

No. 694,345.

Patented Mar. 4, 1902.

D. W. BENNETT.  
EXPANSION BOLT.

(Application filed Aug. 27, 1901.)

(No Model.)

Fig. 1.

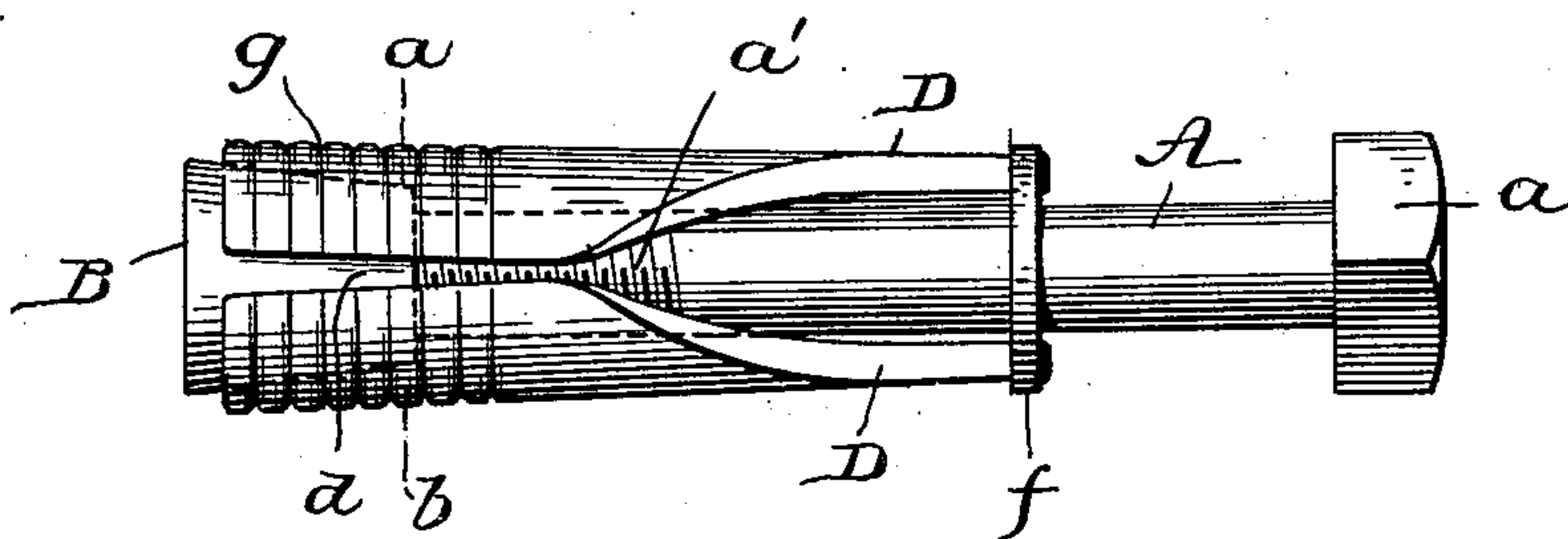


Fig. 2.

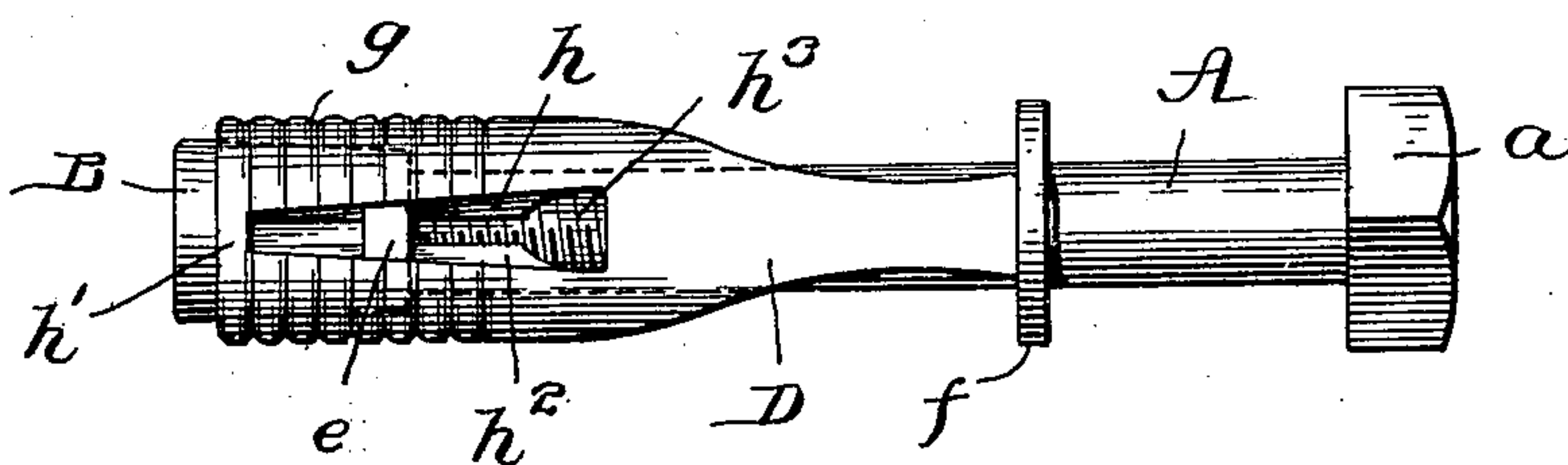


Fig. 3.

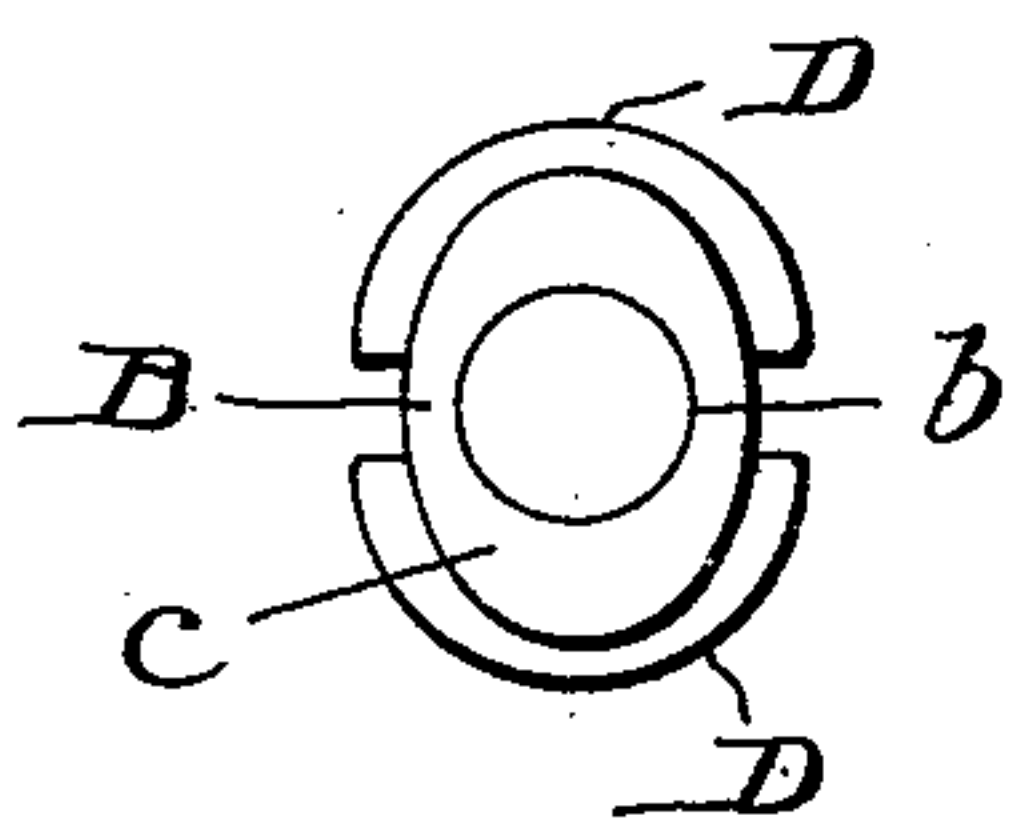


Fig. 5.

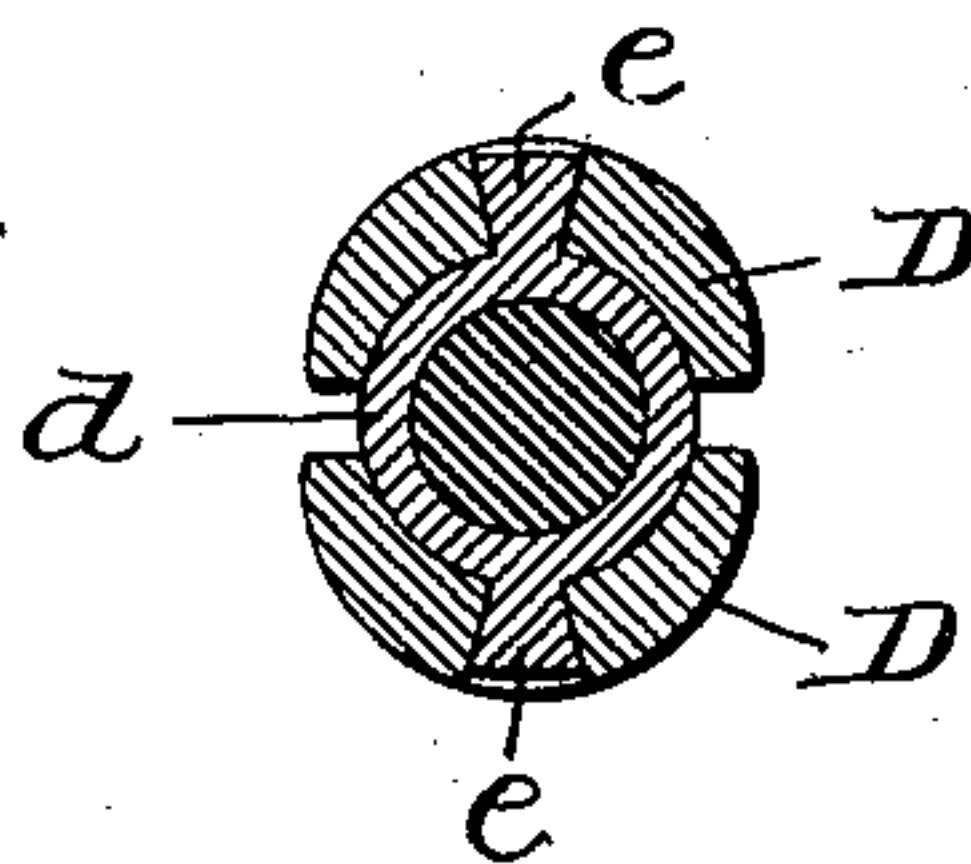


Fig. 7.

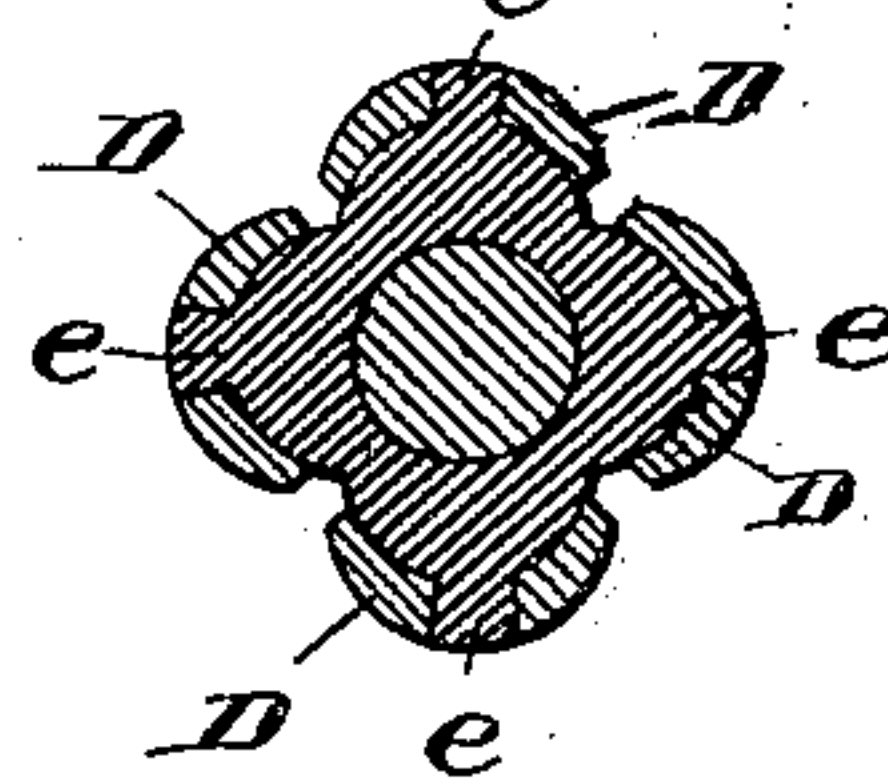


Fig. 4.

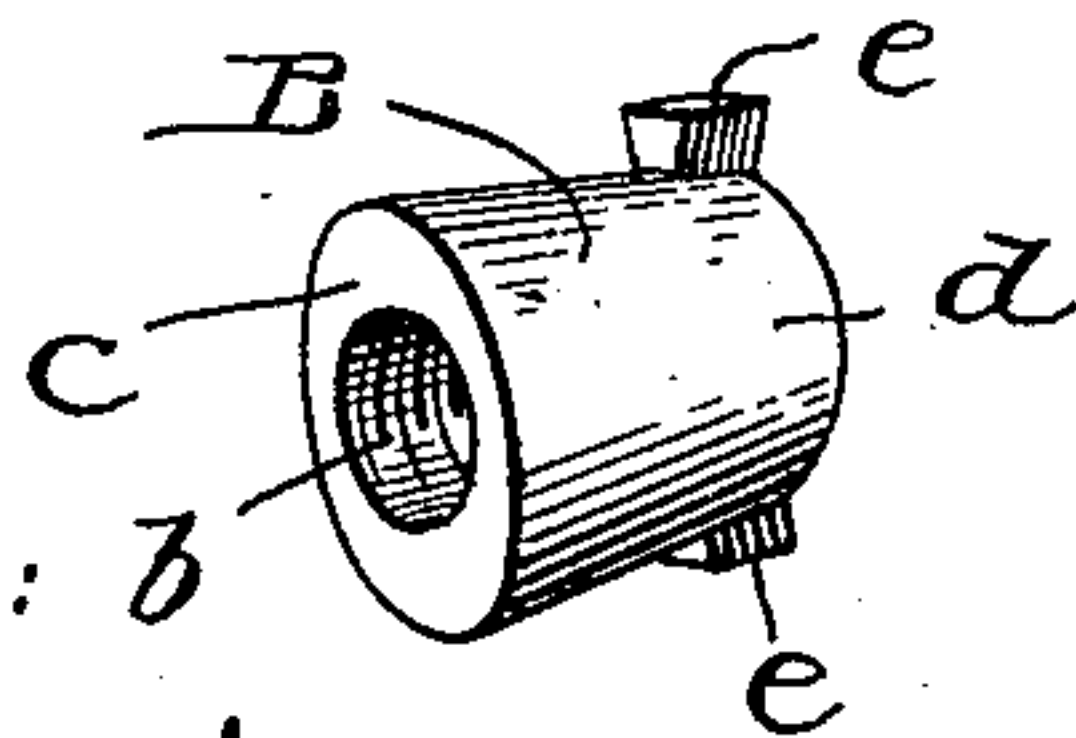
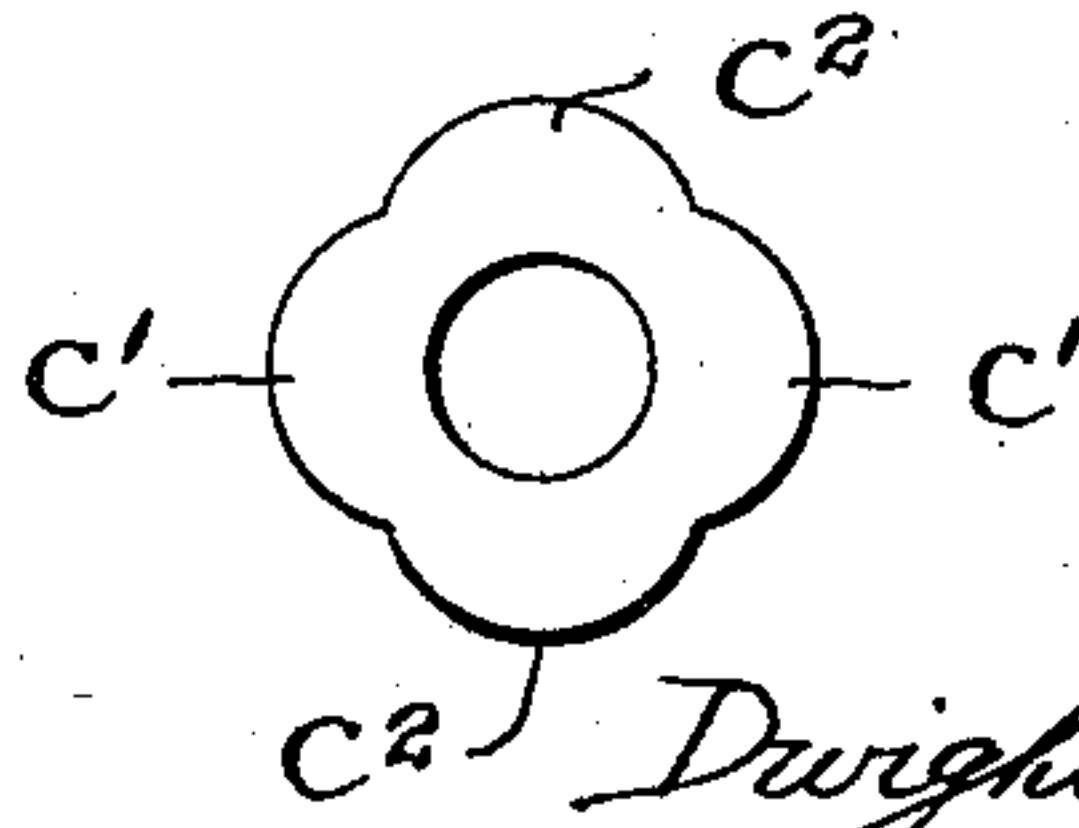


Fig. 6.



WITNESSES:

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## EXPANSION-BOLT.

SPECIFICATION forming part of Letters Patent No. 694,345, dated March 4, 1902.

Application filed August 27, 1901. Serial No. 73,480. (No model.)

*To all whom it may concern:*

Be it known that I, DWIGHT W. BENNETT, a citizen of the United States, residing at the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Expansion-Bolts, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to expansion-bolts of the general character described in Letters Patent granted to me May 14, 1901, No. 674,074; and it consists of certain improvements of the device therein described, my present invention having for its object, first, to prevent a turning of the nut-head in the spring-sleeve, and, second, the more secure holding together of the nut-head and spring-sleeve.

To these ends my invention consists in the combination, with a spring-sleeve of the character described, having segmental spring wings or sections united at their bases to a collar, of a retaining head or nut of oval form relatively to two opposite segmental spring-sections of the sleeve and with means to form a sliding connection between the nut and spring-sleeve; also, in a spring-sleeve of the character described provided with longitudinal beveled slots closed at the outer end of the sleeve-section and terminating at the inner end thereof in a wider but plain slot or recess, in combination with a retaining nut or head provided with longitudinal beveled flanges adapted to slide in the longitudinal beveled slots of the spring-sleeve and form a dovetailed sliding connection between said parts.

In the drawings illustrating my invention, Figure 1 is a side elevation in the plane of movement of the spring-sleeve sections. Fig. 2 is a side elevation in the plane of movement of the nut-head flanges within the slots of the spring-sleeve sections. Fig. 3 is a front end view of Fig. 1; Fig. 4, an elevation in perspective of the nut-head. Fig. 5 is a section on the line *a b* of Fig. 1; and Fig. 6, a front end view of a modified form of the nut-head, being a double-oval nut-head; and Fig. 7 is a cross-section of the same and of the four-

section spring-sleeve required for such modified form of nut-head.

A screw-threaded bolt A, with a driving-head *a*, constructed as usual, is employed. The screw-threaded portion *a'* of this bolt registers with an internally-screw-threaded opening *b* in the retaining nut-head B. This nut-head B tapers in cross-sectional area from its outer face *c* to its inner end *d*. It is substantially cylindrical at its inner end *d*, widening outwardly in diameter until about midway of its length it assumes a flattened shape, terminating at its outer end *c* in an oval shape, as shown in Figs. 3 and 4. It is provided exteriorly and near its inner end with longitudinal flanges *e*, (see Fig. 4,) which are beveled inwardly. A modification of this oval-ended nut-head is shown in Fig. 6. The opposite segments *c'* *c'* form one oval and the other opposite segments *c''* *c''* form another oval. These are arranged transversely—that is to say, crossing each other at right angles. In the use of such a double-oval form of the retaining-head the spring-sleeve is to be provided with four spring-sections.

The spring-sleeve, as shown in the two side views, Figs. 1 and 2, consists of a collar *f*, perforated centrally to allow the bolt A to pass freely through it. Mounted on said collar are one or more pairs of spring-sections *D D*, each single pair or each two pair, as the case may be, forming a spring-sleeve. As shown in the drawings, the sleeve has a single pair of such sections *D*. They may be ribbed exteriorly, as at *g*, if desired. Each section is rounded or given a concavity at and toward its free end from about the center of its length, so that in cross-section it is segmental in form, as shown at Fig. 3, and it is slotted longitudinally, as at *h*, (see Fig. 2,) the slot having a closed end, as at *h'*, and beveled inwardly, as at *h''*, to fit the beveled edge of the flange *e* on the retaining-nut, and said slot terminates at the inner end thereof in a wider plain opening or slot *h'''* for convenience in assembling the parts primarily. The beveled slot is to be made just wide enough to allow the flange *e* of the retaining nut-head to be held therein, while allowing it free longitudinal movement therein when



the bolt is adjusted in the wall, and hence the parts are retained together in proper relation by such dovetail sliding connection. I have found from experience with the bolt of my patent above referred to that the flange of the head-nut is apt to slip out of the slot in the spring-sleeve when the bolt is withdrawn from the wall, and the head-nut will be frequently left in the wall. An important feature of my present invention is in making the slot beveled inwardly and making the flange a like bevel to correspond, so that we have a dovetail sliding connection of said parts, and when assembled they cannot be separated on a withdrawal of the bolt from the wall. The tendency of these spring-sleeve sections being to spread outward toward the extreme end and give their widest separation from each other at the driven end of the bolt, they assume collectively an interior shape exactly coinciding at all times to and registering with the segments of the oval-ended retaining head or nut B, so that when said head B is drawn by its smaller end within the spring-sleeve it will press the sections of the latter outward at their far ends against a spring tension thereby created and give said spring-sleeve such a hold on the nut that it cannot possibly rotate in the sleeve, as formerly. These sleeve-sections are not less than two in number, but may be in two pairs, formed of two oppositely-disposed spring-sections, as shown in the drawings.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, forming an expansion-bolt, of a spring-sleeve, formed of two oppositely-disposed segmental spring-sections, concave interiorly and united at the base to a perforated ring or collar, a screw-threaded bolt passing through the collar, and a retaining head or nut having a central screw-threaded opening and of exterior contour oval in cross-section at its outer end and tapering toward its inner end; with means to guide said nut in a longitudinal sliding movement in the sleeve-sections, substantially as described.

2. The combination, forming an expansion-bolt, of a spring-sleeve having two transversely-arranged pairs of spring-sections which are concaved interiorly and united at

the base to a perforated ring or collar, a screw-threaded bolt passing through the collar, and a retaining-head having a central screw-threaded opening and of exterior contour presenting on cross-section at its outer end two transversely-arranged ovals constituting two pairs of oppositely-disposed segments, said segments being adapted to coincide with the interior concave faces of the four sleeve-sections, said retaining-head tapering substantially to a cylinder at its inner end; with devices between the spring-sections and retaining-head adapted to form a sliding connection between them; substantially as described.

3. In combination, forming an expansion-bolt, a spring-sleeve, having a series of concave spring-sections slotted longitudinally, with a bevel slot as at  $h$  terminating in a larger plain slot as at  $h^3$ , a perforated collar supporting the sections at one end, a screw-threaded bolt passing through the collar, and a retaining-nut provided with a series of longitudinally-arranged beveled flanges adapted to enter the beveled slots in the spring-sections and form a dovetail sliding connection therewith; substantially as described.

4. In combination, forming an expansion-bolt, a spring-sleeve, having a series of concave spring-sections slotted longitudinally, with a bevel slot as at  $h$  terminating in a larger plain slot as at  $h^3$ , a perforated collar supporting the sections at one end, a screw-threaded bolt passing through the collar, and a retaining-nut having a central screw-threaded opening and of exterior contour presenting in cross-section two oppositely-disposed segments at its outer end and tapering toward the inner end, and provided with a series of longitudinally-arranged beveled flanges adapted to enter the beveled slots in the spring-sections and form a dovetail sliding connection therewith; substantially as described.

In testimony whereof I have hereunto affixed my signature this 21st day of August, A. D. 1901.

DWIGHT W. BENNETT.

Witnesses:

ANDREW V. GROUPE,  
H. T. FENTON.