

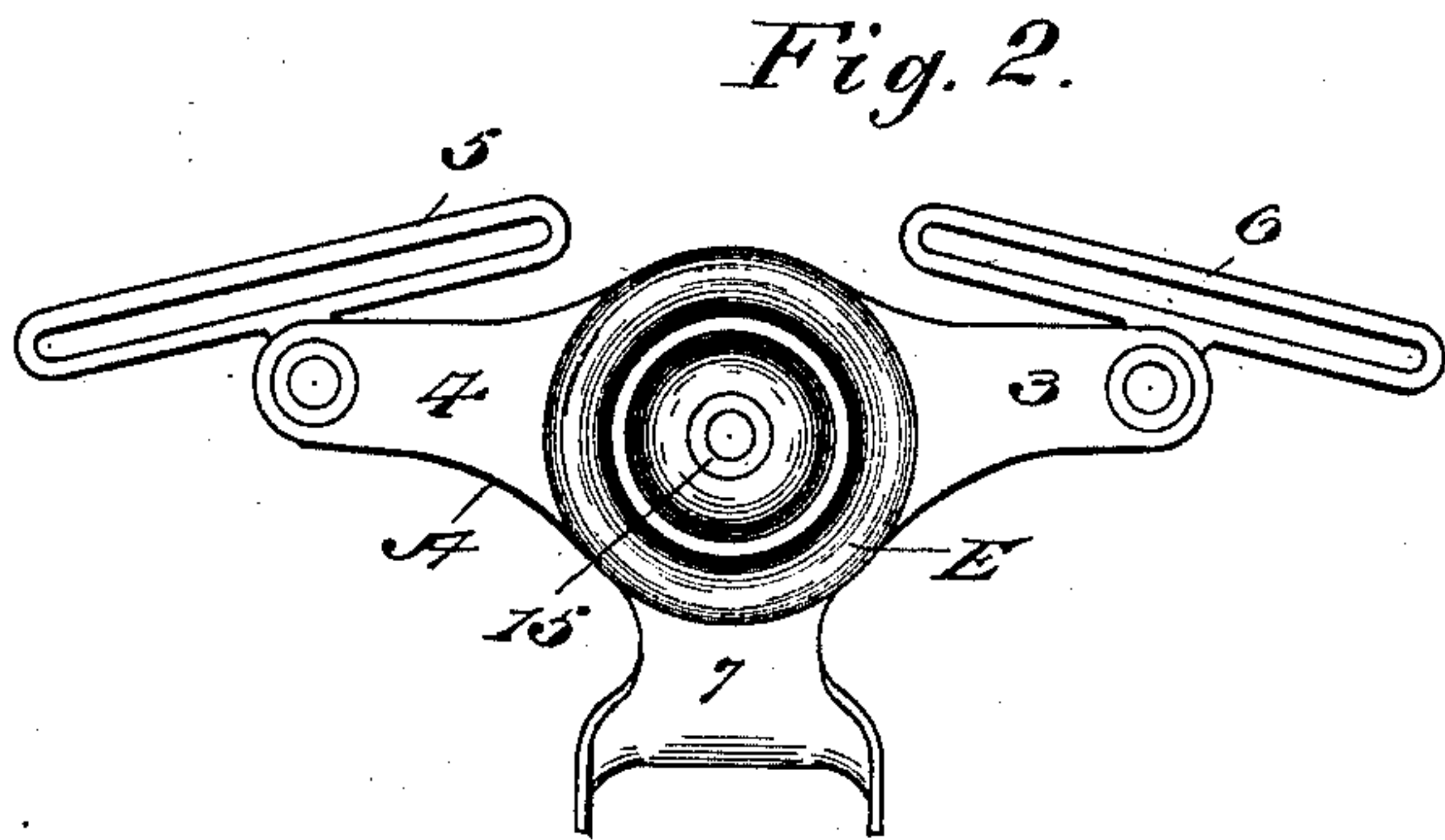
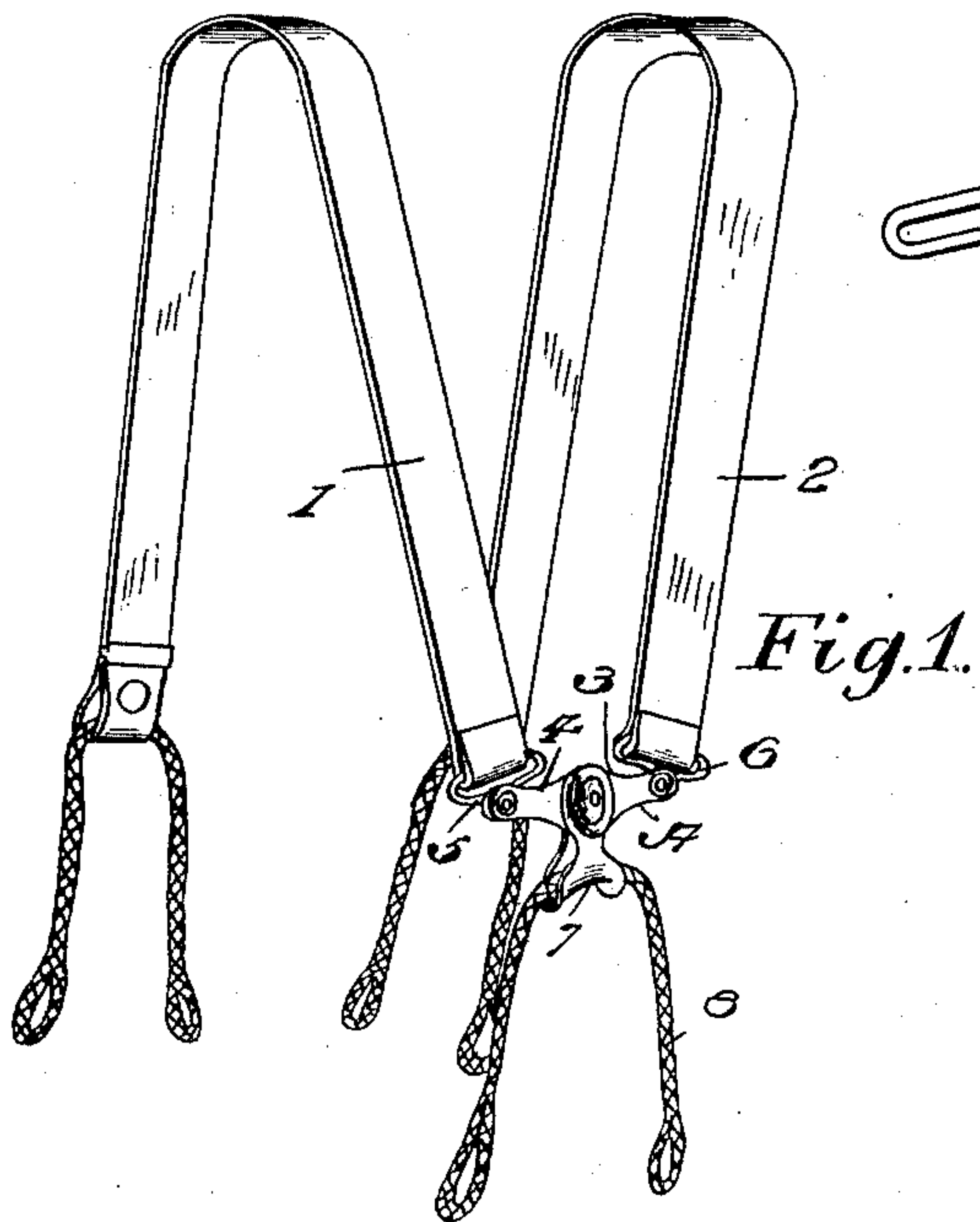
No. 711,314.

Patented Oct. 14, 1902.

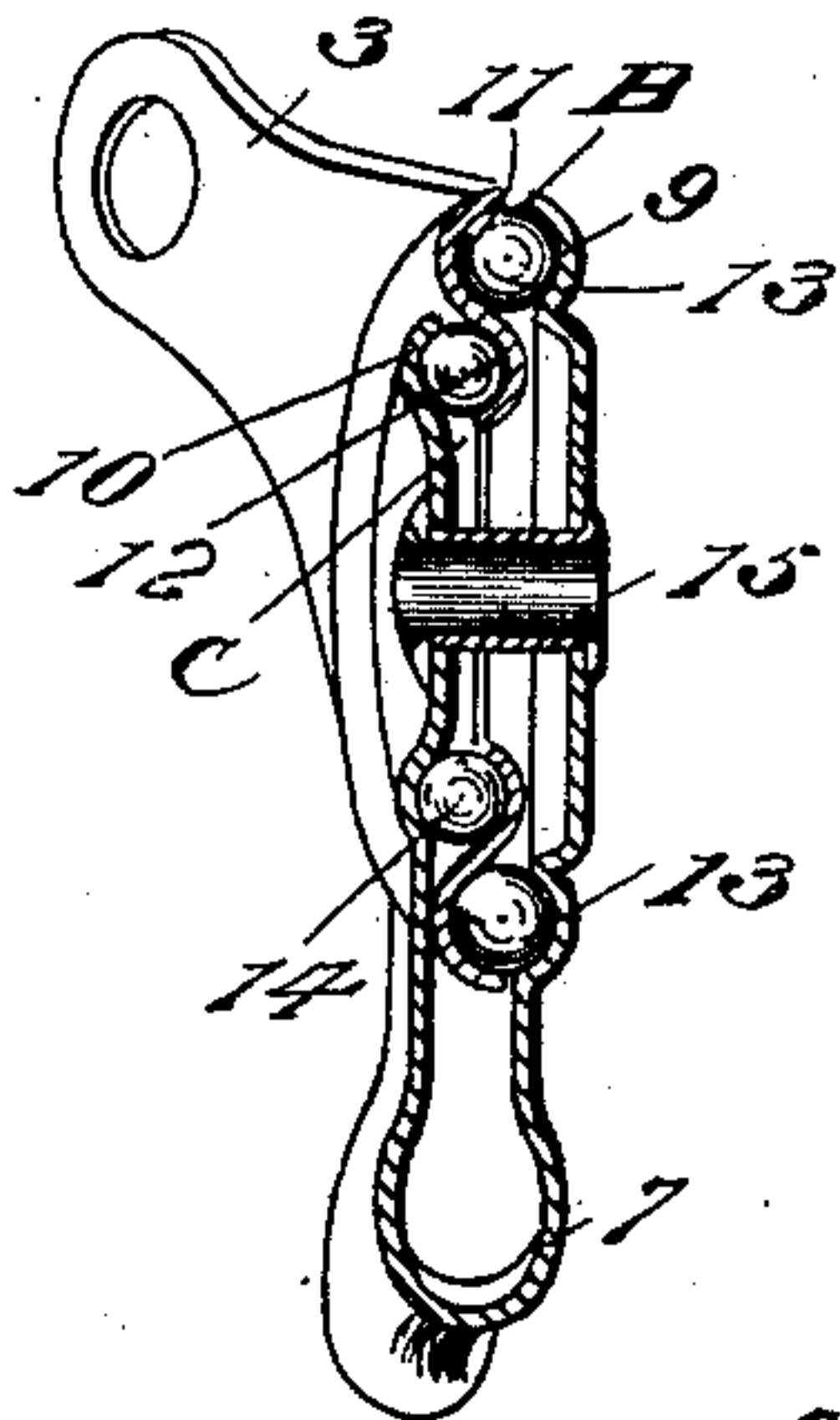
H. C. HINE.  
SUSPENDERS.

(Application filed July 8, 1902.)

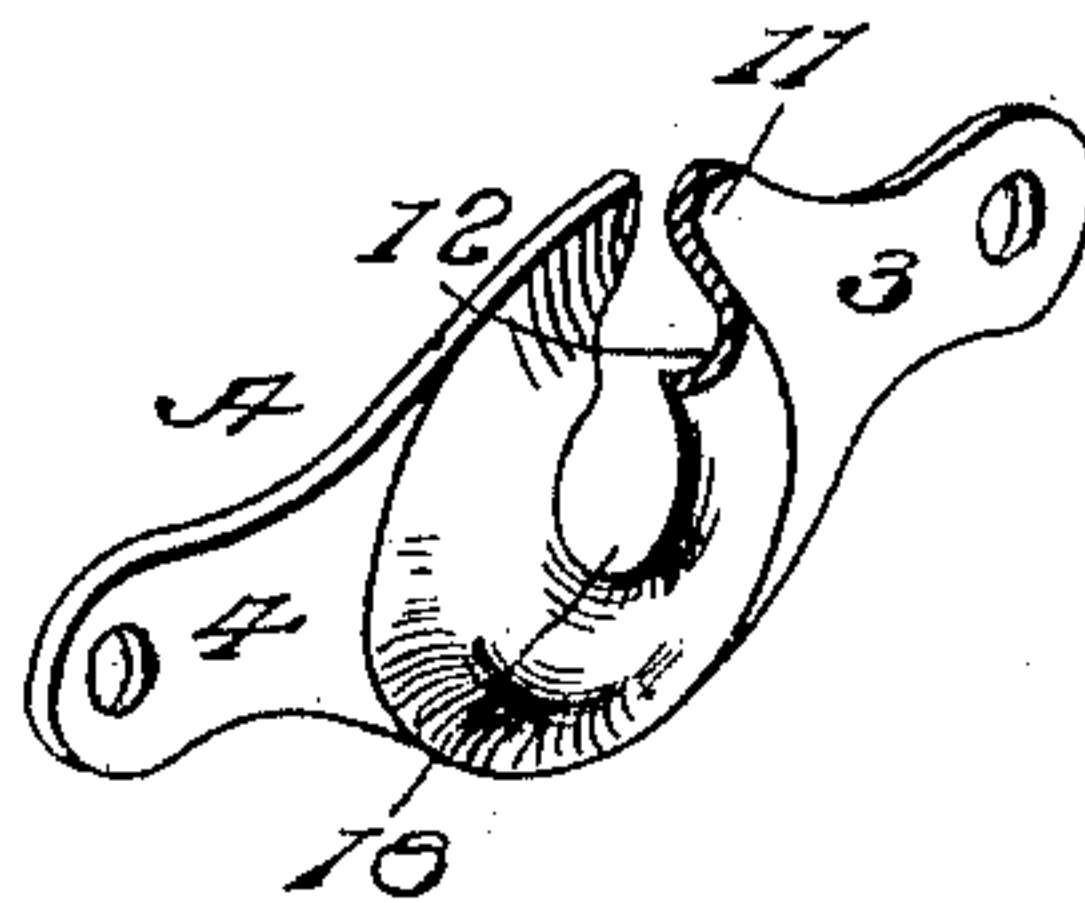
(No Model.)



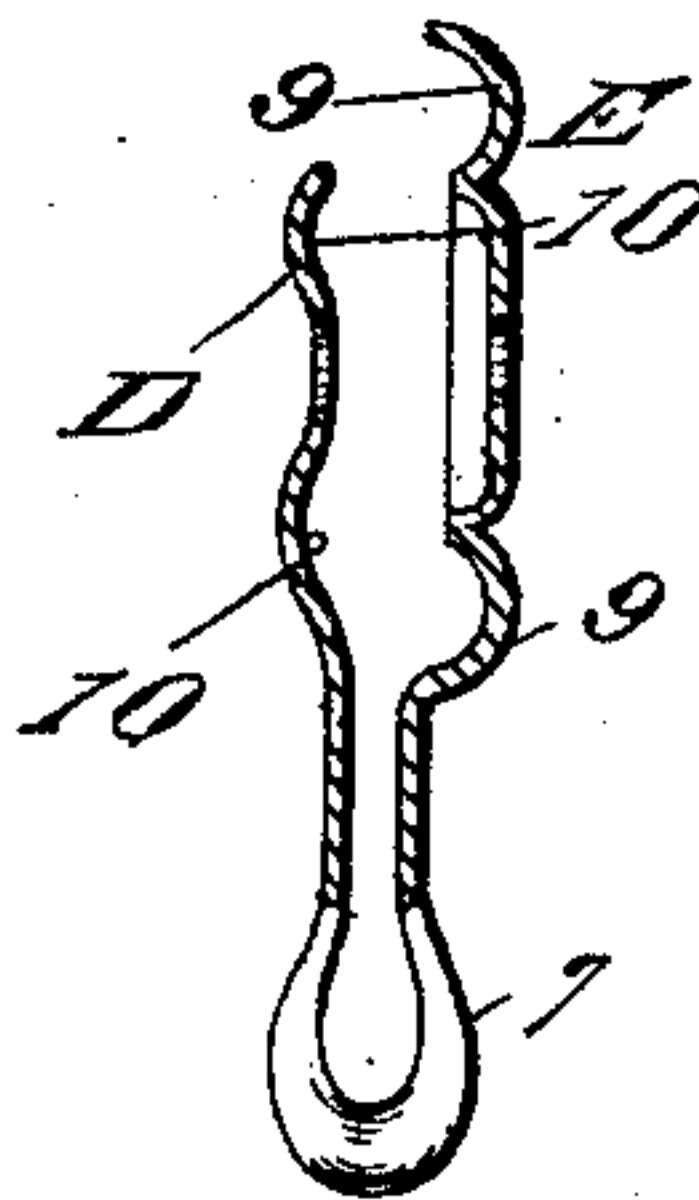
*Fig. 3.*



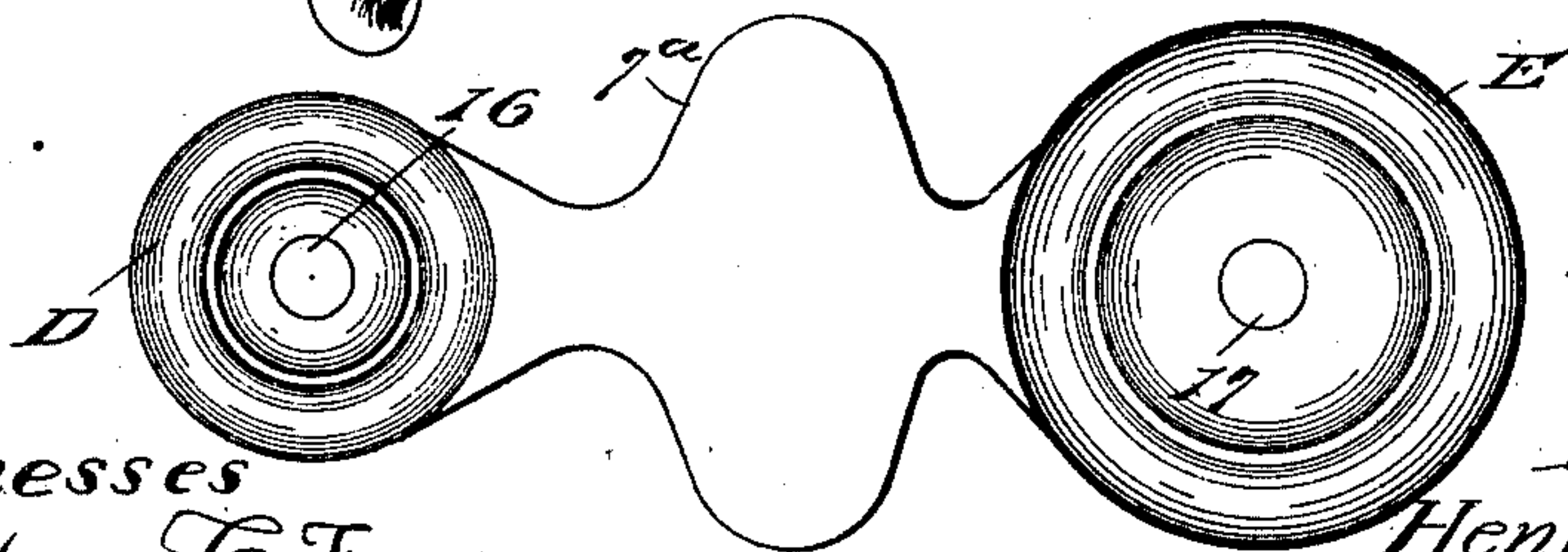
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



Witnesses  
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# UNITED STATES PATENT OFFICE.

HENRY C. HINE, OF NEW BRITAIN, CONNECTICUT.

## SUSPENDERS.

SPECIFICATION forming part of Letters Patent No. 711,314, dated October 14, 1902.

Application filed July 8, 1902. Serial No. 114,818. (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 garment-supporters of the character made the subject-matter of my pending application, filed June 20, 1902, Serial No. 112,404, (patent No. 708,882, dated September 9, 1902;) and its object is to simplify and improve the construction of the article, and particularly of the joint between the shoulder-strap-equalizing lever and the hanger pivoted thereto.

In the accompanying drawings, Figure 1 is a perspective of a pair of suspenders made in accordance with my present improvements. Fig. 2 is an enlarged face view of an equalizing-lever and its appurtenances. Fig. 3 is a perspective sectional view taken on a vertical line passing through the axis of the ball-bearing joint. Fig. 4 is a perspective of the lever. Fig. 5 is a sectional view of the hanger. Fig. 6 shows a blank from which the hanger is folded.

In the several views similar parts are designated by similar characters of reference.

The pair of suspenders shown in Fig. 1 comprises shoulder-straps 1 and 2; an equalizing-lever A, said lever consisting of arms 3 and 4 and being connected to said straps by pivoted fittings 5 and 6; a loop-form or folded hanger or stirrup 7, pivoted to the middle of said equalizing-lever A, and an attaching-cord 8, working in the hanger 7. The opposing arms of the hanger 7, which fork or clasp the lever A, are provided with struck-up annular depressions or tracks 9 and 10, which match depressions 11 and 12, formed upon the lever, said depressions or tracks 9 and 11 forming a ball-race B, in which runs a set of balls 13, and said depressions or tracks 10 and 12 forming a ball-race C, containing a set of balls 14. The race C is of smaller diameter than the race B, so that the set of balls 13 may at least partially surround the set 14, thereby conducing to compactness of the joint. The sets of balls work on opposite sides of the lever A and are held thereto by

the hanger-arms, which may be connected by a central tubular or other rivet 15. Such a transverse connector may pass through eyes 16 and 17 in the hanger and eye 18 in the lever.

It is seen that in striking up the lever A to form the two annular depressions or grooves 11 and 12 one within the other, as in Fig. 3, the metal of said lever is corrugated, and hence materially stiffened, thus enabling the use of thin, inexpensive, and easily-worked metal for this part, while the cooperating bearing-surfaces for the balls are struck up on the hanger, forming beads D and E, whereby the hanger is stiffened. At Fig. 6 is illustrated an unfolded hanger-blank 7<sup>a</sup>. The hanger is firmly supported on the lever, and the entire construction is simple, durable, and inexpensive and may be employed upon low-priced suspenders.

Variations and changes may be resorted to without departing from the invention.

I claim as my invention—

1. A joint for a garment-supporter, comprising two sheet-metal members, one of said members having upon its opposite sides annular tracks, and the other of said members forking the first-mentioned member and having corresponding annular tracks and sets of balls in the races formed by said tracks.

2. A joint for a garment-supporter, comprising a lever and a hanger, one of said parts having upon its opposite sides struck-up annular tracks, and the other of said parts forking the first-mentioned part and having corresponding annular tracks, and a set of balls in each of the races formed by said tracks, the diameter of one of said races being smaller than the diameter of the other thereof.

3. A joint for a garment-supporter, comprising a lever and a hanger, one of said members having upon its opposite sides struck-up annular tracks, and the other of said members forking the first-mentioned member and having corresponding annular tracks, a set of balls in each of the races formed by the cooperation of said tracks, and a transverse connector for the arms of said forked member.

4. A joint for a garment-supporter, comprising a lever and a hanger, said lever consisting of a single plate and having portions



of two ball-races, and said hanger having two arms or plates, upon which are provided the remaining portions of said ball-races, and a set of balls in each of said races.

5 5. A joint for a garment-supporter, comprising a sheet-metal lever and a sheet-metal hanger, said lever having upon its opposite sides struck-up annular tracks, and said hanger inclosing said lever and having corresponding annular tracks, which cooperate with said lever-tracks to form races, and a set of balls in each of said races.

15 6. A joint for a garment-supporter, comprising a lever and a hanger, said lever having annular tracks, and said hanger forking said lever and having corresponding annular tracks which cooperate with said lever-tracks to form races, and a set of balls in each of said races; the diameter of one of said races being smaller than that of the other, and one set of balls at least partially surrounding the other set.

25 7. A joint for a garment-supporter, comprising a lever and a hanger, said lever having upon its opposite sides struck-up annular tracks, and said hanger forking said lever and having corresponding annular tracks, which cooperate with said lever-tracks to form races, a set of balls in each of said races, and a central transverse connector for said hanger.

35 8. A joint for a garment-supporter, comprising a lever and a hanger, one of said parts consisting of a single plate of sheet metal and having portions of two ball-races, and the other of said parts consisting of a double plate of sheet metal forking said single plate and having the remaining portions of said

ball-races; and a set of balls in each of said races. 40

9. A joint for a garment-supporter, comprising a lever and a hanger, said lever consisting of a single plate and having struck-up portions of two ball-races, said hanger having two arms or plates upon which are struck up the remaining portions of said ball-races; and a set of balls in each of said races; one of said races being of larger diameter than the other. 45

10. A joint for a garment-supporter, comprising a lever and a hanger, said lever consisting of a single plate and having struck-up portions of two ball-races and said hanger having two arms or plates, upon which are struck up the remaining portions of said ball-races; and a set of balls in each of said races; one of said races being of larger diameter and at least partially inclosing the other. 50 55

11. A metallic suspender-fitting comprising a lever having an annular depression and an eye, and also a second annular depression surrounding said eye; a hanger forming a loop one arm whereof has an annular depression to match the depression in said lever thereby to form a raceway, and the other arm of said loop having an annular depression of smaller diameter which cooperates with the second depression to form a second raceway having a smaller diameter than the first-mentioned raceway; a set of balls in each of said raceways; and a transverse connector for holding said arms together. 60 65 70

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Witnesses:

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