

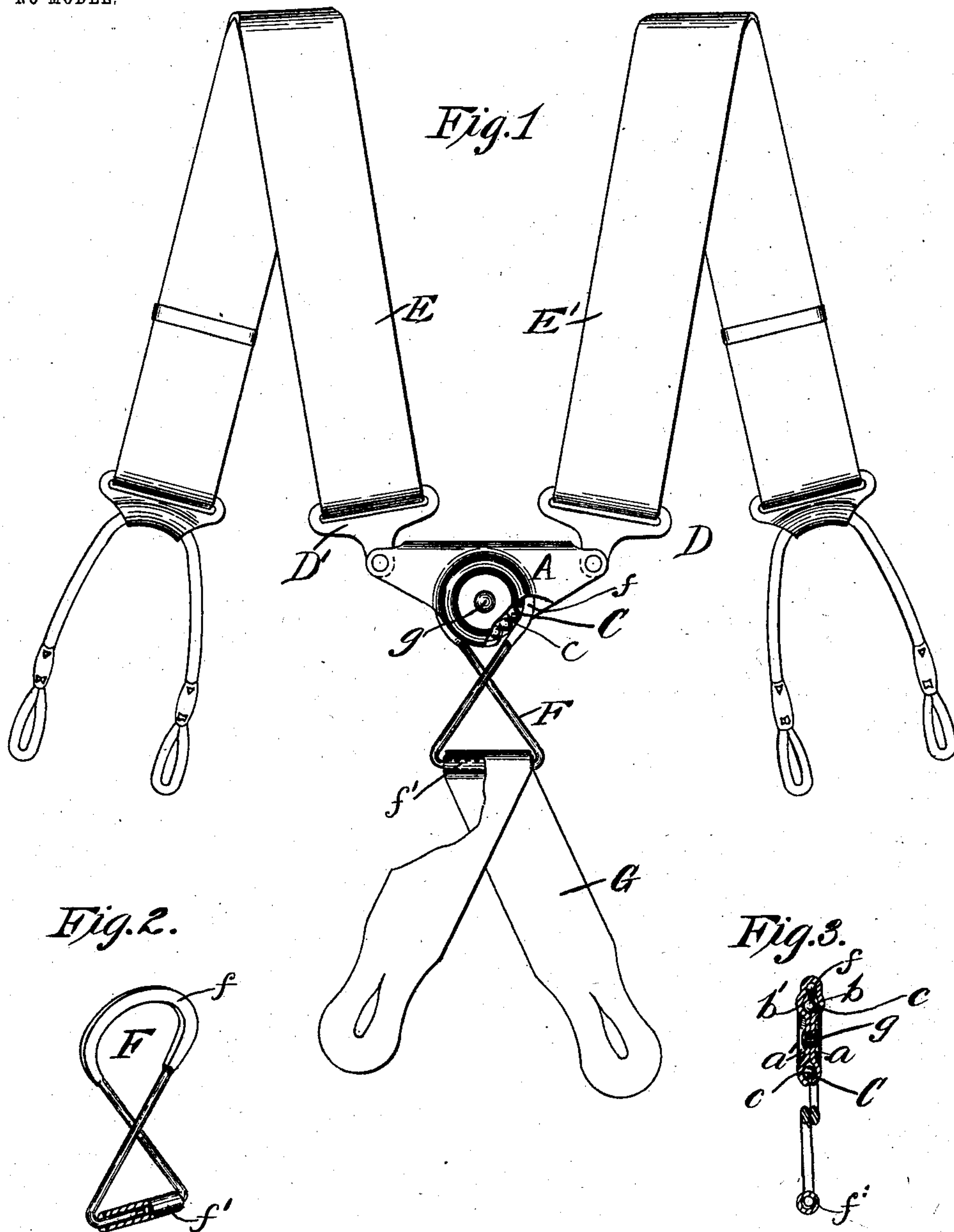
No. 720,521.

PATENTED FEB. 10, 1903.

H. C. HINE.
SUSPENDERS.

APPLICATION FILED SEPT. 2, 1902.

NO MODEL.



Witnesses
Herbert J. Smith
H. E. Maynard.

Inventor:
Henry C. Hine.
By his Attorney
J. H. Richards

UNITED STATES PATENT OFFICE.

HENRY C. HINE, OF NEW BRITAIN, CONNECTICUT.

SUSPENDERS.

SPECIFICATION forming part of Letters Patent No. 720,521, dated February 10, 1903.

Application filed September 2, 1902. Serial No. 121,740. (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."

Owing to the necessity of employing extremely thin sheet metal in making trimmings for suspenders it has heretofore been found impracticable to use a shoulder-strap lever pivoted to a hanger, for the reason that the thinness and the peculiar character of the sheet metal which is employed in making these trimmings prevented, this in so far as the thin metal presents an edge which soon cuts the parts in two.

The object of this invention, therefore, is to avoid this difficulty, to provide a ball-bearing joint, and thus enable the use of a lever and hanger so pivoted together to have great durability and avoid altogether the cutting action of the edge or edges of the thin metal, and making a practical article for the market at a comparatively low cost.

Referring to the drawings, Figure 1 illustrates a suspender having the equalizer applied. Fig. 2 is a perspective view of a hanger, and Fig. 3 is a longitudinal section of the equalizer and hanger.

Similar characters of reference designate like figures in the drawings.

The lever A of the equalizer is formed of sheet metal and is bent to form a yoke having two walls *a* and *a'*. These walls are each provided with an annular depression or groove *b* and *b'*, which form an annular race *c*, in which steel balls C are disposed. Pivoted to this lever A are attachments D and D' for connecting the shoulder-straps E and E'.

A hanger F depends from the lever A, said hanger being made of wire and being formed or provided with a loop portion *f*, which has its bearing directly on the balls C. The lower portion of this hanger is provided with a roller *f'*, on which rests the suspender-end G.

When the parts are assembled, the walls of the lever A are firmly riveted together, as at *g*, whereby the hanger F and the balls C are

permanently confined within the annular race *c*.

It will be seen that I have provided a joint for a garment-supporter comprising two pivoted members A and F, one thereof having a ball-channel and the other thereof having a wire loop concentric with said channel, that a set of bearing-balls runs in the channel in contact with the loop, the latter preferably being of larger diameter than the ball-channel and inclosing the balls, that the member A preferably consists of a pair of plates or walls formed in this instance by folding a metal blank, and that the wire loop *f* is inserted between said plates or walls—that is, between the folds *a* and *a'* of the lever—and that the portion of the wire which forms the loop is flattened at *f*, Fig. 2, so as to increase its stiffness.

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

Having described my invention, I claim—

1. In a garment-supporter, the combination with a pair of shoulder-straps, of a suspender-end, an equalizer connecting said straps and end, said equalizer comprising a lever having two walls, an annular groove in each of said walls, said groove constituting a ball-race, balls running in said race, and a wire frame mounted in said race and carried by said balls and attached to said suspender-end.

2. In a garment-supporter, the combination with a pair of shoulder-straps and a suspender-end, an equalizer connecting said suspender-end and straps, and comprising a lever, a ball-race formed by said lever, balls operating in said race, a wire frame carried directly upon said balls, and a roller carried by said frame which supports said suspender-end.

3. In a suspender of the class described, the combination with straps and a suspender-end, of an intermediate part carried by the straps and comprising a yoke, a ball-race in said yoke, balls carried in said race, and a wire frame also carried by said yoke and supported directly upon said balls; means being provided upon said yoke for receiving the straps and also upon said frame for receiving the suspender-end.

4. A joint for a garment-supporter, comprising two pivoted members, one of said mem-

bers having a ball-channel, and the other thereof having a wire loop concentric with said channel; and a set of bearing-balls in said channel and running in contact with
5 said wire loop.

5. A joint for a garment-supporter, comprising two pivoted members, one of said members consisting of sheet metal and having a ball-channel, and the other of said members
10 having a wire loop of larger diameter than said channel; and a set of bearing-balls within said channel and inclosed by said wire loop.

6. A joint for a garment-supporter, comprising
15 two pivoted members, one of said members consisting of a folded plate of sheet metal, the folds having parts to form a ball-race, and the other of said members being formed of wire and comprising a loop inserted
20 between said folds; and a set of bearing-balls running in said race within said loop.

7. A joint for a garment-supporter, comprising two metal members pivoted together; one of said members having a race and the other
25 of said members being formed of wire and having a loop, a portion of the wire forming the loop being flattened so as to stiffen the loop; and a set of bearing-balls within said race and inclosed by said loop.

8. In combination, a shoulder-strap lever
30 and a suspender-end hanger, one of said members consisting of two plates forming a ball-channel, and the other thereof having a wire loop inserted between said plates; and a set of bearing-balls in said channel and running
35 in contact with said wire loop.

9. In combination, a shoulder-strap lever and a suspender-end hanger, one of said members consisting of sheet metal and having a
40 ball-channel, and the other of said members having a wire loop of larger diameter than said channel; and a set of bearing-balls in said channel and inclosed by said wire loop.

10. In combination, a shoulder-strap lever

and a suspender-end hanger, one of said mem- 45
bers consisting of a folded plate of sheet metal, the folds having parts to form a ball-race, and the other of said members being formed of wire and comprising a loop inserted
50 between said folds; and a set of bearing-balls running in said race within said loop.

11. A joint for a garment-supporter, comprising two metal members pivoted together; one of said members having opposite walls which are secured together and form a ball- 55
race, and the other of said members being formed of wire and having a loop, a portion of the wire forming the loop being flattened so as to stiffen the loop; and a set of bearing-balls within said race and inclosed by 60
said loop.

12. In combination, a shoulder-strap lever and a suspender-end hanger, said lever consisting of two plates forming a ball-channel, and said hanger having a wire loop inserted 65
between said plates; and a set of bearing-balls in said channel; said wire loop being suspended upon said balls.

13. In combination, a shoulder-strap lever and a suspender-end hanger, said lever consisting of sheet metal and having a ball-channel, and said hanger having a wire loop of larger diameter than said channel; and a set of bearing-balls in said channel and inclosed
75 by said wire loop.

14. In combination, a shoulder-strap lever and a suspender-end hanger, said lever consisting of a folded plate of sheet metal, the folds having parts to form a ball-race and being secured together, and said hanger being 80
formed of wire and comprising a loop inserted between said folds; and a set of bearing-balls running in said race within said loop.

HENRY C. HINE.

Witnesses:

F. W. BARNACLO,

P. L. WELLS.