

No. 702,067.

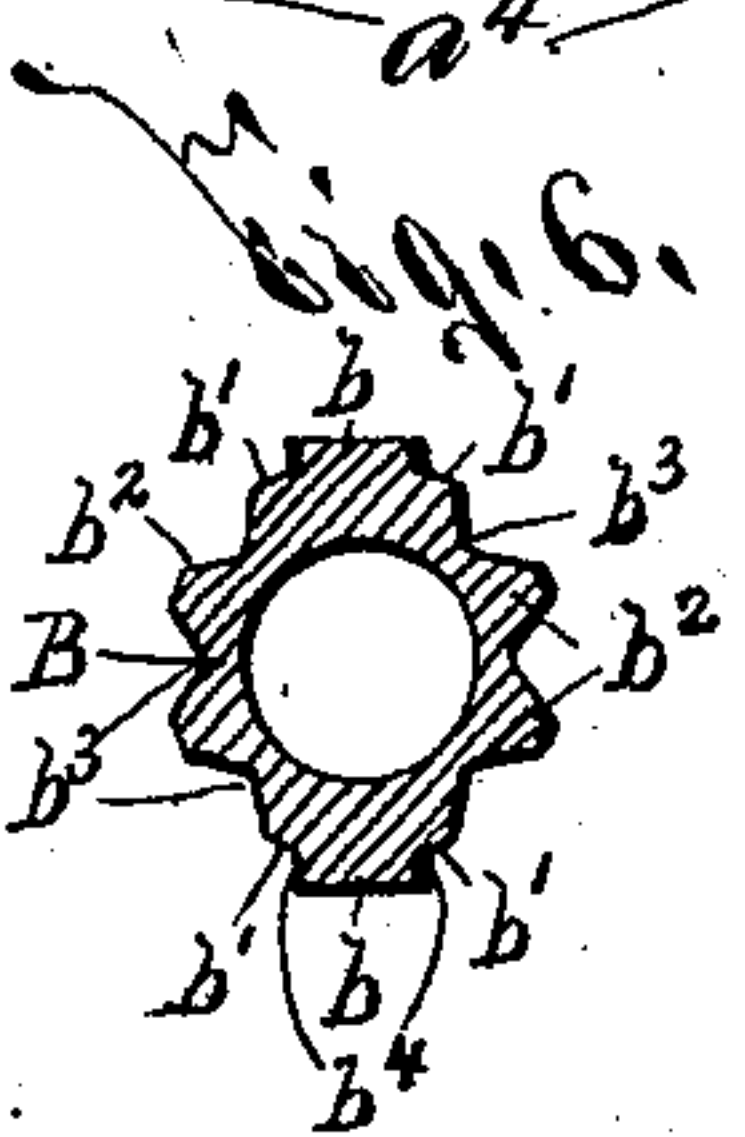
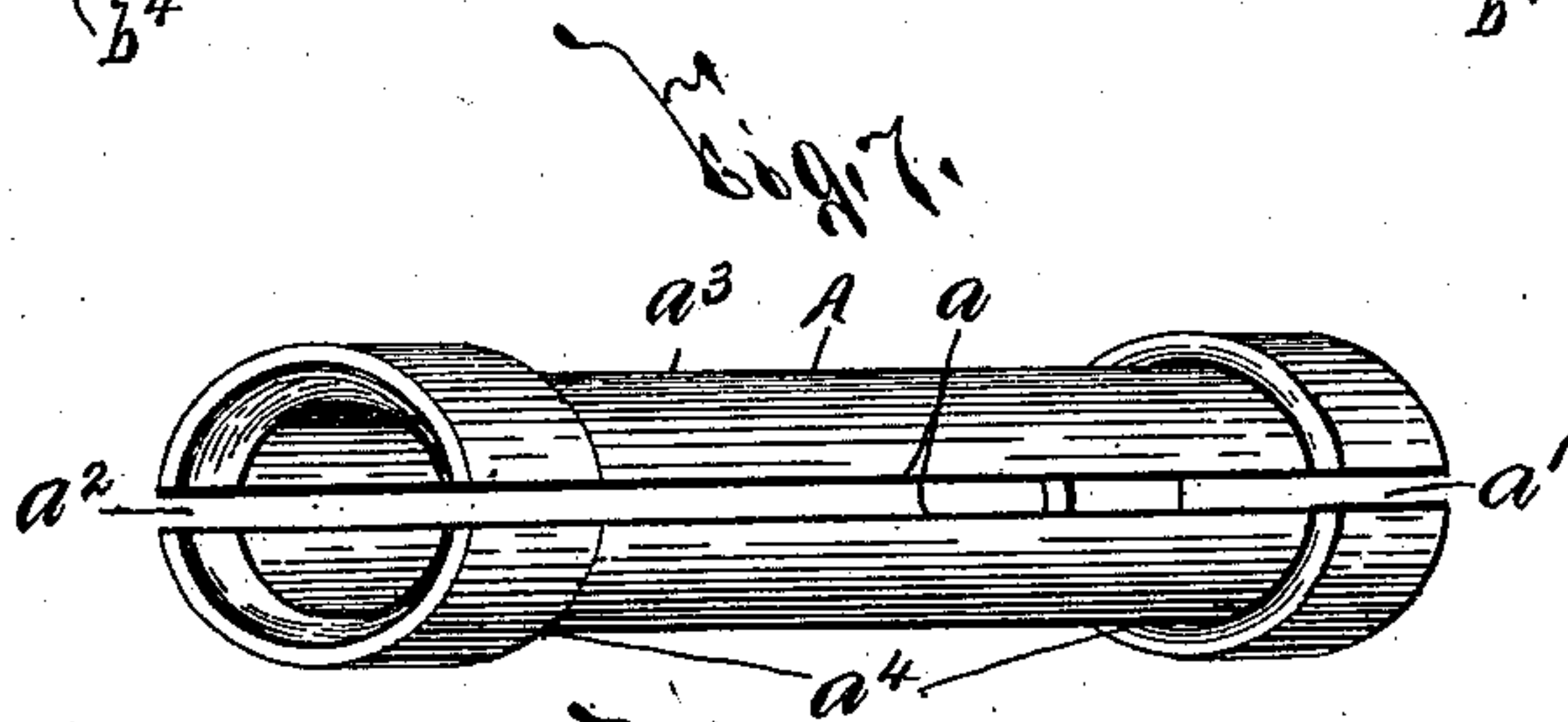
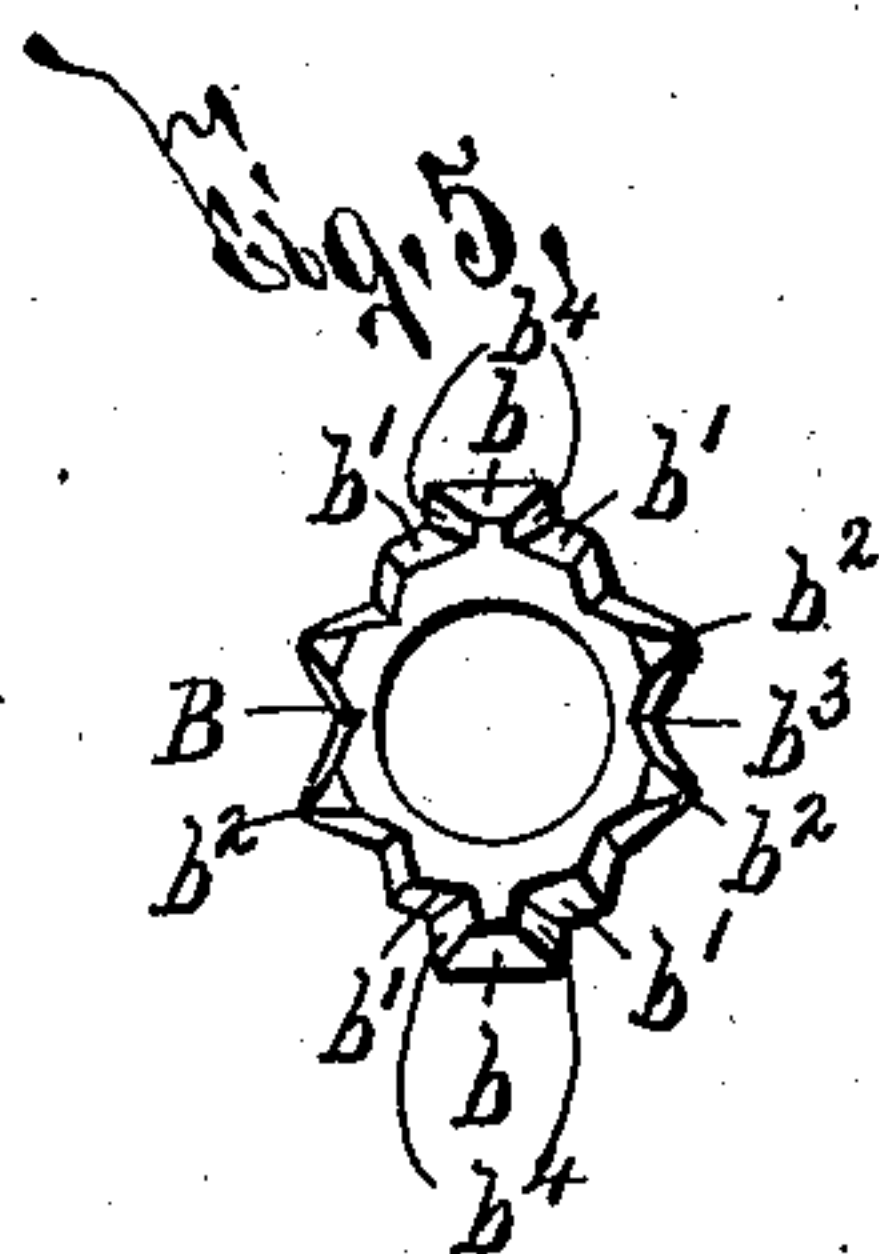
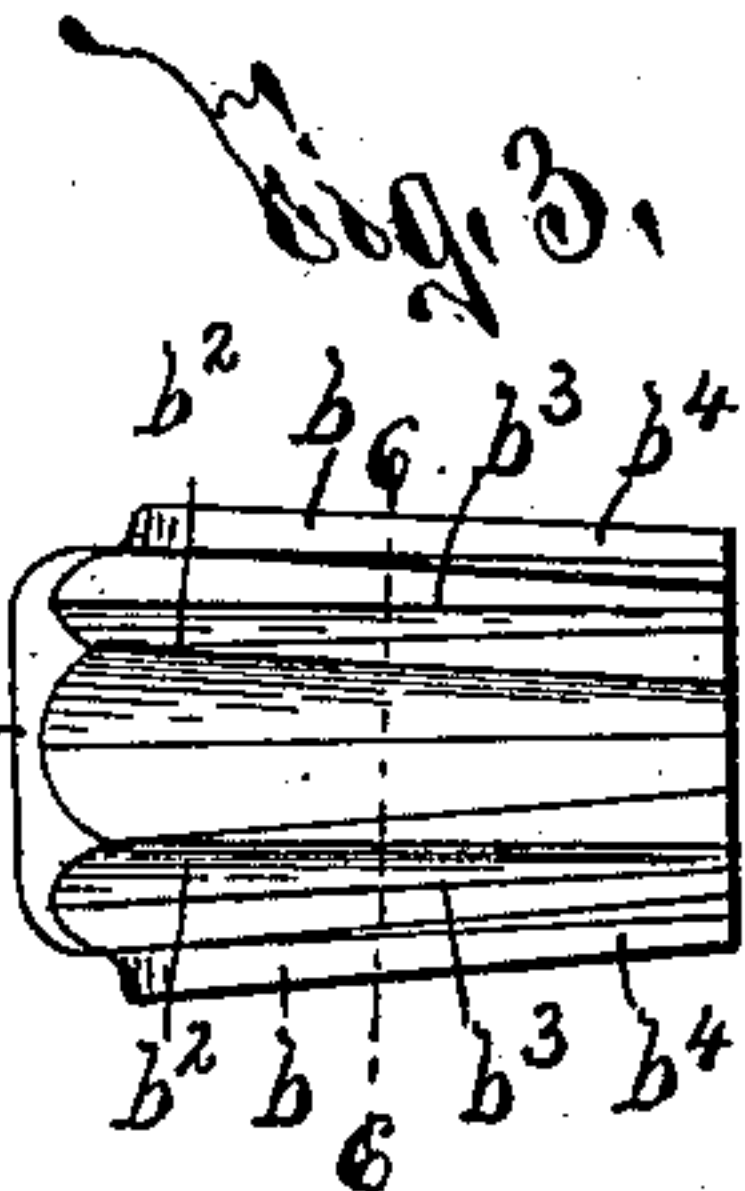
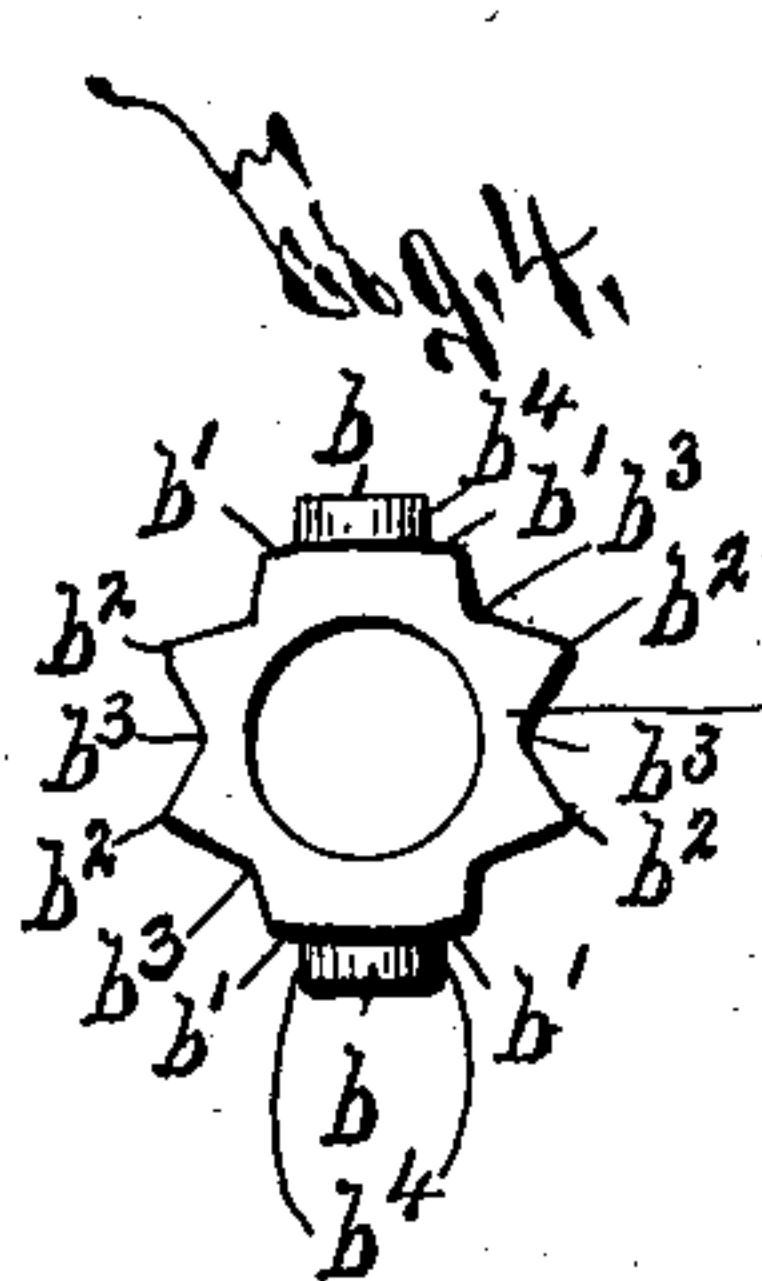
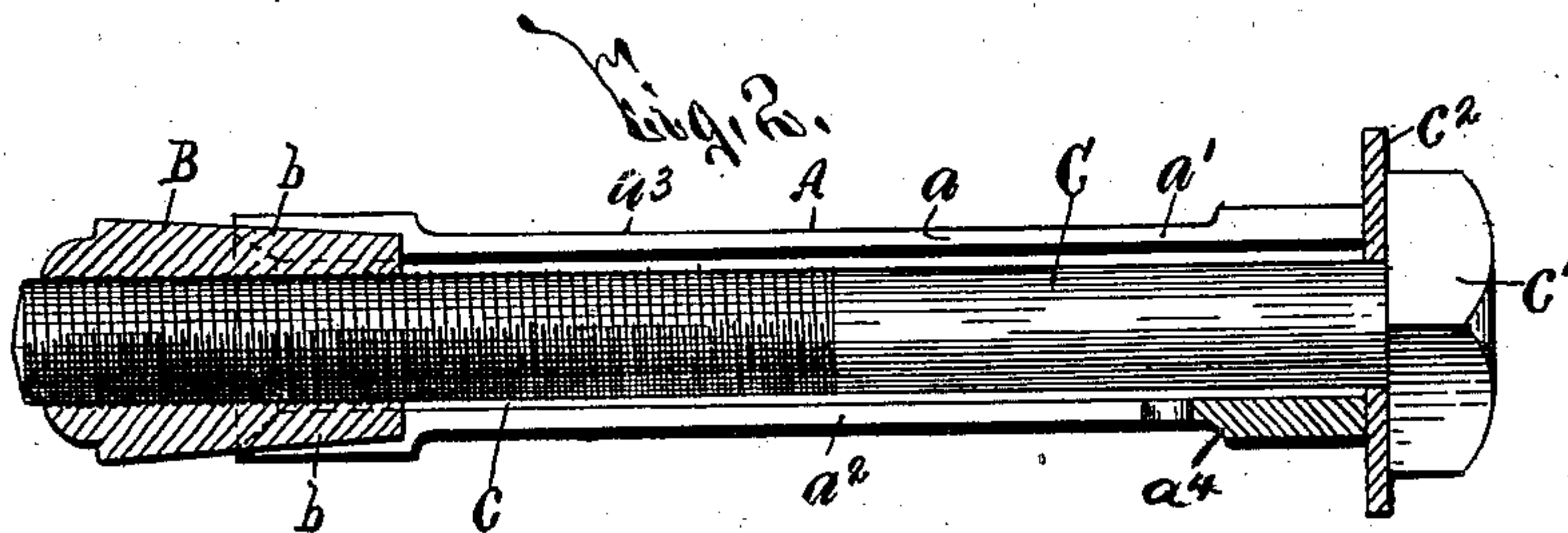
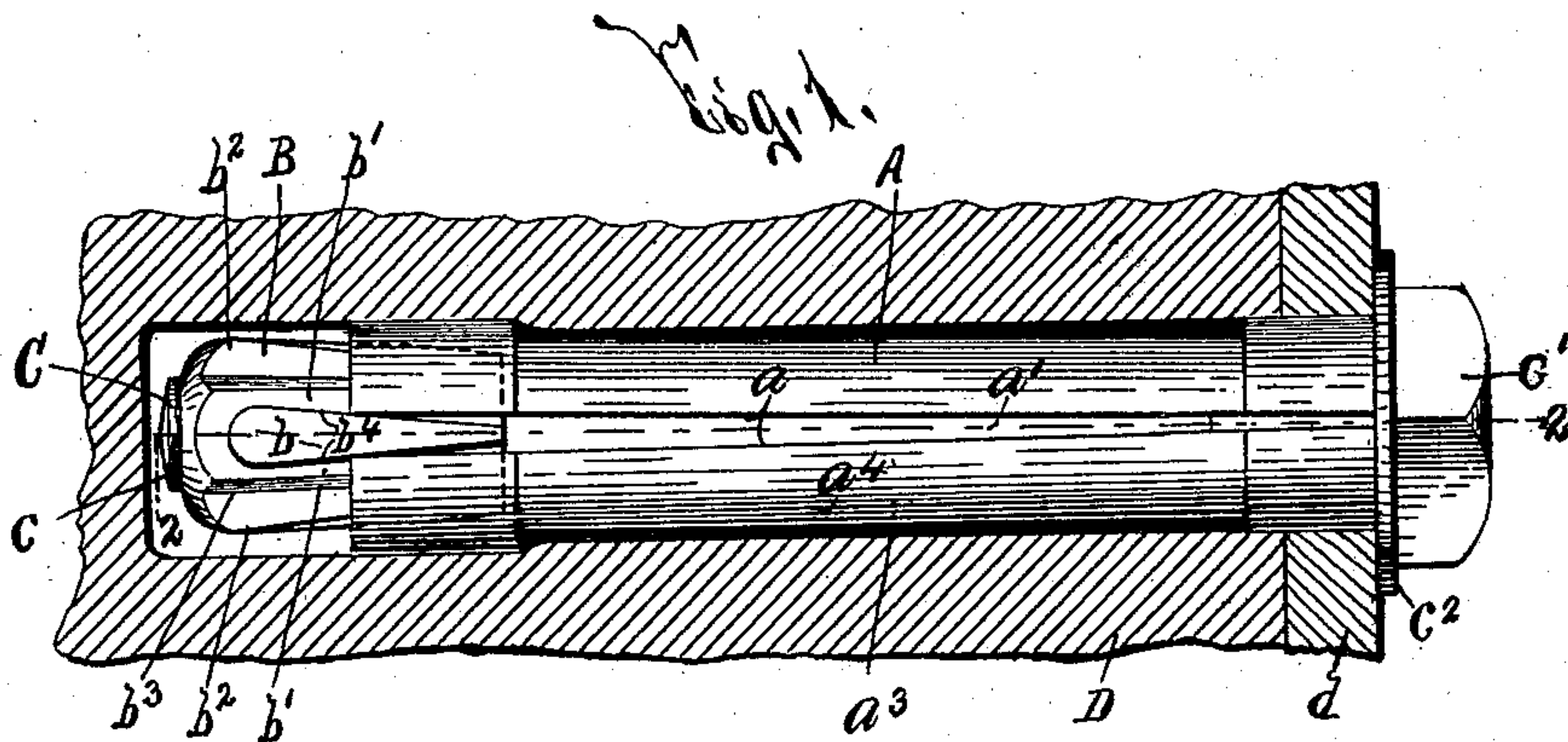
Patented June 10, 1902.

E. J. McCORMICK.
EXPANSION FASTENER.

(Application filed Mar. 31, 1898. Renewed Apr. 10, 1902.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
H. C. Chase,
M. D. Lewis

INVENTOR
Edwin J. McCormick,
BY
Ray & Parsons,
ATTORNEYS.

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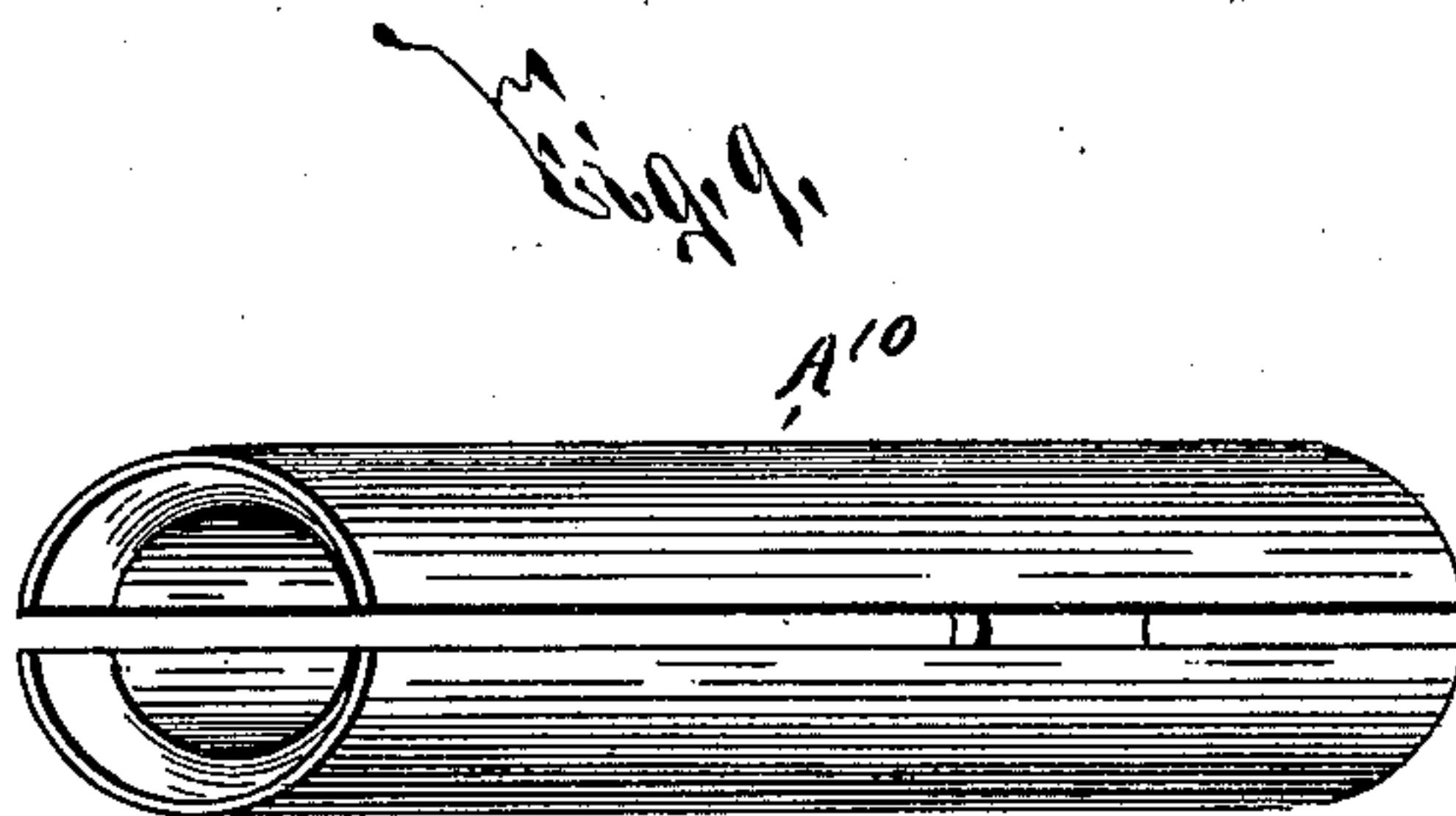
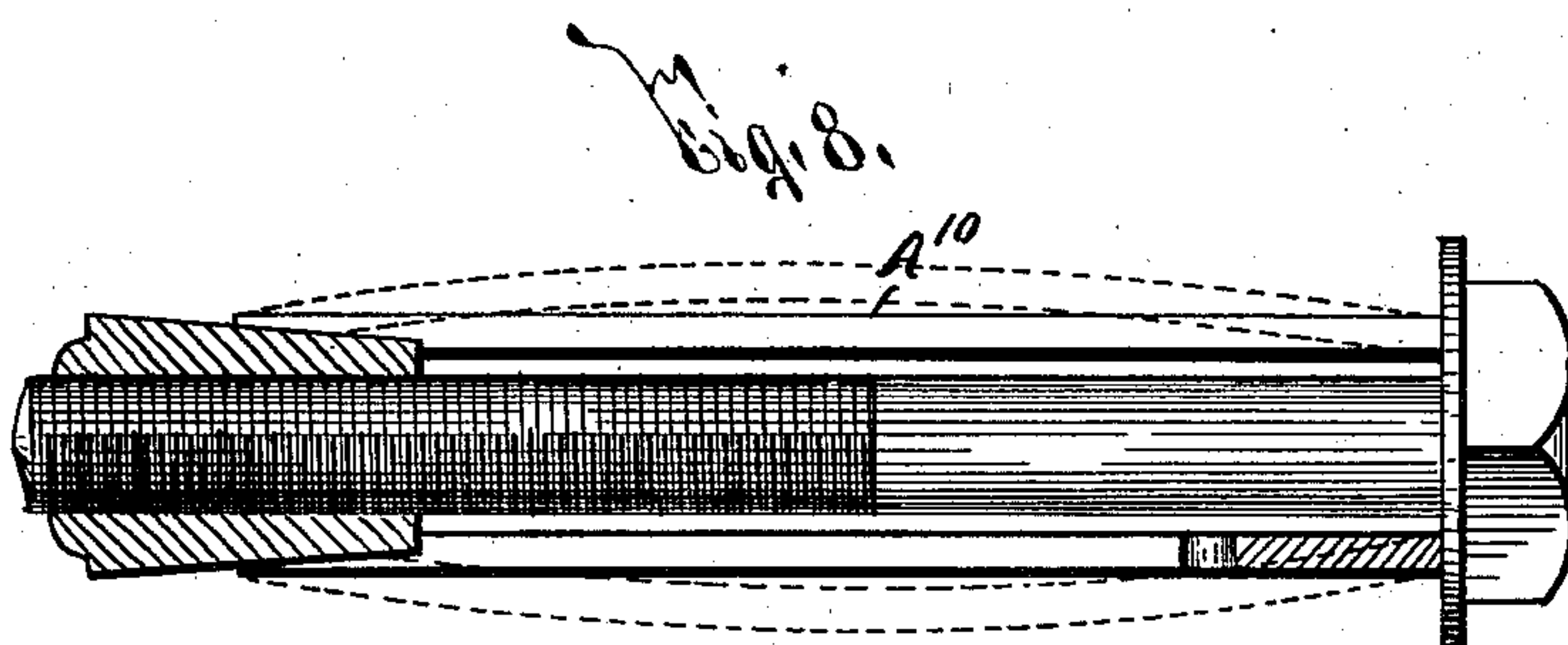
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(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWIN J. McCORMICK, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE
McCORMICK MANUFACTURING COMPANY, OF NEW YORK, N. Y.,
A CORPORATION OF WEST VIRGINIA.

EXPANSION-FASTENER.

SPECIFICATION forming part of Letters Patent No. 702,067, dated June 10, 1902.

Application filed March 31, 1898. Renewed April 10, 1902. Serial No. 102,334. (No model.)

To all whom it may concern:

Be it known that I, EDWIN J. McCORMICK, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Expansion-Fasteners, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention has for its object the production of an expansion-fastener which is particularly economical in manufacture and practical and effective in use; and to this end it consists in the combination, construction, and arrangement of the component parts of an expansion-fastener, as hereinafter fully described, and pointed out in the claims.

In describing this invention reference is had to the accompanying drawings, forming part of this specification, in which like letters indicate corresponding parts in all the views.

Figure 1 is an elevation of my improved fastener shown as operatively engaged with a portion of a support and the contiguous part of a plate to be secured to the support. Fig. 2 is a longitudinal sectional view, partly in elevation, taken on line 2 2, Fig. 1. Figs. 3, 4, and 5 are respectively side and end elevations of the detached nut of my improved expansion-fastener. Fig. 6 is a transverse section of said nut, taken on line 6 6, Fig. 3. Fig. 7 is an isometric view of the detached sleeve of the fastener. Fig. 8 is a longitudinal section, partly in elevation, of a modified construction of my improved expansion-fastener. Fig. 9 is an isometric view of the detached sleeve of said modified construction of fastener.

My improved expansion-fastener preferably consists of a sleeve A, a nut B, and a threaded shank C.

The sleeve A is usually composed of a sheet-metal blank, having its side edges a slightly separated for forming a narrow lengthwise slot a' in one side of the sleeve. The opposite side of the sleeve A is generally formed with a narrow lengthwise slot a^2 , which extends from one end face of the sleeve to a point in close proximity to its opposite end face. The intermediate portion a^3 of the expansion-sleeve A is usually more yielding than con-

tiguous portions thereof, being preferably formed thinner than the opposite ends of said sleeve by an annular groove a^4 in its periphery. A sleeve of the described construction is economical in manufacture, as it is cheaply and quickly formed by suitable stamping and bending machinery from a strip of rolled sheet metal having one face provided with a lengthwise groove. Said sleeve is also particularly practical and effective, since its yielding or thin central portion reduces its weight and permits endwise compression of the sleeve, being especially liable to buckle outwardly within the opening or socket in which my improved fastener is inserted, and thus additionally prevent the withdrawal of the fastener. It is obvious, however, that the sleeves of my improved fastener may be formed of uniform thickness from end to end, as clearly illustrated in Figs. 8 and 9, in which figures A¹⁰ represents a sleeve of such construction.

The nut B is preferably substantially conical and is movable within the inner or rear end of the sleeve A, with its periphery engaged with the inner face of the sleeve for expanding said sleeve within the opening or socket into which it is inserted. Said expanding-nut is generally provided with oppositely-arranged longitudinal ribs or fins b , engaging surfaces b' , additional ribs b^2 , and grooves b^3 . The ribs or fins b are movable in the slots $a' a^2$ of the sleeve A, and their opposite sides b^4 incline forwardly toward each other and are arranged substantially parallel with each other in cross-section, being extended outwardly from the periphery of the nut B in substantially parallel planes, as best illustrated in Fig. 6. The engaging surfaces b' extend laterally from the bases of the tapering ribs b beyond the side walls of the slots $a' a^2$, incline forwardly toward each other, and form the opposite sides of longitudinal faces arranged substantially concentric with the inner face of the sleeve A and normally engaged with said face. The ribs b^2 are interposed between the ribs b and usually increase in width toward their forward ends, their opposite sides being inclined rearwardly toward each other. The outer faces of said

ribs b^2 engage the inner face of the sleeve A and facilitate the expansion of said sleeve. The grooves b^3 decrease forwardly in width and serve to lighten the weight of the nut B.

5 The shank C is of any desirable form, size, and construction and is here illustrated as provided at its opposite ends with threads c and a head c' , for respectively engaging the nut B, and a washer c^2 , engaged with the ad-
10 vance end face of the sleeve A.

In the practical use of my improved fastener it is inserted within openings or sockets formed in the articles which it is desired to secure together, as a support D and a plate
15 d . The head c' is then revolved by a suitable wrench, and the nut B is drawn toward said head, thus expanding the inner or rear end of the sleeve A and compressing the sleeve end-
20 mediate portion of the sleeve outwardly within said openings or sockets. When the sleeve A is sufficiently expanded, the parts D d are firmly and positively secured together.

The construction and operation of my im-
25 proved expansion-fastener will now be readily understood upon reference to the foregoing description and the accompanying drawings.

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

1. The combination of a sleeve consisting of a sheet-metal blank having its side edges separated for forming a lengthwise slot in the
35 sleeve, and a substantially conical nut movable within the sleeve and having its periphery engaged with the inner face of the sleeve and provided with a tapering rib movable in said slot, substantially as and for the pur-
40 pose described.

2. The combination of a sleeve having an intermediate portion formed more yielding than contiguous portions thereof, and means for compressing the sleeve endwise and buc-
45 kling outwardly said intermediate portion, substantially as and for the purpose set forth.

3. The combination of a sleeve having an intermediate portion formed of less thickness than its ends and having one of its ends mov-
50 able endwise toward the other for buckling outwardly said intermediate portion of the sleeve and an expanding-nut movable within said one of the ends of the sleeve; substan-
tially as and for the purpose described.

4. The combination of a sleeve consisting of a sheet-metal blank having its intermediate portion formed of less thickness than its ends and having its side edges separated for form-
55 ing a lengthwise slot in the sleeve, and a nut movable with the sleeve and provided with a tapering rib movable in said slot, substan-
60 tially as and for the purpose set forth.

5. The combination of a sleeve having a lengthwise slot, and a substantially conical
65 nut movable within the sleeve and having its periphery engaged with the inner face of the sleeve and provided with a longitudinal rib

movable in the slot of the sleeve, said rib having its opposite sides inclined forwardly toward each other, and having opposite por-
70 tions thereof extended outwardly from said periphery in substantially parallel planes, substantially as and for the purpose specified.

6. The combination of a sleeve having a lengthwise slot, and a substantially conical
75 nut movable within the sleeve and having its periphery engaged with the inner face of the sleeve and provided with a tapering rib projecting into the slot and with engaging sur-
80 faces extending laterally from the base of the rib beyond the side walls of the slot and engaged with the inner face of the sleeve, substantially as and for the purpose set forth.

7. The combination of a sleeve having a lengthwise slot, and a substantially conical
85 nut movable within the sleeve and having its periphery engaged with the inner face of the sleeve and provided with longitudinal ribs having their outer faces engaged with the
90 inner face of the sleeve, substantially as and for the purpose described.

8. The combination of a sleeve having a lengthwise slot, and a substantially conical
95 nut movable within the sleeve and having its periphery provided with longitudinal ribs increasing in width toward their forward ends and having their outer faces engaged
with the inner face of the sleeve, substan-
tially as and for the purpose specified.

9. The combination of a sleeve having a
100 lengthwise slot, and a substantially conical nut movable within the sleeve and having its periphery engaged with the under face of the sleeve, and provided with longitudinal
105 grooves decreasing in width toward their forward ends, substantially as and for the purpose set forth.

10. The combination of a sleeve having sep-
110 arated lengthwise slots, and a substantially conical nut movable within the sleeve and having its periphery provided with longitudi-
115 nal faces arranged substantially concentric with the inner face of the sleeve for engaging said inner face, and substantially longi-
tudinal ribs projecting from said faces into the slots of the sleeve and having their op-
posite sides engaged with the walls of said slots, substantially as and for the purpose described.

11. The combination of a sleeve having sep-
120 arated lengthwise slots, and a substantially conical nut movable within the sleeve and provided with separated longitudinal ribs projecting from its periphery and movable in the slots of the sleeve, said nut being also
125 provided with additional ribs interposed between the former ribs and having their outer faces engaged with the inner face of the sleeve, substantially as and for the purpose
130 specified.

12. The combination of a sleeve having sep-
arated lengthwise slots, and a substantially
conical nut movable within the sleeve and
provided with separated longitudinal ribs

projecting from its periphery into the slots of the sleeve and having their opposite sides inclined forwardly toward each other and opposite portions of said sides extended outwardly from the periphery of the nut in substantially parallel planes, said nut being also provided with additional ribs interposed between the former ribs for engaging the inner face of the sleeve and having their opposite sides inclined rearwardly toward each other, substantially as and for the purpose set forth.

13. The combination of a sleeve having separated lengthwise slots, and a substantially conical nut movable within the sleeve and provided with separated longitudinal ribs projecting from its periphery into the slots of the sleeve and having their opposite sides inclined forwardly toward each other and opposite portions of said sides extended outwardly from the periphery of the nut in substantially parallel planes, said nut being also provided with engaging surfaces extending laterally from the bases of the ribs and inclining forwardly toward each other, substantially as and for the purpose described.

14. As a new article of manufacture, the herein-described expansion-sleeve, the same being composed of a sheet-metal blank hav-

ing its side edges separated for forming a lengthwise slot in the sleeve, and having an intermediate portion formed of less thickness than its ends and having one of its ends movable endwise toward the other for buckling outwardly said intermediate portion of the sleeve, substantially as and for the purpose specified.

15. As a new article of manufacture, the herein-described nut for expansion-fasteners, the same being formed substantially conical and having its periphery provided with projecting longitudinal ribs the opposite sides of which incline forwardly toward each other, engaging surfaces extending laterally from the bases of the ribs and inclining forwardly toward each other, and additional ribs interposed between said engaging surfaces, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 24th day of March, 1898.

EDWIN J. McCORMICK.

Witnesses:

K. H. THEOBALD,
D. LAVINE.