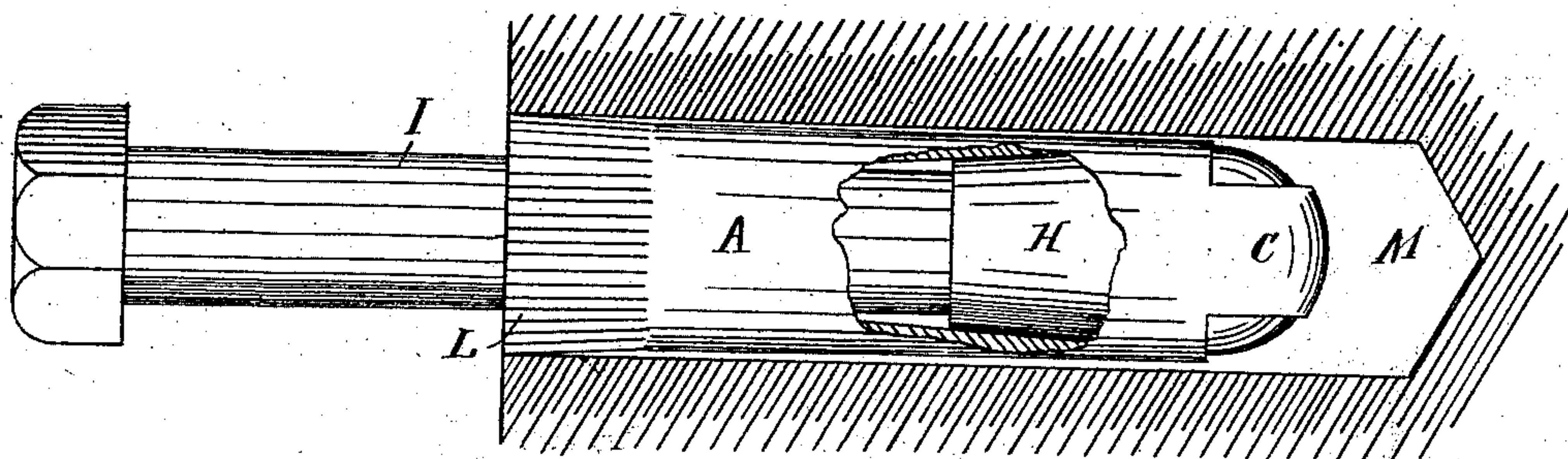


Fig. 1.

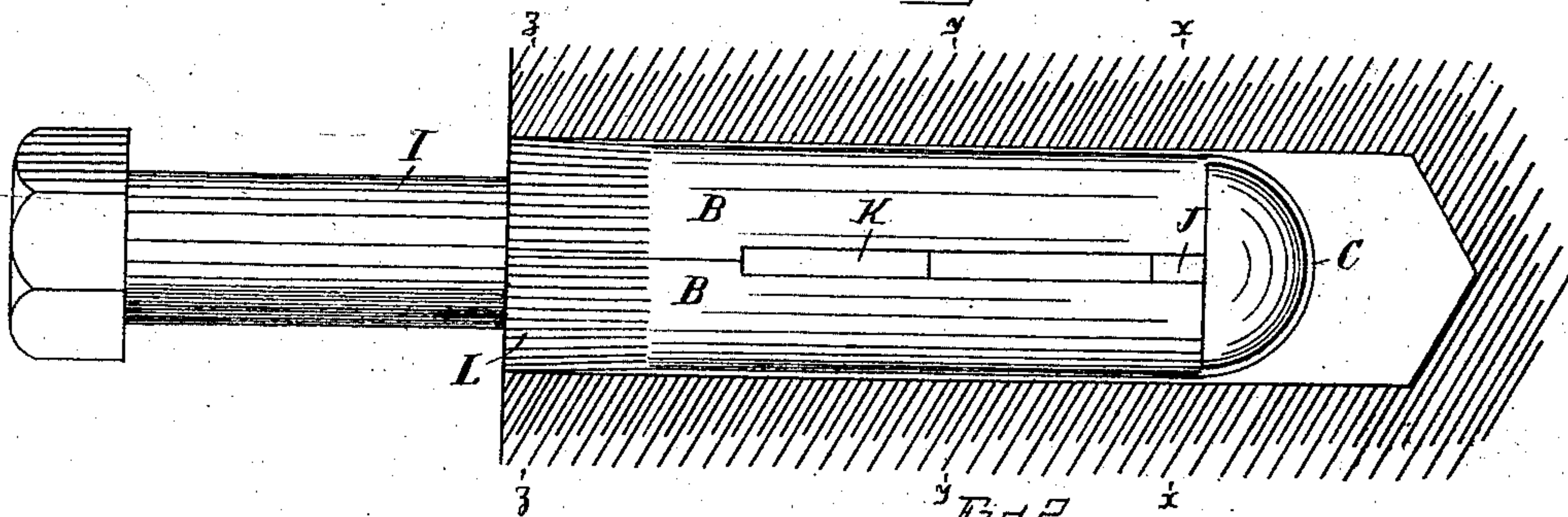


Fig. 2.

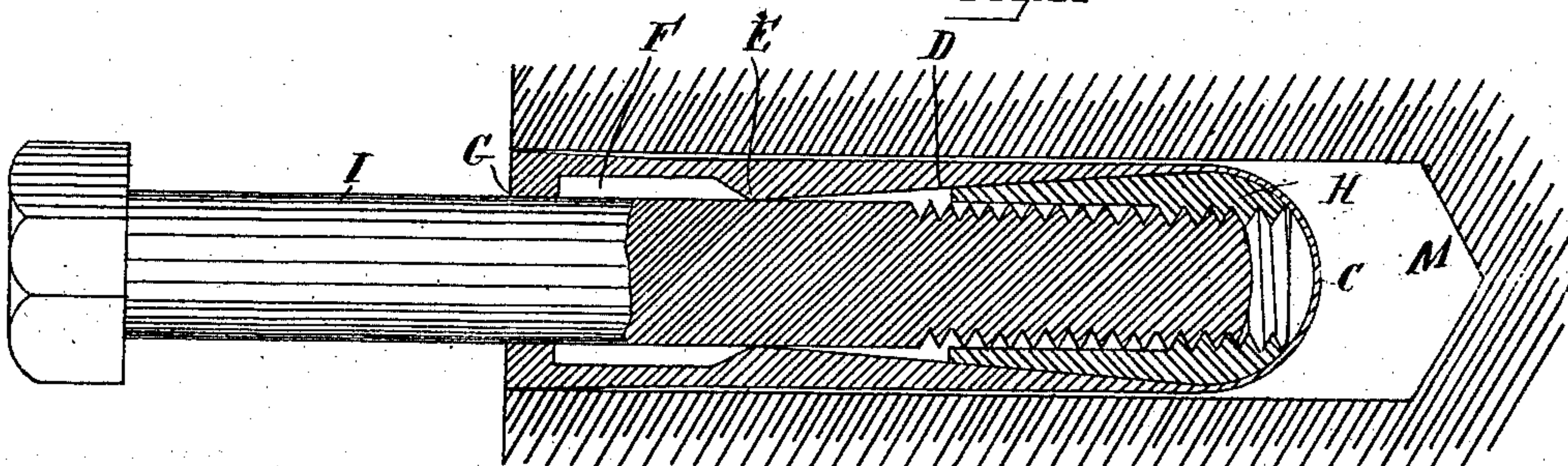


Fig. 3.

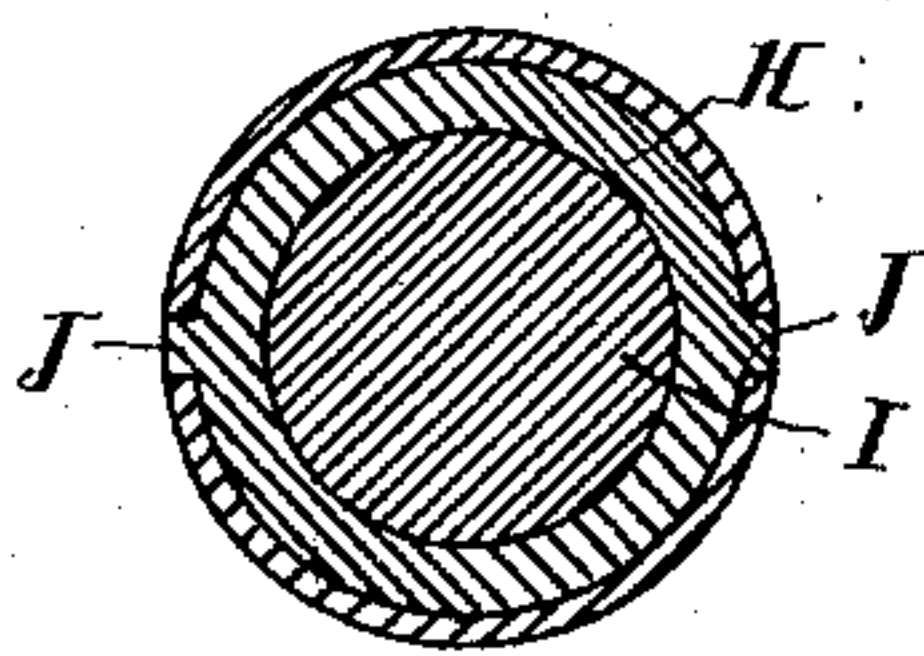


Fig. 4.

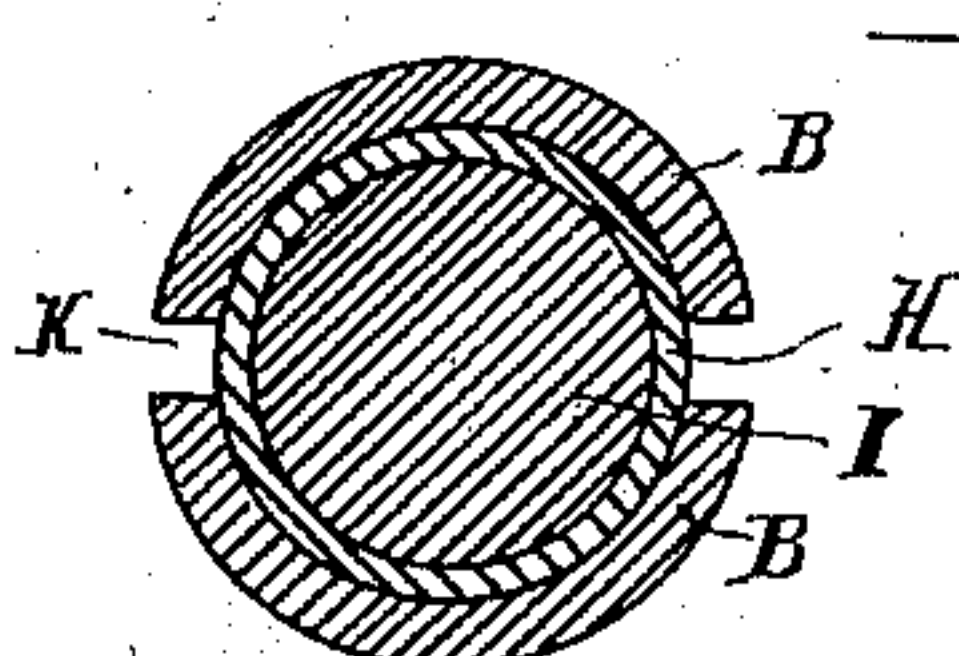


Fig. 5.

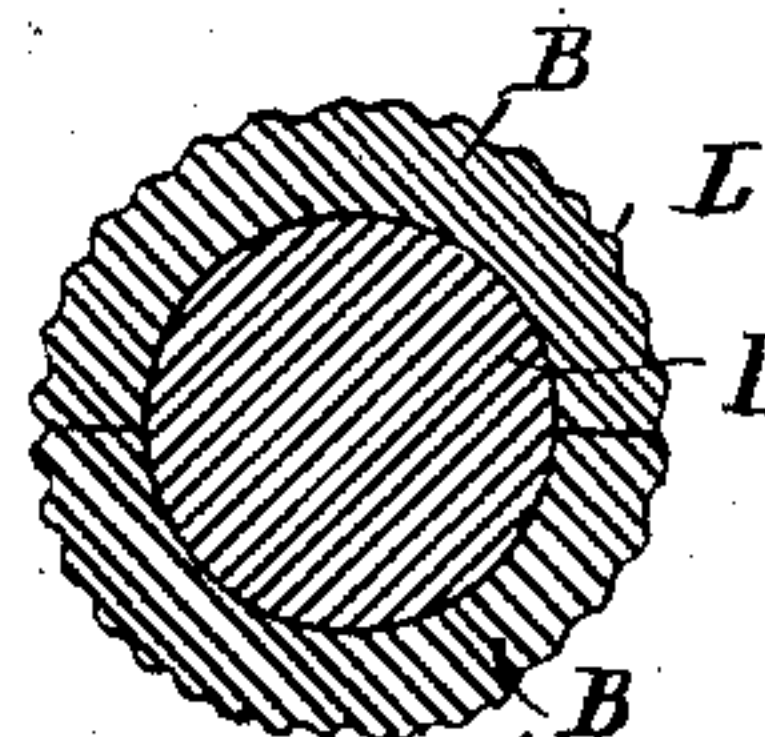


Fig. 6.

WITNESSES

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UNITED STATES PATENT OFFICE.

ISAAC CHURCH, OF TOLEDO, OHIO.

EXPANSION-BOLT.

SPECIFICATION forming part of Letters Patent No. 406,565, dated July 9, 1889.

Application filed April 22, 1883. Serial No. 308,170. (No model.)

To all whom it may concern:

Be it known that I, ISAAC CHURCH, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have
5 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
10 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to expansion-bolts of
15 the character employed in attaching iron or wood to stone or brick work.

The object of the invention is to provide an outer shell that can be expanded within a hole or opening formed in the stone or wall, by
20 means of a tapered threaded nut, when a bolt is screwed therein to secure a timber or like article in place.

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

In the drawings, Figure 1 is a side view of my expansion-bolt in position within a perforation, a part of the clamping-shell being broken away to disclose the position of the
30 nut. Fig. 2 is a like view showing the clamping-shell upon the side at which the two sections meet in parallel relation. Fig. 3 is a longitudinal vertical section through the bolt, nut, and shell. Figs. 4, 5, and 6 are transverse views on lines *x x*, *y y*, and *z z*, respectively, of Fig. 2.

A designates an expansion-shell, preferably formed of malleable cast-iron, although it may be forged from wrought-iron or steel, or
40 formed of brass, if desired. Shell A is formed with two semi-cylindrical end portions or sections B, connected together by a flexible central portion C, the shell being opened when first constructed, with the end portions B extending from the central portion in opposite
45 directions. The central portion C is then bent to cause the two end portions to lie one upon the other, thereby forming a cylindrical shell, as shown. Each half-section of the shell
50 is formed with a semicircular incline D, extending from the flexible portion C toward the end of the section, the incline terminat-

ing at E in a diameter corresponding to the diameter of the bolt to be inserted. From the termination of the incline at E there are preferably semicircular recesses F, extending to
55 near the end, where there is formed a semicircular opening G, corresponding to the diameter of the incline at E. By the construction described it will be seen that where the
60 two sections are assembled there is an annular inclined portion and two circular bearings or guides for the bolt to be passed through.

H designates a cone-shaped nut placed within the inclined annular portion of the
65 shell, with the inclination of the same in inverse order to that of the shell. The interior of the nut is screw-threaded for a portion of its length to receive a screw-threaded bolt I. Nut H is formed with two diametrically-op-
70 posite lugs or guides J, which move in slots K, cut from the sides of the sections B, as shown in Figs. 2, 4, and 5. The end portion of the exterior of the shell is milled or corrugated at
75 L, for the purpose of engaging with the interior surface of the perforation or recesses M in the stone or wall.

From the above description the operation will be readily understood. To attach a
80 hanger, whether of timber or iron, to a stone or wall, recess M is first formed; the shell is then contracted sufficiently to enter the same, nut H having been placed in position therein, when the spring inherent in the central portion C will cause the milled end of the shell to
85 bear against the sides of the recess to prevent the shell from turning therein. Bolt I is now passed through a perforation in the hanger, and the free end screwed into nut H, when, upon the bolt being screwed sufficiently tight
90 against the hanger to draw the same against the stone or wall, the nut is drawn forward against the incline, thereby expanding the shell and holding the parts firmly in place.

By the construction described the device
95 can be constructed with little expense. The nut may be formed solid, thereby maintaining at all times a circumferential hold upon the thread, whereby the full power and strength are exercised without danger of in-
100 jury to the thread of the bolt and allowing a removal of the bolt without disarranging the expansible feature of the device.

What I claim is—

1. In an expansion-bolt, a shell formed with an interior inclined annular portion and a cylindrical tapered nut within the same, in combination with a threaded bolt within the 5 nut, as and for the purpose set forth.

2. In an expansion-bolt, a cylindrical internally-inclined shell formed of two sections joined by a flexible portion intermediate the same, in combination with an inclined 10 nut movable upon the incline of the shell, as and for the purpose set forth.

3. In an expansion-bolt, a cylindrical shell formed of a plurality of sections connected by a flexible central portion, each of the sections being formed with an inclined interior 15 surface and a segment of an annulus, in combination with an oppositely-tapered nut movable upon the incline of the sections, and

a bolt movable within the annulus formed by the assembling of the segments, as and for 20 the purpose set forth.

4. In an expansion-bolt, semicircular sections formed with an internally-inclined interior portion, and slots extending from the same to the outer edge, in combination with 25 an inclined nut between the sections formed with projections to move within the slots, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses. 30

ISAAC CHURCH.

Witnesses:

WILLIAM WEBSTER.

CARROLL J. WEBSTER.