

No. 825,781.

PATENTED JULY 10, 1906.

J. H. WALKER.  
TROLLEY.

APPLICATION FILED SEPT. 9, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

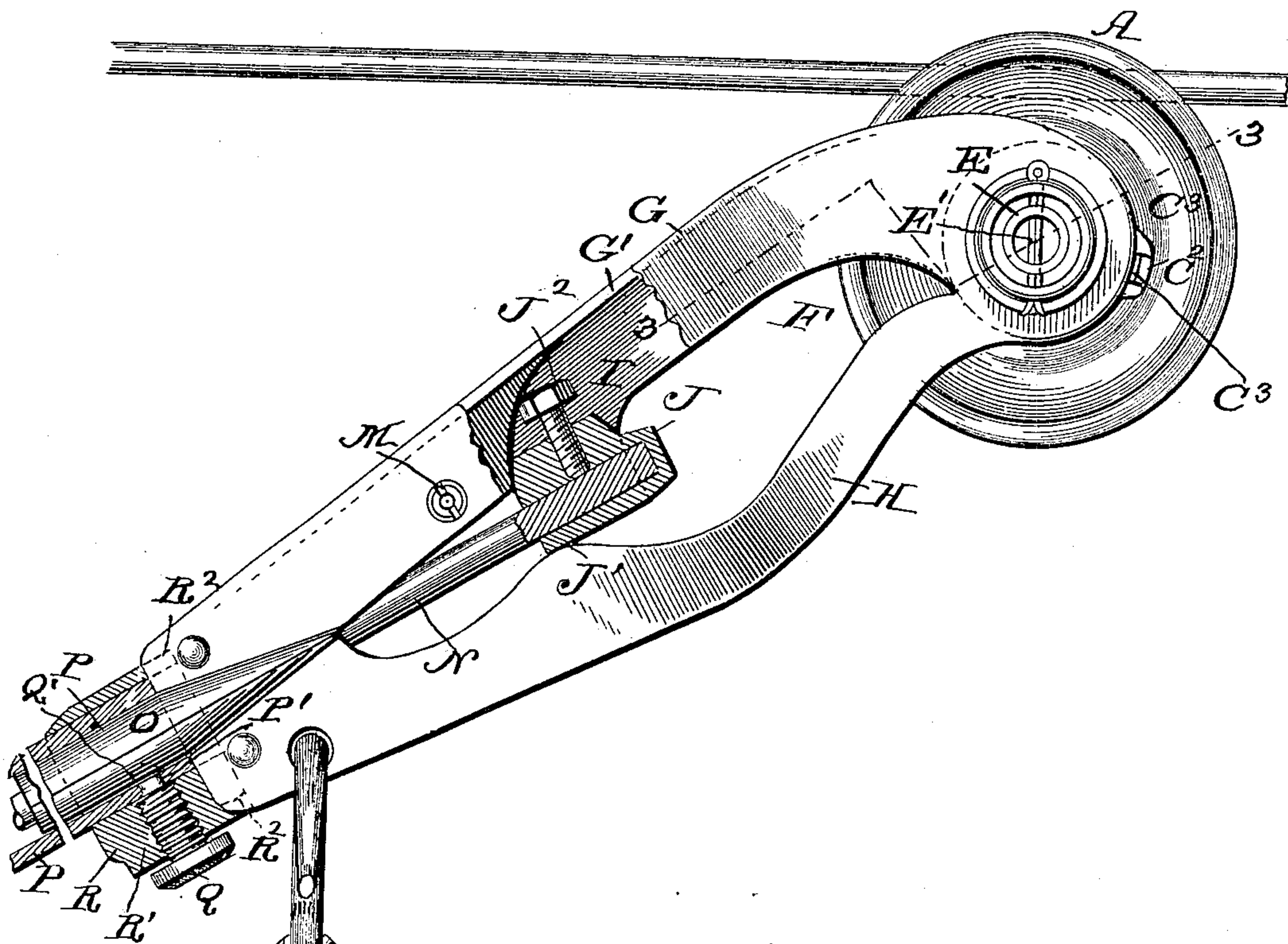
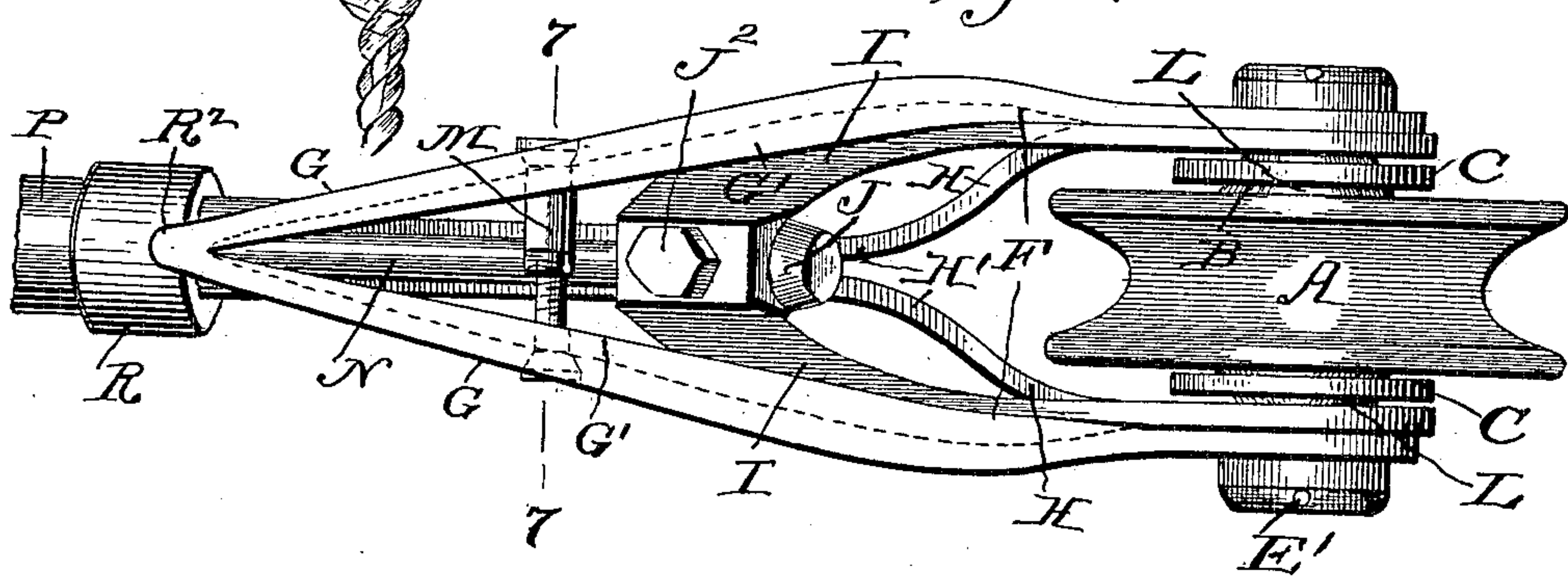


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

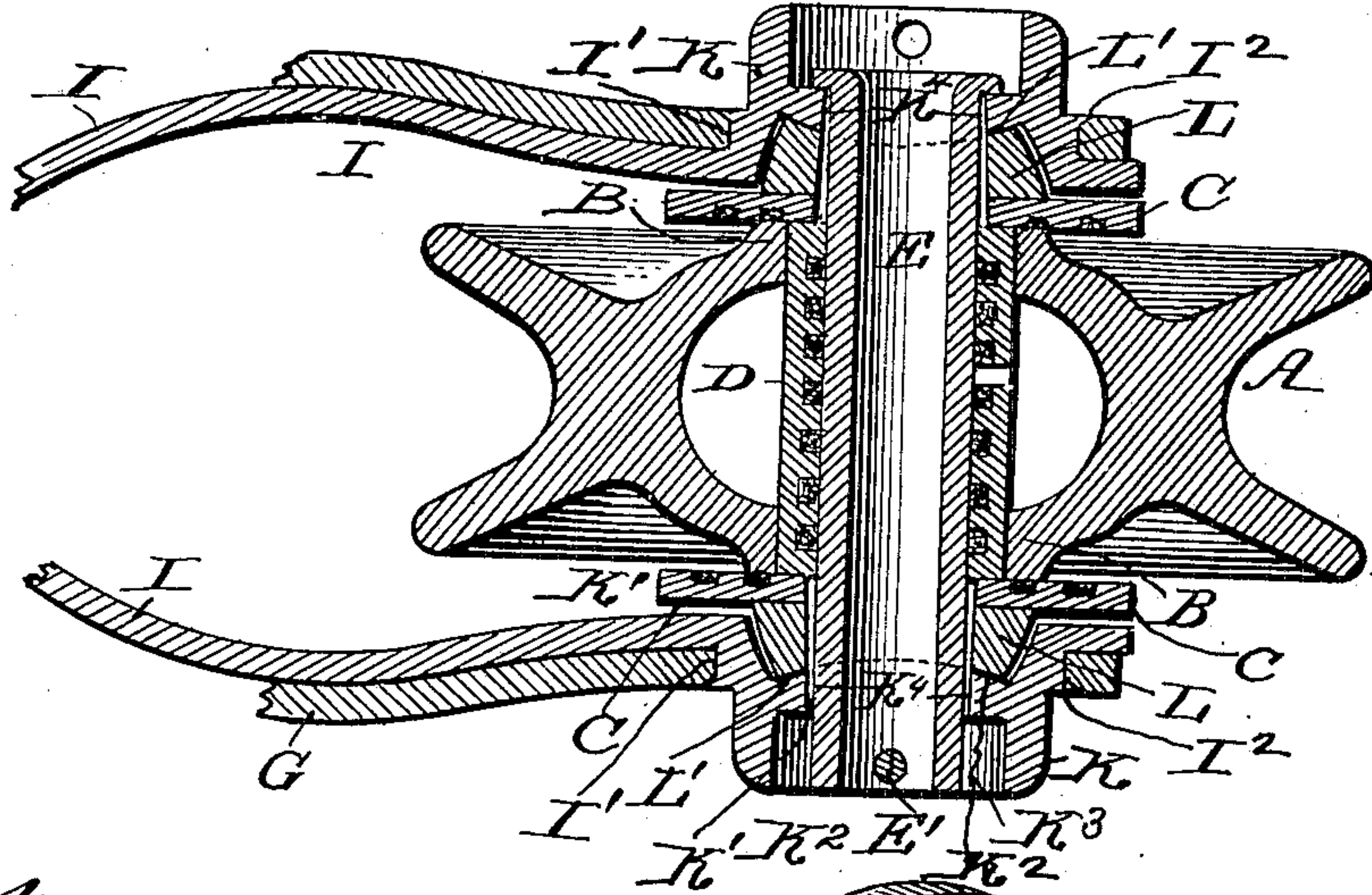


Fig. 4.

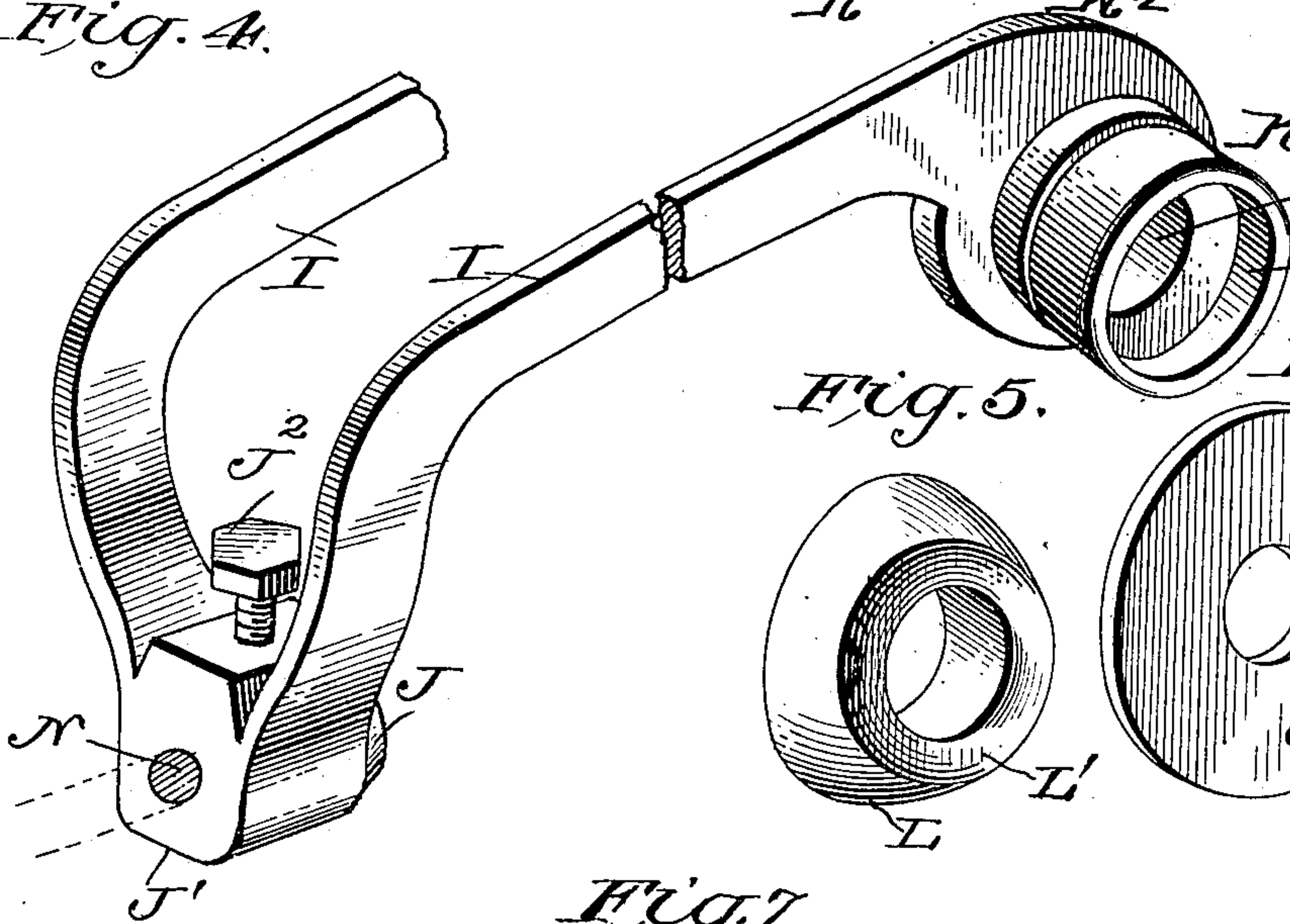


Fig. 5.

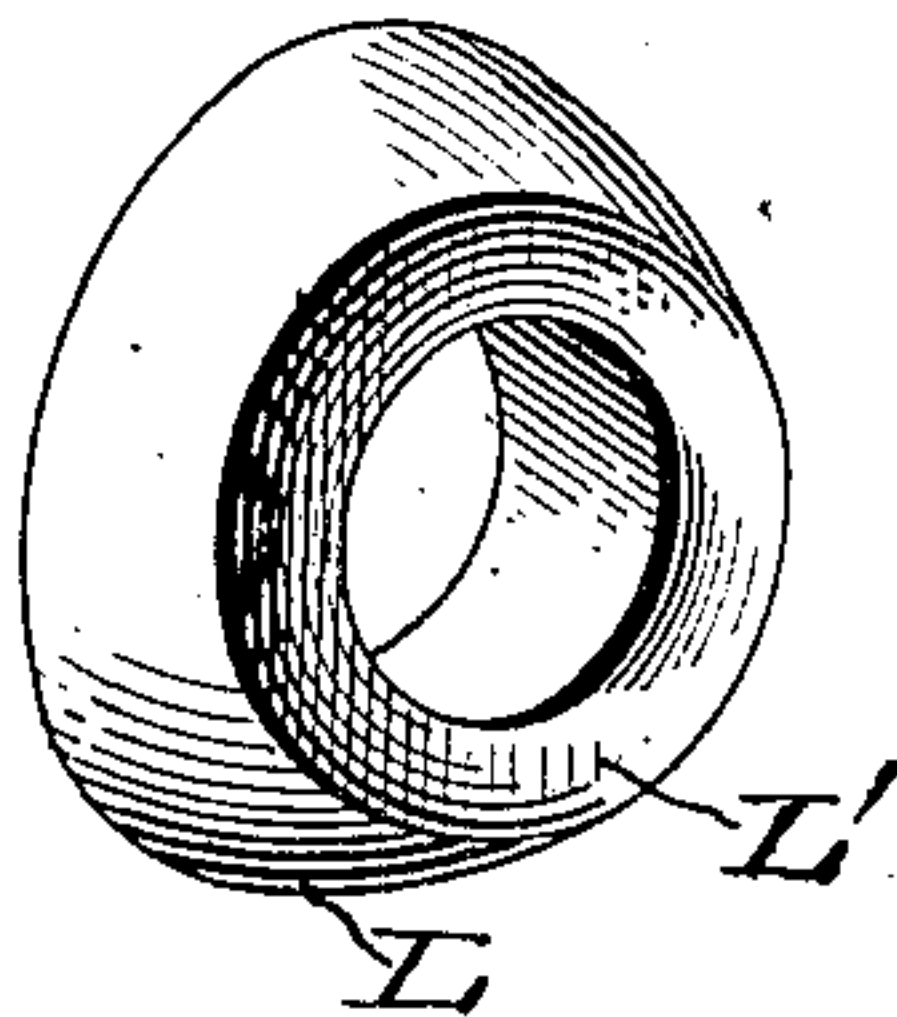


Fig. 6.

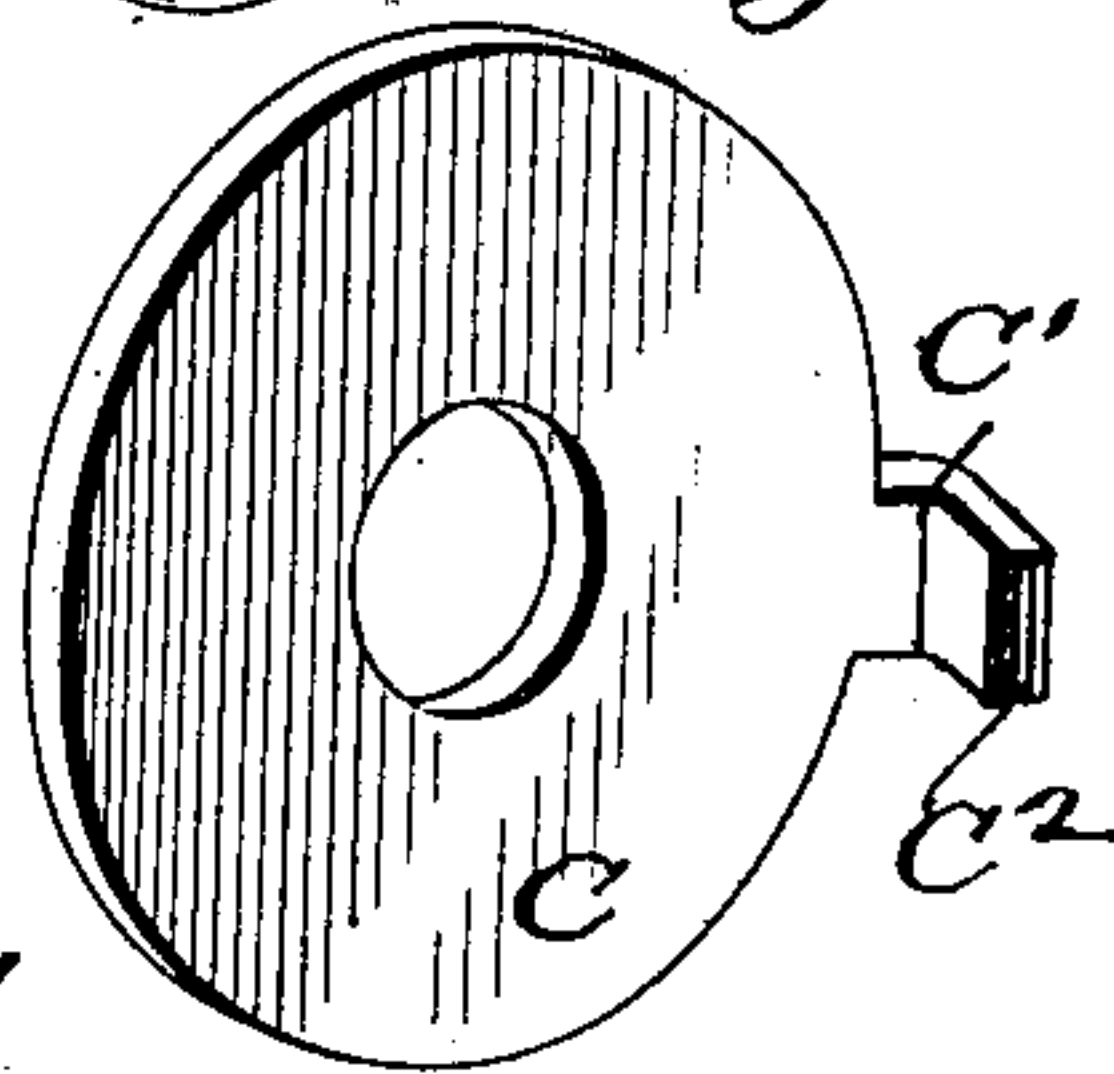
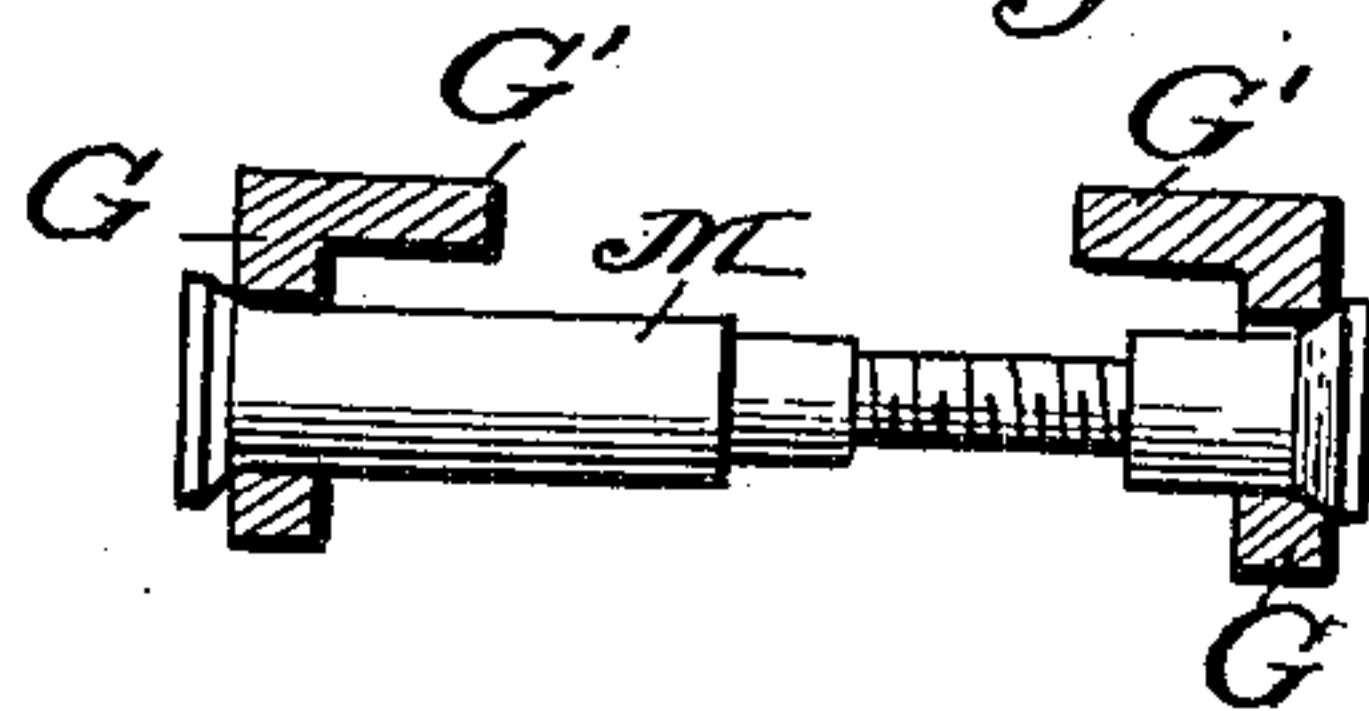


Fig. 7.



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# UNITED STATES PATENT OFFICE.

JOHN H. WALKER, OF LEXINGTON, KENTUCKY.

## TROLLEY.

No. 825,781.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed September 9, 1905. Serial No. 277,678.

*To all whom it may concern:*

Be it known that I, JOHN H. WALKER, a citizen of the United States, and a resident of Lexington, in the county of Fayette and State of Kentucky, have invented certain new and useful Improvements in Trolleys, of which the following is a specification.

My invention is an improvement in trolleys; and it consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation, partly broken away and partly in section, of a trolley embodying my invention. Fig. 2 is a top plan view thereof. Fig. 3 is a detail section on about line 3 3 of Fig. 1. Fig. 4 is a detail perspective view, partly broken away, of the conduit-leads. Fig. 5 is a detail perspective view of one of the rockers. Fig. 6 is a detail perspective view of one of the washers, and Fig. 7 is a detail cross-section on about line 7 7 of Fig. 2.

The wheel A may be of ordinary construction, having the hub B bearing at its ends against the washers C and having the central lubricating-tube D mounted on the shaft E, which latter is secured within the harp and preferably in bosses extending from the conduit-leads, as presently described.

The harp F has the upper prongs or branches G, provided at their upper edges with the inwardly-projecting stiffening-flanges G', and the lower prongs or branches H, the latter curved inwardly toward a point H', where they form a support for the terminal, presently described, as will be understood from Figs. 1 and 2 of the drawings. The harp is provided with the conduit-leads I, which merge at their lower ends in the terminal J and are provided at their upper ends with the outwardly-extending bosses K, fitting in openings I' in the upper prongs G and riveted at I<sup>2</sup> therein, forming a rigid union with the harp-prongs G and constituting practically a part of the harp, as will be understood from Figs. 1, 2, and 3 of the drawings. These bosses K are provided in their inner faces with circular recesses K', having their inner walls K<sup>2</sup> rounded or convex, as best shown in Fig. 3, and they are also provided in their outer faces with recesses K<sup>3</sup>, receiving at one end the head of the shaft E

and at the other end the pin E' for securing said shaft. The leads I are preferably of cast-copper and when riveted in the apertures in the harp-prongs are held securely to the latter, with the conduit-leads pressed closely to the flat surfaces of the harp-prongs G at the upper ends of the same and with said conduit-leads extending downwardly under the stiffening-flanges G', which operate to protect the conduit-leads from any rough usage to which the harp may be subjected. These leads support at their lower ends the terminal J, which rests at J' on the apex of the lower prongs H, so that the leads I will be securely held between the flanges G' of the upper prongs and the upper edges of the lower prongs, which will prevent the boss projections of the leads from working loose in the apertures formed in the trolley-harp. The openings K<sup>4</sup> through the boss projections for the wheel-shaft are tapered or enlarged, as best shown in Fig. 3, to permit the desired movements of the trolley-wheel in the use of the device.

Rockers L (shown in detail in Fig. 5) have tapered openings fitting over the shaft E, and these rockers fit within the recesses K' in the bosses K and are concave in their outer ends at L' to fit the convex base-wall of the recess K' when the parts are assembled, as shown in Fig. 3. This construction permits of a knuckle-joint movement of the trolley-wheel and provides for the even and uniform wear of the parts in the practical use of the invention.

Washers C fit over the shaft E and operate between the ends of the hub B and the rockers L and are preferably made of such diameter (see Fig. 3) as to form a bearing for any desired size of hub. These washers are held from turning with the wheel by means of lugs C', having outwardly-deflected branches C<sup>2</sup>, entering notches C<sup>3</sup> in the conduit-leads, as shown in Fig. 1. The rocking knuckle-joint construction permits of the concave part of the rocker moving in any direction after the wheel-shaft has been inserted through the tapered apertures, thus securing a uniform contact-surface between the opposing concave and convex surfaces and securing a complete and perfect fitting of the washers against the ends of the wheel-hub, overcoming



ing any imperfections or uneven pressure on the prongs of the harp, because of the elasticity or resilience of the harp-prongs, or of the adjustment of the same by the connecting-bolts. (Shown at M in Figs. 2 and 7 of the drawings.) This construction also permits of an accurate tight fitting of the parts in such manner as to secure the maximum wear of the parts and efficiently retains the lubricating-oil in the hub of the trolley-wheel until consumed. The resilience of the harp-prongs may be adjusted by the connecting-bolts from time to time in such manner as to regulate the tension, so the points of contact may be maintained at all times until the trolley is entirely worn out.

The conduit-wire N fits at its upper end in the terminal J and is secured by the set-screw J<sup>2</sup>. This wire N extends down through the tubular shank O of the harp and thence through the hollow trolley-pole P to the parts with which it connects, as is well understood. The shank O fits within the upper end of the tubular pole P and is secured by the screw Q, in connection with the reinforcing-band R, the latter fitting over the pole P, having a thickened bearing at R' for the screw Q and the latter having its point portion Q' passing through an opening P' in the pole P and also through the shank O. This reinforcing-band R can be of wrought or malleable iron or other suitable material, is notched in its upper end at R<sup>2</sup> to receive the lower ends of the upper and lower prongs of the harp, (see Figs 1 and 2,) and provides a simple and efficient means for securing the harp upon the upper end of the pole. By the use of this band, with the set-screw, as described, much time is saved in applying the trolley-harp to and detaching it from the upper end of the pole, and it avoids the difficulties resulting from the splitting of the upper end of the trolley-pole and enables me to secure a firm rigid connection between the pole and harp, as is desired.

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

1. The combination substantially as herein described, of the harp, having the upper prongs provided with the inwardly-projecting stiffening-flanges, and the lower prongs inclining inwardly toward each other below the upper prongs, the conduit-leads held at their upper ends to the harp and extending thence downwardly and fitting against the inner sides of the upper prongs beneath the stiffening-flanges and merging at their lower ends in a terminal resting upon the lower prongs, the said conduit-leads being provided at their upper ends with bosses fitting within openings in the harp, and provided in their inner faces with recesses, the wheel and its

shaft and rockers fitting on the shaft and within the recesses in the conduit-leads, the abutting faces of the rockers and the base-walls of said recesses being concavo-convex, all substantially as and for the purposes set forth.

2. The combination of the harp provided with apertures, the conduit-leads having bosses held in the said apertures of the harp, and provided with bearings for the wheel-shaft, and the wheel and its shaft, substantially as set forth.

3. The combination of the harp, provided with apertures, the conduit-leads having bosses fitting and held in said apertures and provided in their inner faces with recesses, the base-walls of which are provided with openings for a shaft, the wheel having its shaft fitting in said openings, the washers abutting against the ends of the wheel, and the rockers in the said recesses and bearing between the base-walls thereof and the said washers, substantially as set forth.

4. The combination of the harp having the upper prongs provided with inwardly-projecting stiffening-flanges, and with the lower prongs extending below said upper prongs, the conduit-leads held at their upper ends to the harp and extending downwardly beneath the stiffening-flanges of the upper prongs, and provided at their lower ends with the terminal supported upon the lower prongs, substantially as set forth.

5. The combination of the harp having upper and lower prongs, and the conduit-leads extending alongside the upper prongs and braced against upward movement by said upper prongs and against downward movement by the lower prongs, substantially as set forth.

6. A trolley-harp having upper and lower prongs and conduit-leads extending beneath the lower and upper prongs, the upper prongs having portions overlying the conduit-leads, and the lower prongs having portions underlying the said leads, substantially as set forth.

7. The combination of the harp having the upper prongs provided with the inwardly-projecting stiffening-flanges, and the lower prongs inclining inwardly toward their lower ends below the said upper prongs, and the conduit-leads extending alongside the upper prongs and bearing beneath the stiffening-flanges and provided at their lower ends with the terminal resting upon the lower prongs.

8. The combination of the harp having opposite apertures, the conduit-leads having bosses fitting in the opposite apertures, and provided in the inner faces of said bosses with recesses, the rockers fitting in said recesses, the wheel, its shaft held in the said bosses of the leads, and extending through the rockers,



and the washers bearing between the rockers and the wheel-hub.

9. The combination with the harp having openings and the conduit-leads having bosses  
5 fitting in said openings, and the wheel and its shaft supported in said bosses, of means on the harp for preventing upward and down-

ward movement of the leads, whereby to prevent any rotation of the bosses within the openings in the harp.

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Witnesses:

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