No. 725,562. PATENTED APR. 14, 1903.

H. C. HINE.

SUSPENDERS.

APPLICATION FILED SEPT. 8, 1902.

NO MODEL.

Fig. 1.

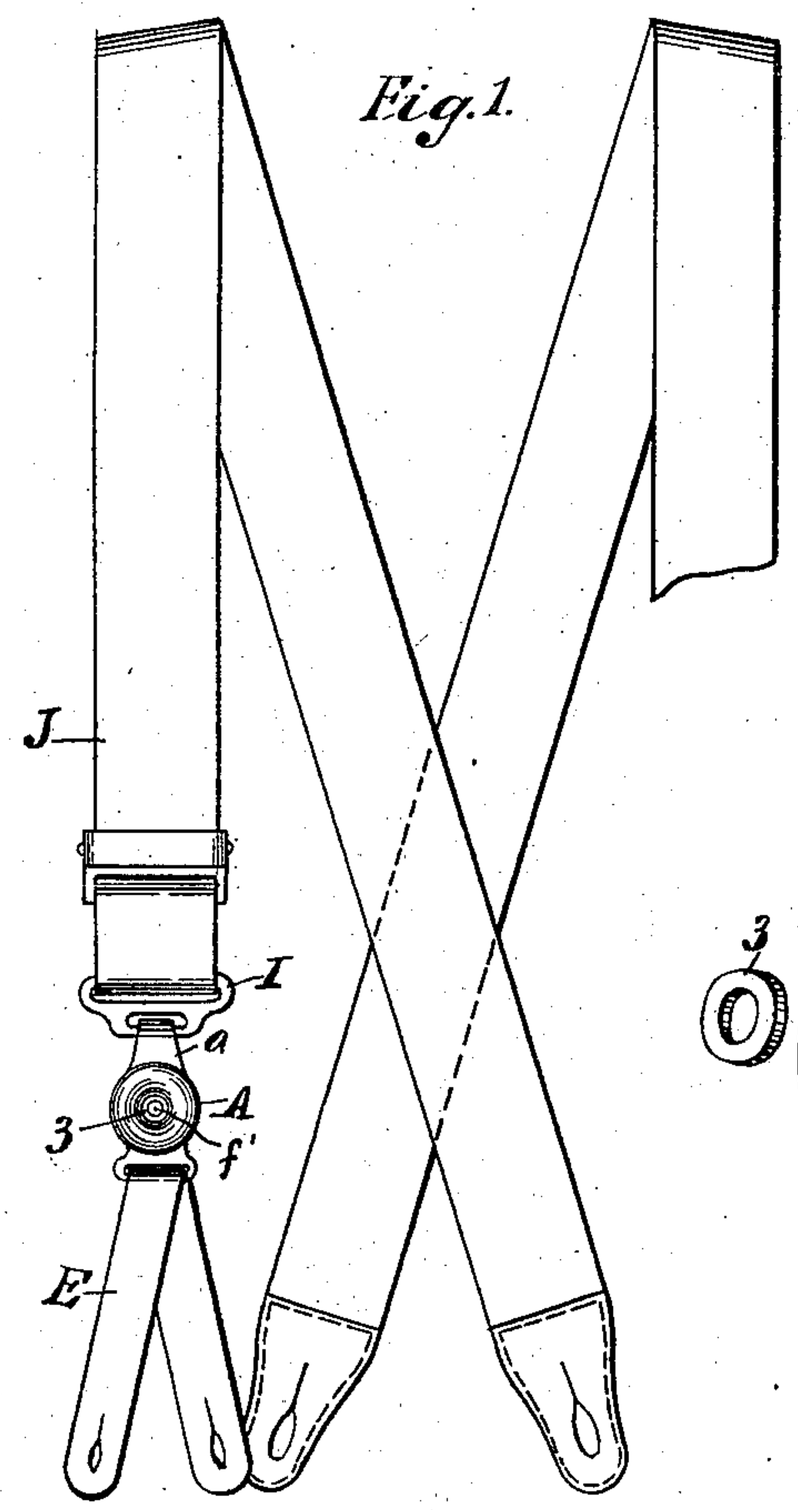


Fig. 3.

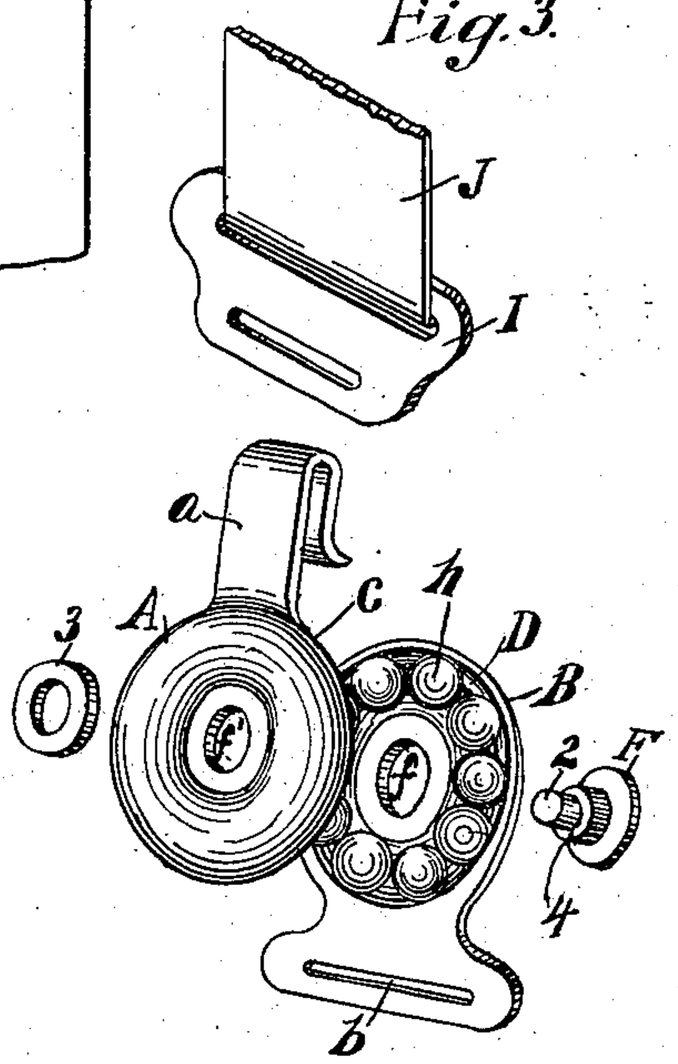


Fig. 2.

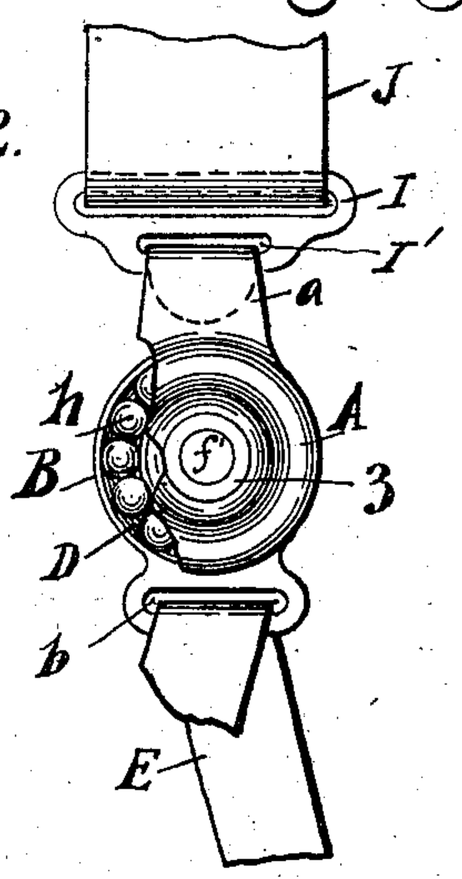
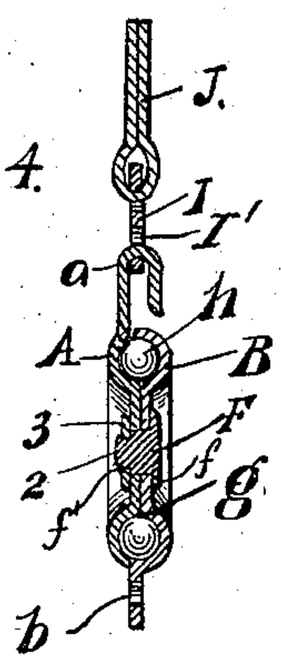


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY C. HINE, OF NEW BRITAIN, CONNECTICUT.

SUSPENDERS.

SPECIFICATION forming part of Letters Patent No. 725,562, dated April 14, 1903.

Application filed September 8, 1902. Serial No. 122,449. (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 commonly designated as "suspenders," having for one of its main objects to provide between the button ends and the shoulder-straps a connection comprising a pivoted member having a ball-bearing, thereby increasing the freedom of action of the supporters. These connections, commonly known as "trimmings," in order to be successfully produced are made of very thin metal—say of about one sixty-fourth of an inch in thickness. At this thickness the metal is easily workable. This extremely thin metal has caused a great deal of trouble when used for pivotal joints, in that it produced that knife-edge action at the joints which soon cut the parts away.

My improvement makes the use of very thin metal in pivoted trimmings possible and without the fear of being cut away by the use of ball-bearings at the pivot, which balls receive the strain and wear which would under other circumstances fall upon the pivot, and thereby is the cutting away not only obviated entirely, but a better and more easily working attachment is formed. This attachment, which may be employed upon other garment-supporters than suspenders, is especially intended in this instance to connect the button ends and the shoulder-straps of a garment-supporter at any point and is illustrated as a cast-off device in the accompanying drawings, in which—

Figure 1 illustrates a garment-supporter with the attachment applied. Fig. 2 illustrates the attachment or cast-off partly broken away to show its construction. Fig. 3 illustrates the disassembled components of the attachment, and Fig. 4 is a vertical section taken centrally of Fig. 2.

Similar characters of reference indicate like parts throughout the drawings.

The attachment herein illustrated is shown, preferably, in the form of two members A and B, each of which is provided with an annular depression or groove C and D, respectively. One of these members—as, for instance A—is provided with a hook *a* and the other member B with a loop-eye *b*, which receives the button end E. These two members A and B may be united together by any suitable means—such, for instance, as shown—which comprises a rivet F, which passes through openings *f* and *f'* in said members, and over the stud 2 of which is riveted a washer 3. When the parts are assembled, the annular channels C and D register and form an annular ball-race *g*, in which play a series of balls *h*, as shown in Figs. 2, 3, and 4. This attachment may form connection between the button end and the shoulder-straps in any suitable manner and is here shown as having the button end E passed through the loop *b* and also hooked to a member I, secured to the shoulder-straps J. The connecting plate or chape I is provided with an eye or slit I' for engaging the hook *a*. If used as a cast-off device, it will be obvious that the strap and button ends may be disconnected.

It will be seen that I have provided a pivoted member for forming connections between the shoulder-straps and the ends which are fastened to the buttons, so as to give freedom of action to the entire garment-supporter construction when in use. It will also be seen that the ball-bearings in this attachment receive all the strain and stress, so that the unusually thin sheet metal desirable in constructing these attachments may be used with perfect freedom and without the fear of the parts being cut away. It will also be noted that the two sheet-metal members A and B are pivoted together by means of a single set of bearing-balls *h*, each of said members having a struck-up groove and the balls running in the grooves, means being provided for holding said members and said balls in coöperative relation, said holding means preferably comprising a central rivet F, provided at one end with the usual head and at the other end having a shoulder 4, a washer, as 3, being riveted against said shoulder and the members A and B being confined between said washer and the head of said rivet. It will also be seen that one of the members A and B is formed with a hook, as *a*, and the other thereof is formed with means, as *b*, whereby

it may be connected to a strap or the like, and that the member A is provided with one part of a cast-off device and the member I with a complemental portion of said cast-off device, said part I being connected to a shoulder-strap.

Variations and modifications of construction may be resorted to within the scope of this invention, especially those which involve the employment of ball-bearings.

Having described my invention, I claim—

1. A garment-supporter comprising shoulder-straps, a rear suspender-end connected thereto, and suspender-ends connected to the front ends of said straps; the connection of each of said straps with its front suspender-end being effected by two sheet-metal members each of which is provided with a single annular groove, said sheet-metal members in each set being connected centrally of said grooves, so that the latter form a single ball-race, and a single set of balls operating in each race; one of said sheet-metal members in each set having means for attachment to its shoulder-strap, and the companion sheet-metal members being formed with means for attachment to a suspender-end.

2. In a garment-supporter, a cast-off device comprising an eye member and a hook member, a strap being connected to one of said members, and the other of said members being made of sheet metal and being provided with an annular groove, and a sheet-metal member having a companion groove and being formed with means for attachment to a strap, said sheet-metal members being pivotally connected centrally of said grooves, so that the latter form a ball-race, balls operating in said race, and straps connected to said eye member and to the second-mentioned sheet-metal member.

3. In a garment-supporter, a cast-off device comprising three members, whereof one is provided with a strap and also with a portion of a cast-off device and the remaining two are made of sheet metal and each provided with an annular groove, the first of said sheet-metal members being formed with the remaining portion of said cast-off device, and the second of said sheet-metal members being formed with means for attachment to a strap, said sheet-metal members being pivotally connected centrally of said grooves so that the latter form a ball-race, balls operating in said race, and a strap connected to the second sheet-metal member.

4. In a suspender of the class described, the combination with a pair of shoulder-straps, of a cast-off device attached to the front ends of each of said straps, said cast-off devices each comprising a sheet-metal hook member, a suspender-end member, a ball-race formed by grooves in said hook and suspender-end members, a set of balls working within said race, means for maintaining said members and said balls in coöperative relation, and suspender-ends respectively connected to said suspender-end members.

5. In a garment-supporter, an eyepiece, a strap attached thereto, two sheet-metal members, a single set of bearing-balls, each of said members having a struck-up groove and the balls running in the grooves, and means for holding the members and the balls in coöperative relation; one of said members being formed with a hook for engaging said eye, and the other thereof being formed with means whereby it may be connected to a strap or the like; and a strap connected to the last-mentioned member.

6. A pair of suspenders comprising two shoulder-straps provided with suitable means for connecting their rear ends to a garment, in combination with suspender-ends connected to the front ends of the shoulder-straps by means of a pair of sheet-metal members each having a ball-groove, balls running in said grooves, and means for holding said sheet-metal members and said balls in coöperative relation; one of said sheet-metal members in each of said button ends being provided with a portion of a cast-off member, and the remaining portions of the cast-off members being carried upon the shoulder-straps.

7. A trimming for a garment-supporter, comprising two sheet-metal members pivoted together by means of a single set of bearing-balls, each of said members having a single struck-up groove, and the balls running in the grooves, and means being provided for holding the members and the balls in coöperative relation; one of said members being formed with a hook, and the other thereof being formed with means whereby it may be connected to a strap or the like; said trimming also comprising a sheet-metal member which has an eye for engagement with said hook, and which also has means whereby it may be connected to a strap or the like.

8. A pair of suspender-ends, to each of which is connected a trimming comprising a sheet-metal member having formed therein a single ball-bearing groove, a sheet-metal member formed with a companion groove and also provided with a portion of a cast-off device, a set of balls running in the grooves, means for holding said sheet-metal members in coöperative relation with said balls, a member having the complemental portion of said cast-off device; in combination with shoulder-straps to which the said complemental members are connected.

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