No. 733,322. PATENTED JULY 7, 1903.

F. HACHMANN.

CONNECTING AND STRAIN EQUALIZING DEVICE.

APPLICATION FILED NOV. 12, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

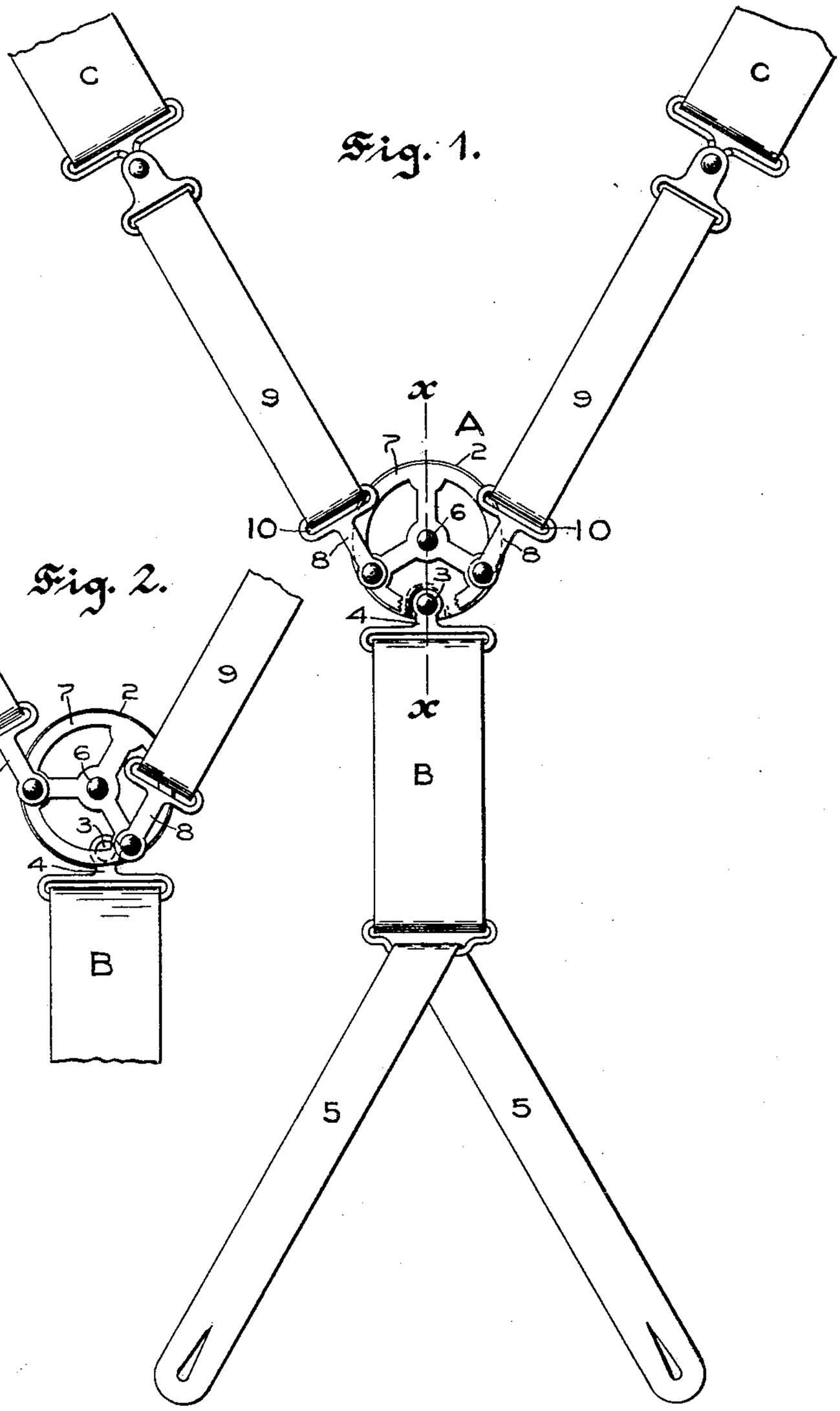

Fig. 2.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

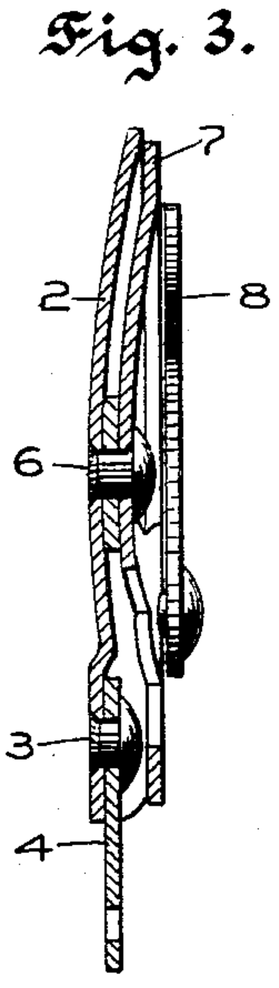


Fig. 4.

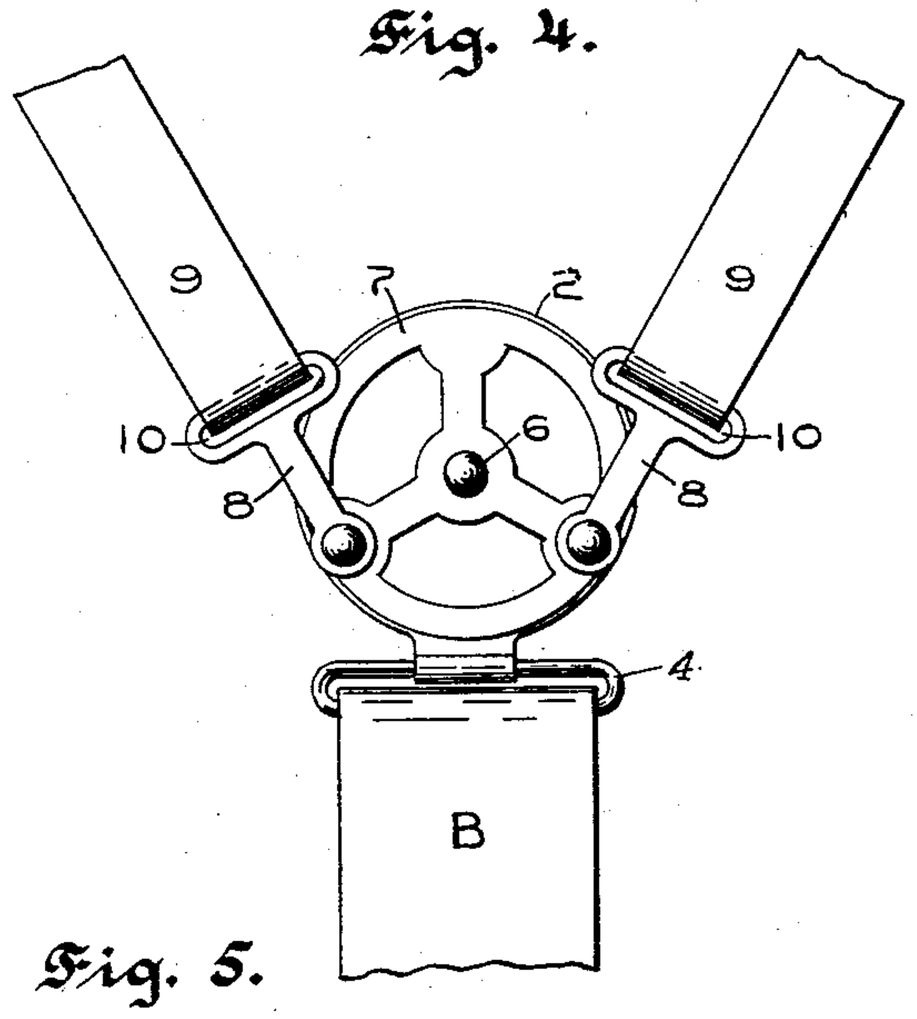
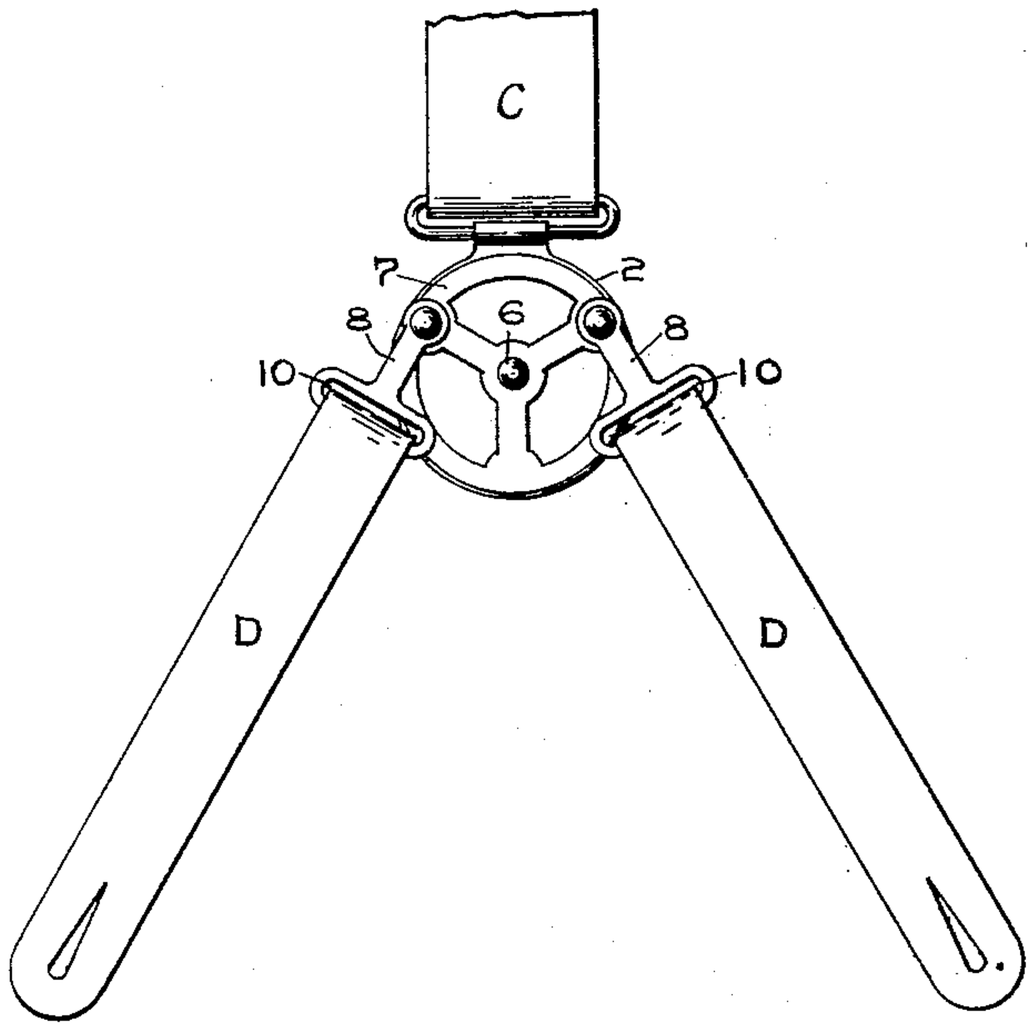


Fig. 5.



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UNITED STATES PATENT OFFICE.

FREDERICK HACHMANN, OF ST. PAUL, MINNESOTA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO ARTHUR P. LOTHROP, H. S. JOHNSON, CHARLES L. WELLS, AND ARTHUR D. WARD, OF ST. PAUL, MINNESOTA.

CONNECTING AND STRAIN-EQUALIZING DEVICE.

SPECIFICATION forming part of Letters Patent No. 733,322, dated July 7, 1903.

Application filed November 12, 1901. Serial No. 81,987. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK HACHMANN, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Connecting and Strain-Equalizing Devices, of which the following is a specification.

My invention relates to improvements in connecting and strain-equalizing devices for suspenders and other articles of wearing-apparel, such as hose-supporters, wherein certain of the parts are subjected to varying and unequal strains caused by the movements of the wearer's body, and has for its object to provide a device which shall allow such parts to adapt themselves to the unequal strains and at the same time avoid, as far as possible, the use of running cords and the discomfort caused the wearer by the edges and projections of metal parts.

To this end my invention consists in the construction, combination, and arrangement of parts hereinafter described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a view of the back of a pair of suspenders wherein the shoulder-straps are connected with each other and with the back strap by my improved device. The device is here shown with the parts in normal position when the shoulder-straps are subjected to equal strains, the rotatable disk being partly broken away to show the pivotal connection of the back plate. Fig. 2 is a view showing the position assumed by the parts of the device when the shoulder-straps are subjected to unequal strains. Fig. 3 is a vertical section taken on line *x x* of Fig. 1. Fig. 4 is a view showing a modified form of the device, and Fig. 5 is a view of the invention as applied to the front button-tabs of a pair of suspenders.

The connecting and equalizing device proper, which is designated in the drawings by the letter A, consists, broadly, of a back plate or shield adapted to be suitably secured to some comparatively fixed garment part, such as the back strap B in a pair of suspenders, as shown in the drawings, and a disk rotatably mounted upon the back plate and adapted to be engaged at two points positioned near the edge and at a suitable distance apart by the garment parts, which are subjected to varying and unequal strains, such as the shoulder-straps C or the button-tabs D in a pair of suspenders, as shown in the drawings.

In the drawings, 2 represents the back plate or shield, which is preferably circular in outline in order to present as small a surface as possible and at the same time effectually to shield the body and garment of the wearer from the moving parts. This back plate or under disk is made, preferably, with a convex under face in order to present an easy bearing-surface to the wearer's body and to keep its edge as far as possible away from and out of contact with the body and garment of the wearer. Pivotally connected with the back plate 2 at a point near its edge by the pivot 3 is a link 4, adapted to be suitably connected with the trousers by the back strap B and button-tabs 5 or in any other suitable manner.

Centrally and rotatably mounted upon the pivot 6, at the center of the back plate and upon its outer side, is a disk 7, preferably convex upon its under face, having a diameter not to exceed and preferably a little less than the diameter of the back plate in order that its edge may be shielded from the wearer's body. Pivotally secured to the disk 7, near its edge, at two points a suitable distance apart are links 8, adapted to be connected each with the adjacent shoulder-strap C. The links may be connected with the shoulder-straps directly or preferably by means of connecting-strips 9, of less width than the shoulder-straps, and passing through loops 10, carried by or formed in the links 8.

In order to obtain the greatest length and ease of movement, I prefer to have the points of pivotal connection normally so positioned that a strain upon one of the shoulder-straps will exert a pull at as nearly a right angle as possible to the radius of the disk at the point of pivotal connection. As suspenders are commonly adjusted I attain this result by positioning the points of pivotal connection below the center of the disk and approximately

one hundred and twenty degrees apart, as shown in the drawings. The disk may be solid or it may be cut away, as shown in the drawings, leaving hub, rim, and spokes. When the disk is so cut away, it is preferable, but not essential, to pivot the links 8 to the disk at the points of junction between the spokes and rim. By making the disk 7 convex upon its under side sufficient space will be left between it and the back plate to afford a clearance for the head of the pivot 3.

If desired, the back plate, instead of being pivotally connected with the link 4, as shown in Figs. 1 and 2, may be hinged thereto, as shown in Fig. 4, so as to be movable in a transverse plane from back to front.

Fig. 5 shows my invention applied to the front ends of the shoulder-straps. The back plate may be attached to the shoulder-strap in the same manner in which it is attached to the back strap B, in Figs. 1 and 4, the position of the parts being merely reversed, so that the back plate is suspended from the shoulder-strap and the links 8 are pivoted to the disk above instead of below the center. To the links 8 are attached the button-tabs D instead of the shoulder-straps, as shown in Fig. 1.

The operation of the device is illustrated in Fig. 2. When a greater strain is exerted upon one of the shoulder-straps than upon the other, the rotatable disk 7 will be turned upon its axis in the direction of the pull, allowing the shoulder-strap connection on that side to be lengthened and correspondingly shortening the connection on the other side, thus tending to equalize the strains. The equalization of the strains is much facilitated by having the back plate pivoted to the link 4, for the pull being exerted at the side of the disk will cause the back plate to turn upon its pivot 3 toward the side from which the pull comes, as shown in Fig. 2.

It is obvious that various modifications may be made in the details of the device without departing from the principle of my invention, the scope of which is defined in the claims.

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

1. A device of the class described, comprising a back plate adapted to be secured to a relatively fixed garment part, a rotatable disk centrally pivoted upon the back plate, a pair of straps, pivotal connections between the adjacent ends of the straps and the outer sides of the rotatable disk, said pivotal connections being upon the side of the disk-pivot away from the straps and being of less distance apart than the diameter of the disk, as and for the purpose set forth.

2. A device of the class described, comprising two disks of substantially equal diameters, the under disk having a convex under side, and the upper disk being centrally pivoted to the under disk, means for securing the under disk to a relatively fixed garment part, and a pair of straps pivotally connected to the upper disk at two points near the edge thereof, said pivotal strap connections being positioned between the pivotal support of the disk and the fixed garment part, and at a less distance apart than the diameter of the disk.

3. In a pair of suspenders, the combination, with the shoulder-straps, of an equalizing device therefor consisting of two disks of substantially equal diameters, the under disk having a convexed under side, and the upper disk being centrally pivoted to the under disk, means for connecting the under disk with the rear of the trousers, and means for pivotally connecting the shoulder-straps with the upper disk near the edge thereof and substantially midway between the center and lower edge of said upper disk.

4. In a pair of suspenders, the combination with the shoulder-straps and the back strap, of a pair of disks of substantially equal diameters, the under disk being pivotally connected at its lower edge to the back strap, and the upper disk being centrally pivoted to the under disk, and means for pivotally connecting the shoulder-straps with the upper disk near the edge thereof and substantially midway between the center of said upper disk and the bottom thereof.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK HACHMANN.

Witnesses:

W. H. PALMER,

EMILY EASTMAN.