No. 691,921. Patented Jan. 28, 1902.

S. WHEELER.

EXPANSION BOLT.

(Application filed Mar. 30, 1901.)

(No Model.)

Fig. 1,

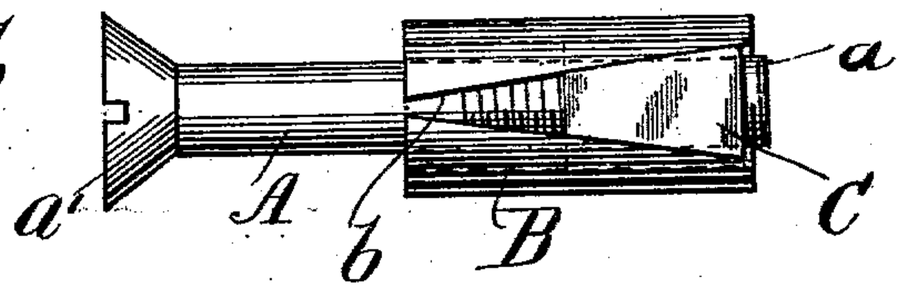


Fig. 2,

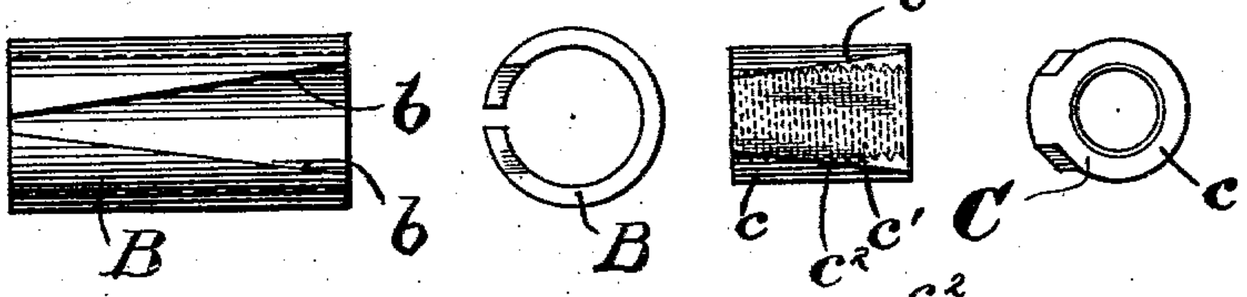


Fig. 3,

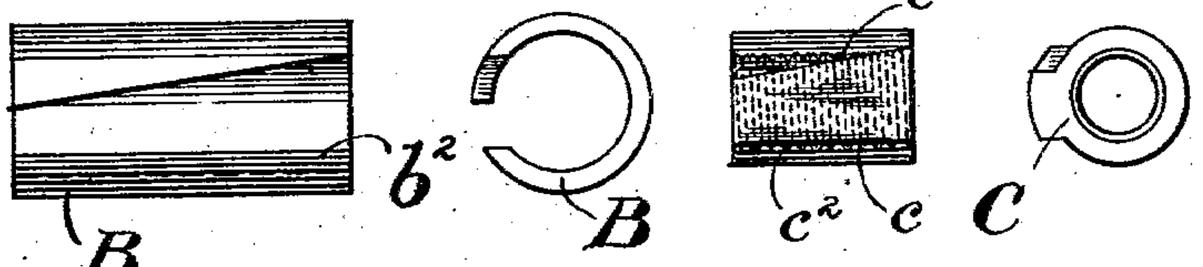


Fig. 4,

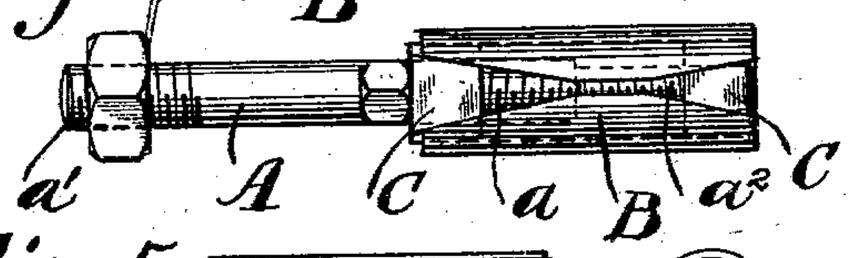


Fig. 5,

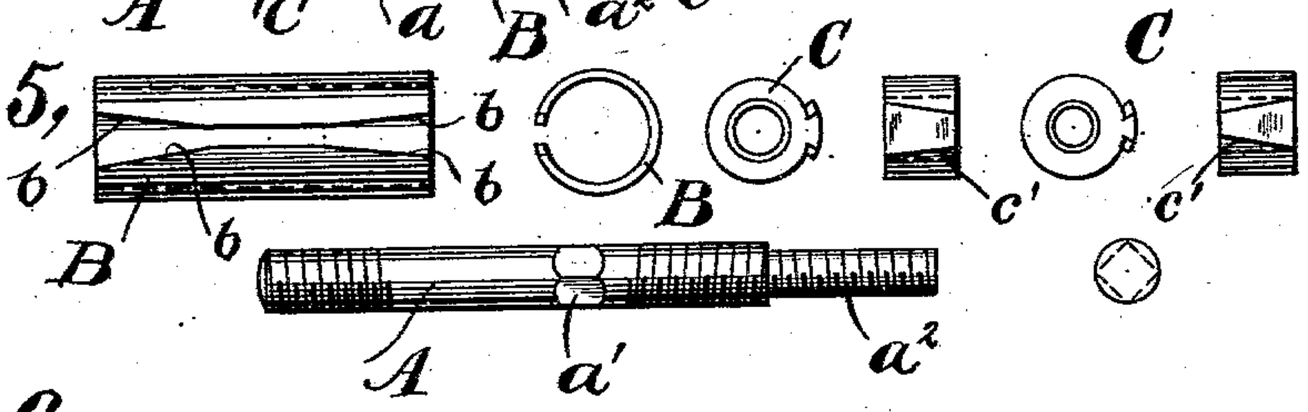
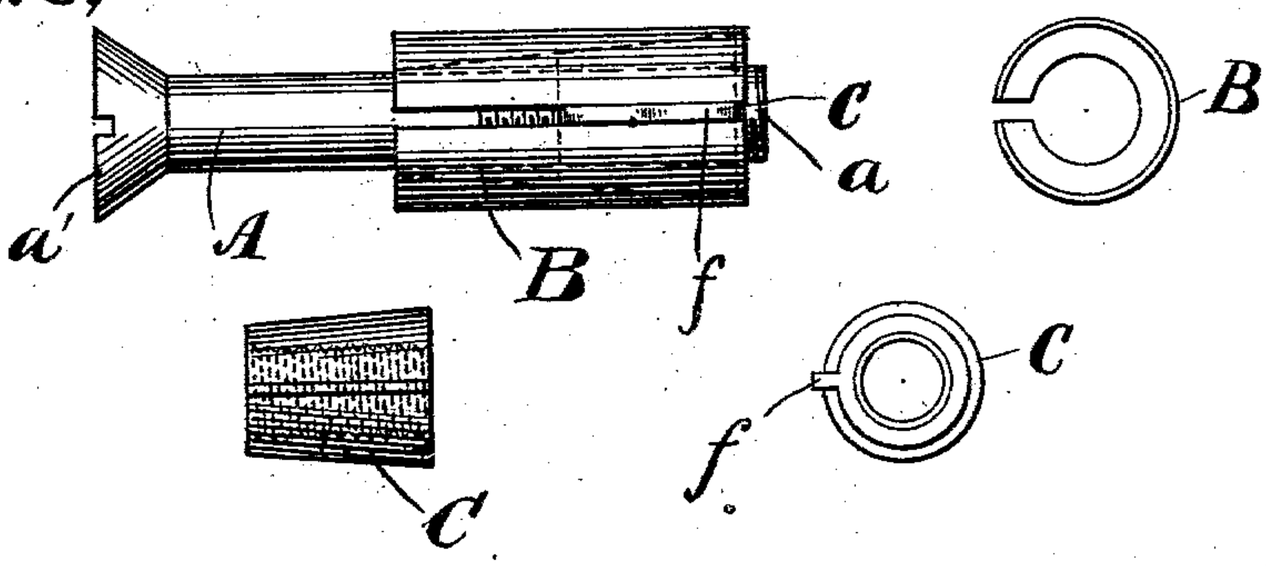


Fig. 6,



WITNESSES:

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INVENTOR

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UNITED STATES PATENT OFFICE.

SETH WHEELER, OF ALBANY, NEW YORK.

EXPANSION-BOLT.

SPECIFICATION forming part of Letters Patent No. 691,921, dated January 28, 1902.

Application filed March 30, 1901. Serial No. 53,693. (No model.)

To all whom it may concern:

Be it known that I, SETH WHEELER, a citizen of the United States of America, and a resident of Albany, in the county of Albany, State of New York, have invented certain new and useful Improvements in Expansion-Bolts, of which the following is a specification.

My invention relates to bolts, and particularly to that class of bolts known as "expansion-bolts."

The object of my invention is to provide a simple form of expansion-bolt in which the sleeve or member to be expanded may be made or formed of a single integral piece and will substantially fit or engage the orifice in which the said member is arranged to engage throughout its entire length and which is provided with an expansible device, whereby the said sleeve or expansible member may be expanded concentrically and substantially uniformly throughout its length, such expanding device being contained wholly within the said sleeve.

To this end my invention consists in certain details of construction and combination of parts, as will hereinafter be more fully set forth.

I will describe a bolt embodying my invention and then point out the novel features thereof in claims.

In the accompanying drawings, Figure 1 is a view of a bolt embodying my invention. Fig. 2 is a view showing the different parts comprised in the bolt of Fig. 1 detached or separated. Fig. 3 is a view showing a modified form of sleeve and expander, the two parts being separated or detached. Fig. 4 is a view of a further modification. Fig. 5 is a view of the several parts of the bolt of Fig. 4, they being detached or separated. Fig. 6 is a view of a further modification and of several of the parts detached.

Similar letters of reference designate corresponding parts in all of the figures.

A represents a bolt, B a sleeve which surrounds the bolt and which is to be expanded to fit the opening in which the bolt is inserted, and C the expanding device for the sleeve. The bolt A may be of any construction. It preferably comprises a screw-threaded portion a, on which the expanding device C works, and facets a' or a head, by means of which the bolt is turned.

The sleeve B is a split one—that is, it is provided with a longitudinal cut extending from one end to the other of the sleeve. The edges b of this cut may taper or be inclined relatively to the longitudinal axis of the sleeve from one end of the sleeve B to the other, as shown in Figs. 1 and 2, or one edge b^2 may be straight, with the other inclined, as shown in Fig. 3.

The expanding device C consists of a collar c, interiorly screw-threaded, and a wedge c', carried by the collar c. The wedge c' engages with the edges of the longitudinal cut of the sleeve B. In Figs. 1 and 2 the edges c^2 of the wedge c are both inclined to conform to the taper or inclination of the edges b' of the sleeve B, while in Fig. 3 one edge of the wedge is straight to conform to the straight edge b^2.

Referring now to Figs. 4 and 5, the bolt A is shown as having two screw-threaded portions, the additional or second threaded portion being indicated by a^2. The two screw-threaded portions are opposite—that is, one is a right thread and the other a left thread. On each threaded portion a and a^2 an expanding device C works. The sleeve B in this instance is also provided with a longitudinal cut extending from end to end, the edges of which are oppositely tapered. Instead of having both edges taper, as shown, the form of cut illustrated in Fig. 3 may be provided at each end. In either case the wedges c' of the two expanding devices will be formed to coact with the edges of the longitudinal cut.

The operation of the device will be readily understood. The bolt is first inserted through the object to be secured in position and then into the sleeve and expanding device. The bolt, with the sleeve and expanding device, is then inserted into the opening in which the bolt is to be secured. The bolt is then rotated, and because the sleeve is prevented from moving longitudinally by its bearing against the object to be secured in place it is expanded by the action of the bolt and expanding device. It will be seen that by reason of the longitudinal cut extending from end to end of the sleeve the sleeve will be expanded concentrically,

the effect of which is to bind it more securely to the wall of the opening or cavity. There is also less liability in a concentric expansion of fracturing the edge of the opening when the opening is formed in brittle or porous substances.

In Fig. 6 the longitudinal opening in the sleeve is straight instead of tapered. The sleeve is formed with a conical inner surface, and the expanding device is conical in form to fit the inner surface of the sleeve and has a rib *f*, which runs in the slot of the sleeve and prevents the expanding device from turning. In this form the expanding device acts upon the inner surface of the sleeve instead of upon the edge of the slot to expand it concentrically when the bolt is rotated.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a bolt, of a sleeve formed in one piece and having a single longitudinal cut from end to end through the wall thereof, said sleeve surrounding said bolt; together with an expanding device contained wholly within the said sleeve, and coacting with same to produce a concentric expansion, substantially uniform throughout the length thereof.

2. The combination with a bolt, of a sleeve formed in one piece and having a single longitudinal cut from end to end through the wall thereof, said sleeve surrounding said bolt; together with an expanding device engaging the longitudinal edges of the cut in the sleeve, for expanding the sleeve concentrically, and substantially uniformly, throughout its length.

3. The combination with a bolt, of a sleeve formed in one piece and having a single longitudinal cut from end to end through the wall thereof, an edge of said cut being inclined relatively to the longitudinal axis of the sleeve, said sleeve surrounding said bolt; together with an expanding device working on the bolt and engaged with said inclined edge, whereby the sleeve is expanded concentrically, and substantially uniformly, throughout its length.

4. The combination of a bolt having oppositely-threaded portions, a split sleeve surrounding the bolt and split from end to end, and having a plurality of inclined portions in the longitudinal edges of the sleeve, and a pair of expanding devices working on said screw-threaded portions of the bolt and engaging with said inclined portions, whereby the bolt is expanded concentrically.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SETH WHEELER.

Witnesses:
C. F. CARRINGTON,
EDW. B. HAWKINS.