

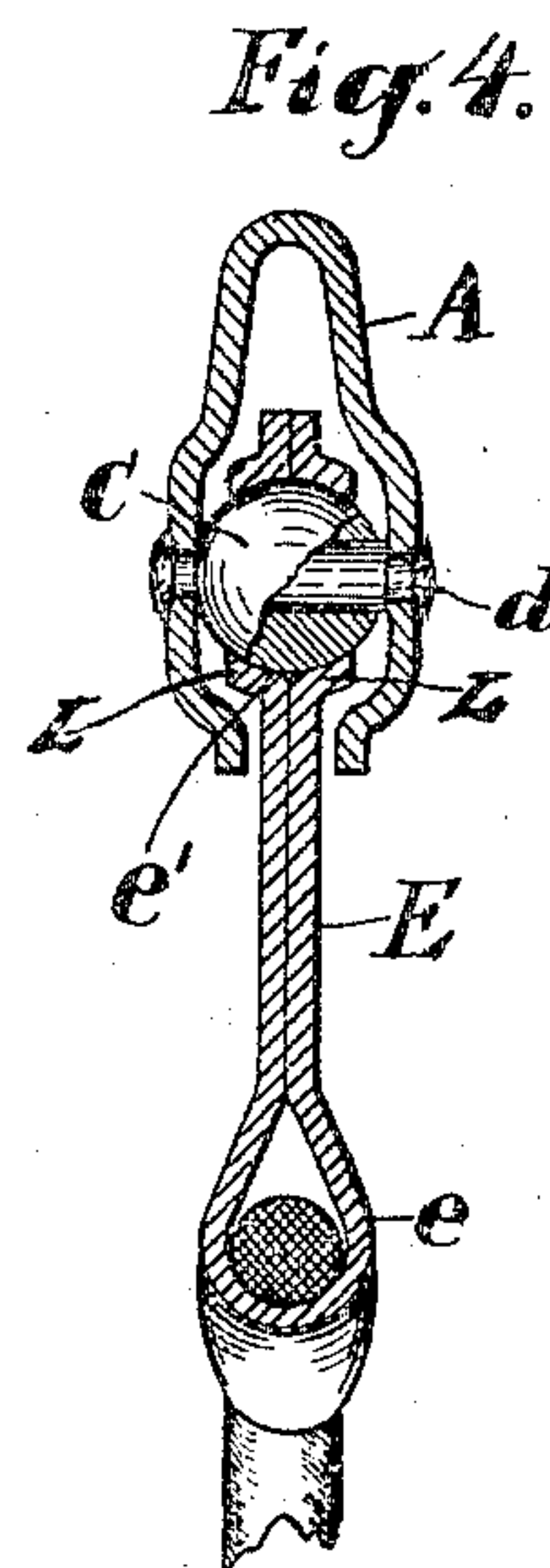
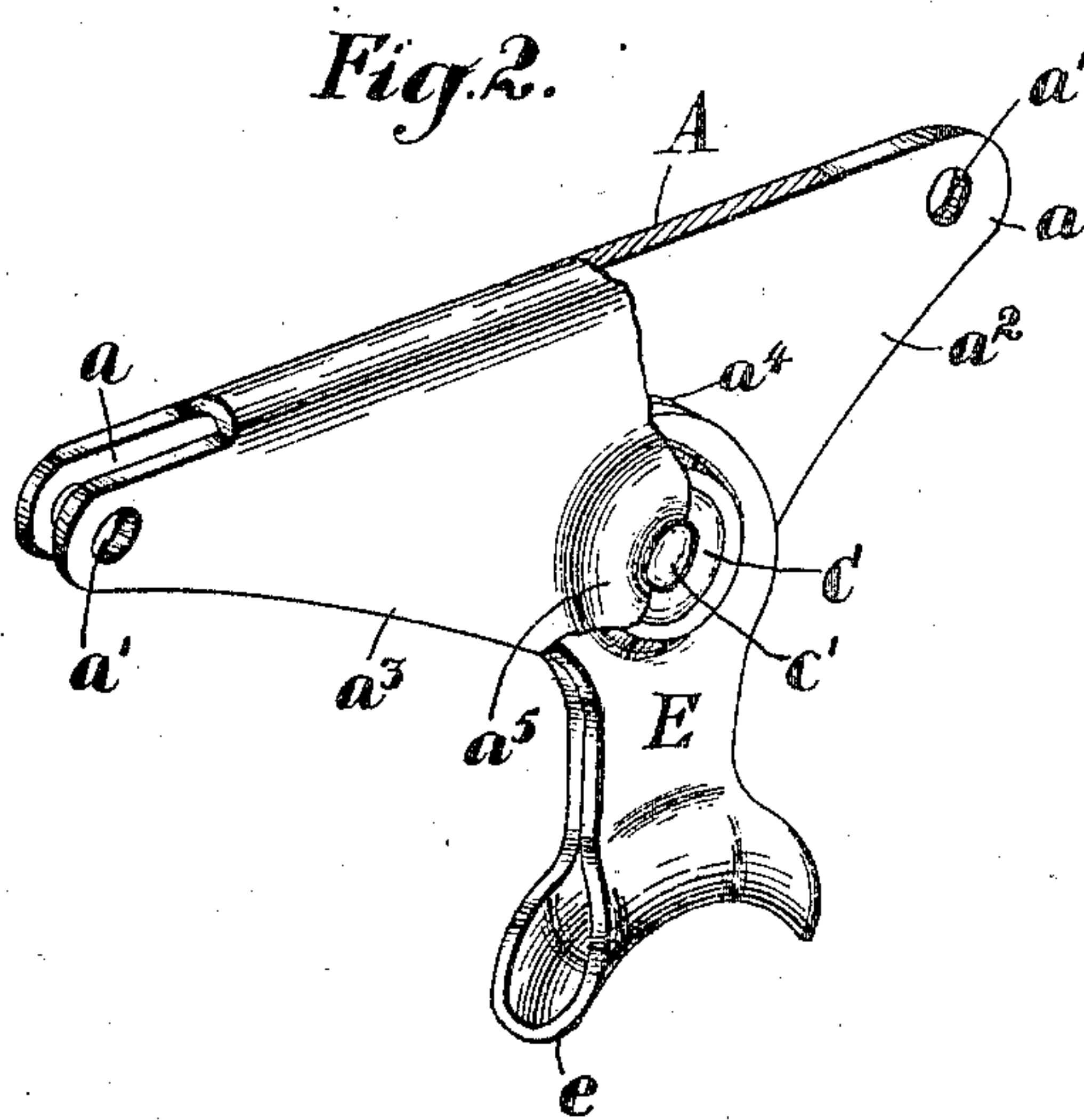
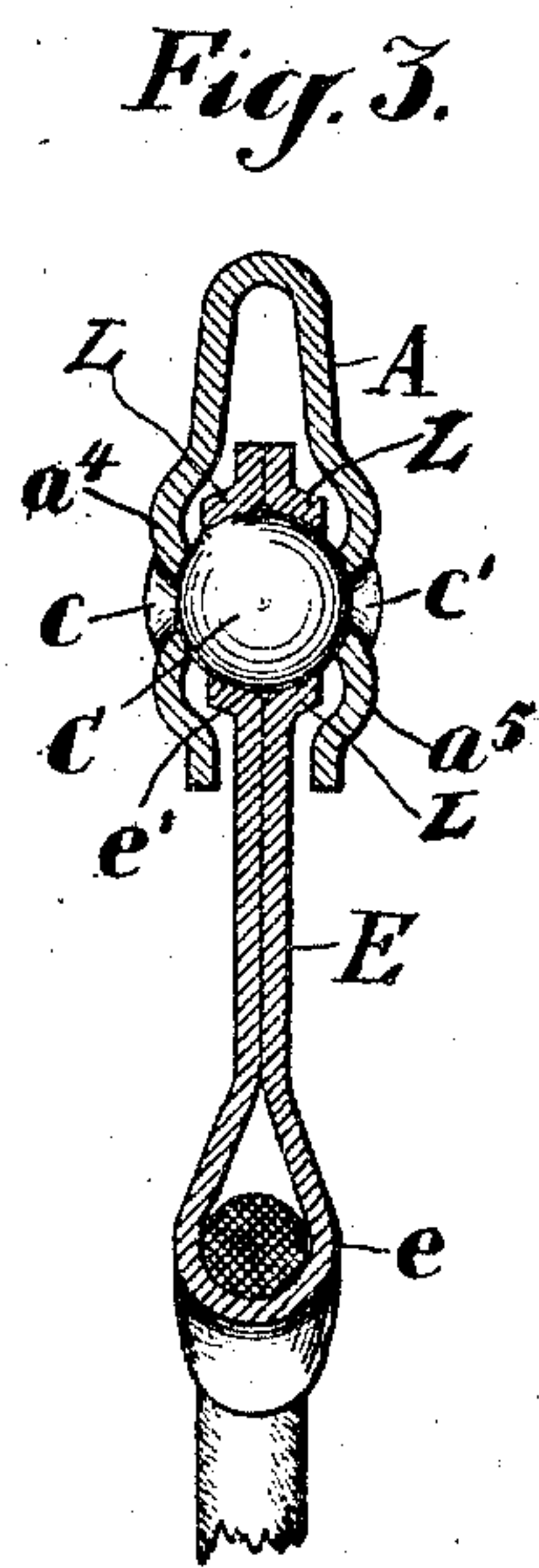
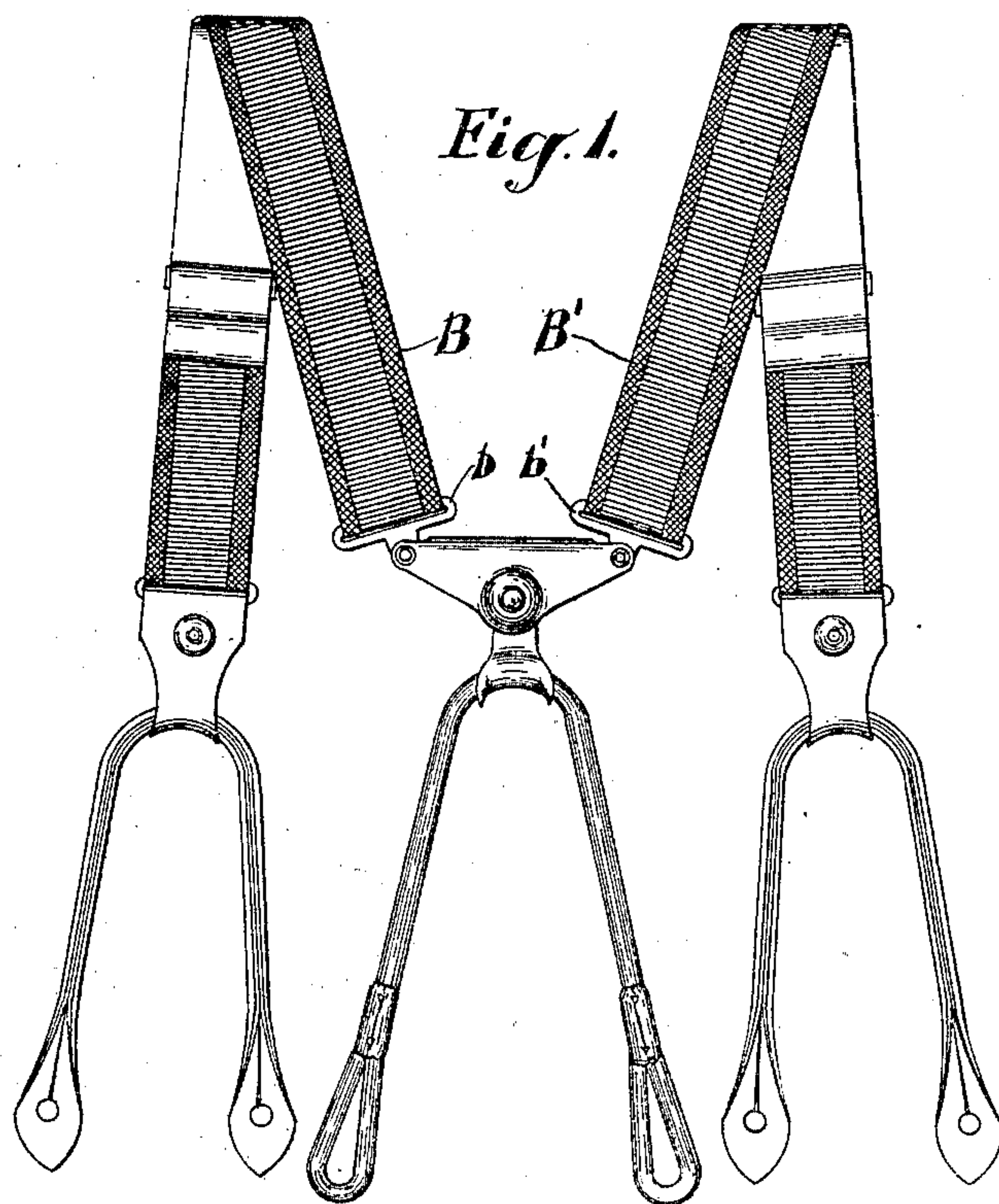
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PATENTED APR. 14, 1903.

H. C. HINE.
SUSPENDERS.

APPLICATION FILED SEPT. 11, 1902.

NO MODEL.



Witnesses;
F. C. Fiedner?
E. A. Jarvis.

Inventor:
Henry C. Hine
By his Attorney.
J. W. Richard

UNITED STATES PATENT OFFICE.

HENRY C. HINE, OF NEW BRITAIN, CONNECTICUT.

SUSPENDERS.

SPECIFICATION forming part of Letters Patent No. 725,249, dated April 14, 1903.

Application filed September 11, 1902. Serial No. 122,902. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. HINE, a citizen of the United States, residing in New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Suspenders, of which the following is a specification.

This invention relates to that class of garment-supporters generally designated as "suspenders," and has for its object to provide a connection between the shoulder-straps and the button ends, which connection constitutes a draft-equalizing device having a lever to which said straps are attached, a hanger pivoted to said lever and which receives the button end, and a ball-bearing or universal joint between said lever and hanger, thereby affording the requisite freedom of action and obviating the cutting away of the parts, while the device can be produced in a practicable and durable manner at a reasonable cost.

In the drawings forming part of this specification, Figure 1 illustrates a completed garment-supporting structure embodying my improvement. Fig. 2 illustrates perspectively my draft-equalizer, partly broken away to show the construction. Fig. 3 illustrates in section one method of assembling the parts, and Fig. 4 illustrates another method of assembling the parts.

Similar characters of reference indicate like parts throughout the drawings.

The beam or lever A of the draft-equalizer is preferably formed from sheet metal and in the present instance is provided at each extremity thereof with bifurcations a and eyes a' , in which are suitably mounted attachments $b b'$, which receive the shoulder-straps B and B', respectively. The beam or lever A is shown in yoke form—that is, as being bent upon itself or folded to form plates or walls a^2 and a^3 , and at the lower portion of each wall is an annular groove or depression $a^4 a^5$. Within the walls $a^2 a^3$, respectively, of said lever A and centrally of said annular grooves or depressions a^4 and a^5 is suitably mounted a ball C. A hanger E, also formed of sheet metal, is bent upon itself and forms at one end a cord eye or channel e , while the other end is provided with an eye or opening e' , which fits over the ball C and is permitted to rock or

sway universally in accommodation to any position the body of the wearer may assume. One form of mounting said ball in this lever is by providing said ball with lateral bearings or spurs $c c'$, which pass through the openings formed in said annular depressions and which are riveted over to hold the ball C in place, as shown in Fig. 3. In Fig. 4 is also illustrated another form of securing the ball C in place by causing the rivet d to be passed through the ball and then riveted in the usual manner to the lever A.

It will now be seen that a construction of this character renders practicable the use of very thin sheet metal, such as necessary for making garment-supporting trimmings, in that the ample working surface of the ball-bearing or universal joint receives the entire strain. Hence the cutting away of said parts is entirely obviated. It will also be noted that the hanger of the attachment swings universally, thereby allowing the attachment to accommodate itself to any position which the body might assume. It is also to be noted that this construction reduces friction to the minimum and offers but little, if any, resistance to the working parts of the trimmings. This is especially the case where the hanger-eyes are cupped to afford a larger socket-surface, as indicated at e' , Fig. 3.

It will be observed that the shoulder-strap lever A and suspender-end hanger E are connected by a ball-and-socket joint, the socket being formed upon one of said lever and hanger elements, preferably the hanger, and the ball being supported upon the other thereof in such a manner as to leave the crown of the ball free, so that the socket may ride upon the crown, thereby making an easy-working joint and avoiding liability of opening or splitting of the parts in use, especially since the socket is cupped. Preferably the top crown of the ball forms a seat upon which the socket hangs and bears the working stress. Preferably the ball is attached laterally to the lever, and the latter has a yoke form, as shown at Fig. 3, the ball being mounted within the yoke, the hanger also having an eye within the yoke, which incloses the ball. The hanger preferably consists of a pair of plates, formed by the folding of a sheet-metal blank, a cord

eye or channel *e* being formed at the fold and each of the plates having a cupped eye inclosing the ball. Each of the hanger-plates has an eye *e'*, and these eyes have cupped portions or flanges *L*, which fit over the ball. It will be observed that the cupped portion of one hanger-plate coöperates with the cupped portion of the other hanger-plate, these cupped portions taken together inclosing a large part of the periphery of the ball, thereby producing an easy-working and durable joint. These cupped portions or cups of course partake of the form of hemispherical depressions, and they may be more or less extensive—that is, they may approximate more or less closely the form of complete hemispherical cups or depressions within the scope of my invention. Preferably the ball is secured by means of one or more integral lateral projections *c* and *c'*, headed or clenched over the sides of the lever, and the hanger itself is preferably formed into the socket portion of the joint. The ball is preferably attached laterally to the lever—that is, the point of attachment of the ball to the lever is at the side of the ball, thus permitting the eyes of the hanger to hang upon the top or crown of the ball. Each of the lever and hanger elements, it will be seen, has a portion which faces a portion of the other of said elements—as, for instance, *a*⁴ upon the lever and *e'* upon the hanger—said portions being secured together by the ball-and-socket joint, and by reason of their face-wise relation preventing a reversal of the position of the hanger with relation to the lever, the hanger and lever being always maintained nearly in the same plane, thereby avoiding liability or injury to the wearer, which might occur if either the lever or the hanger could accidentally turn to a position at right angles to the other, so as to lie edgewise against the back of the wearer. The lever and hanger elements include suitable guard portions *a*⁴, *a*⁵, and *e'*, which render the hanger when in use irreversible with respect to the lever, although great freedom of movement of the lever is permitted in the same plane as the hanger and although there is also permitted a limited shifting of the lever into different planes. Preferably the range of vibration of the lever in the plane of the hanger is greater than its range of vibration or movement in any other direction.

Variations may be resorted to within the scope of my invention.

Having described my invention, I claim—

1. In combination, a shoulder-strap lever and a suspender-end hanger connected thereto by a ball-and-socket joint; the socket being formed upon one of said lever and hanger elements, and the ball being supported upon the other thereof, in such a manner as to leave the crown free, and the socket riding upon the crown of the ball.

2. In combination, a shoulder-strap lever and a suspender-end hanger hung thereon by a ball-and-socket joint; the ball being sup-

ported upon one of said lever and hanger elements, in such a manner as to leave one of the top and bottom crowns free for a working surface, and the other of said elements being fitted to said working surface; one of said socket and crown elements forming a seat upon which the other hangs.

3. In combination, a shoulder-strap lever and a suspender-end hanger; a ball being attached laterally to one of said elements so as to leave the crown of the ball free, and the other of said elements having an eye which incloses said ball and rides upon the crown thereof.

4. In combination, a shoulder-strap lever and a suspender-end hanger; one of said members having a yoke, and a ball being mounted within said yoke; and the other of said members having an eye also within said yoke and inclosing said ball.

5. In combination, a shoulder-strap lever and a suspender-end hanger; a ball being attached laterally to one of said elements, so as to leave the crown of the ball free, and the other of said elements having an eye which incloses said ball, said eye having a cupped portion forming a socket for the ball, and riding upon the crown of the ball.

6. In combination, a shoulder-strap lever and a hanger; one of said members having a yoke, and a ball being mounted within said yoke; and the other of said members having an eye also within said yoke and inclosing said ball, said eye having a cupped portion forming a socket for the ball.

7. In combination, a shoulder-strap lever and a hanger connected thereto by a ball-and-socket joint; the ball being supported upon one of said elements, and the other of said elements consisting of a pair of plates each having an eye which incloses the ball and rides upon the crown thereof.

8. In combination, a shoulder-strap lever and a hanger connected thereto by a ball-and-socket joint; the ball being supported upon one of said elements, and the other of said elements consisting of a pair of plates each having a cupped eye portion which incloses the ball and rides upon the crown thereof.

9. In combination, a shoulder-strap lever and a hanger connected thereto by a ball-and-socket joint; one of said elements being in the form of a yoke which embraces and supports the ball, and the other of said elements being of folded sheet metal; each part of the fold having an eye which incloses the ball.

10. In combination, a shoulder-strap lever and a hanger; said lever being in yoke form, and a ball being fixed within the yoke, and said hanger being formed of folded sheet metal and having a cord-eye formed at the fold and also having in each fold an eye which incloses said ball.

11. In combination, a shoulder-strap lever and a hanger; said lever being in yoke form, and a ball being fixed within the yoke, and said hanger being formed of folded sheet

metal and having a cord-eye formed at the fold and also having in each fold a cupped eye which incloses said ball.

12. In combination, a shoulder-strap lever and a hanger connected thereto by a ball-and-socket joint; the socket being formed upon one of said lever and hanger elements, and the ball being laterally supported upon the other thereof, so as to leave the crown of the ball free, and the socket riding the crown of the ball.

13. In combination, a shoulder-strap lever and a hanger connected thereto by a ball-and-socket joint; the ball being laterally supported upon and rigid with one of said lever and hanger elements, so as to leave the top and bottom crowns of the ball free, and the other of said elements being fitted upon the crown of said ball.

14. In combination, a shoulder-strap lever and a suspender-end hanger; a ball being attached laterally to said lever, so as to leave the crown of the ball free, and said hanger having an eye which incloses said ball and rides upon the crown thereof.

15. In combination, a shoulder-strap lever and a suspender-end hanger; said lever having a yoke, and a ball being mounted within said yoke; and said hanger having an eye also within said yoke and inclosing said ball.

16. In combination, a shoulder-strap lever and a suspender-end hanger; a ball being attached to one of said elements by means of lateral rivets formed upon the ball; and the other of said elements having an eye which incloses said ball.

17. In combination, a shoulder-strap lever and a hanger; said lever having a yoke, and a ball being mounted within said yoke; and said hanger having an eye also within said yoke and inclosing said ball; said eye having a cupped portion forming a socket for the ball.

18. In combination, a shoulder-strap lever and a hanger connected thereto by a ball-and-socket joint; the ball being supported upon said lever in a manner to leave the crown free, and said hanger consisting of a pair of plates each having an eye portion which incloses the ball and hangs upon the crown thereof.

19. In combination, a shoulder-strap lever and a hanger connected thereto by a ball-and-socket joint; said lever being in the form of a yoke which embraces and supports the ball, and said hanger being of folded sheet metal, each part of the fold having an eye which incloses the ball.

20. In combination, a shoulder-strap lever and a hanger; said lever being in yoke form, and a ball being riveted within the yoke, and said hanger being formed of folded sheet

metal and having a cord-eye formed at the fold and also being formed at its ends into eyes which inclose said ball.

21. In combination, a shoulder-strap lever and a suspender-end hanger; and a ball secured to said lever by means of a projection formed upon the ball; said hanger being formed of folded sheet metal and having a cord-eye formed at the fold and also having in each said plate an eye which incloses said ball and hangs upon the crown thereof.

22. The combination of a shoulder-strap lever and a hanger connected by a ball-and-socket joint; each of said lever and hanger members being formed of sheet metal, and one thereof being folded; and a ball being fixed between the folds, so as to leave the crown of the ball free, the other of said lever and hanger members being formed into a socket which fits the ball and rides upon the crown thereof.

23. In combination, a shoulder-strap lever and a hanger; each of said elements having a portion which faces a portion of the other of said elements; said portions being secured together by a ball-and-socket joint; and said portions by reason of their said relation preventing a reversal of the position of the hanger with relation to the lever.

24. In combination, a shoulder-strap lever and a hanger connected thereto by a ball-and-socket joint; said elements including suitable guard portions which render the hanger when in use irreversible with respect to the lever.

25. In combination, a shoulder-strap lever and a hanger connected by a ball-and-socket joint; said elements including suitable guard portions which render the hanger when in use irreversible with respect to the lever, while permitting great freedom of movement of the lever in the same plane as the hanger and a limited shifting of the lever into different planes.

26. In combination, a shoulder-strap lever and a hanger directly connected thereto by a ball-and-socket joint; the parts being so formed and assembled as to permit greater extent of vibration of the lever in the plane of the hanger than in any other direction.

27. In combination, a shoulder-strap lever and a suspender-end hanger, said lever being in yoke form and a ball being fixed within the said yoke, and said hanger being formed of folded sheet metal and having a cord-eye formed at the fold, and also having in each fold a cupped portion which incloses said ball.

HENRY C. HINE.

Witnesses:

F. W. BARNACLE,
FRED. J. DOLE.