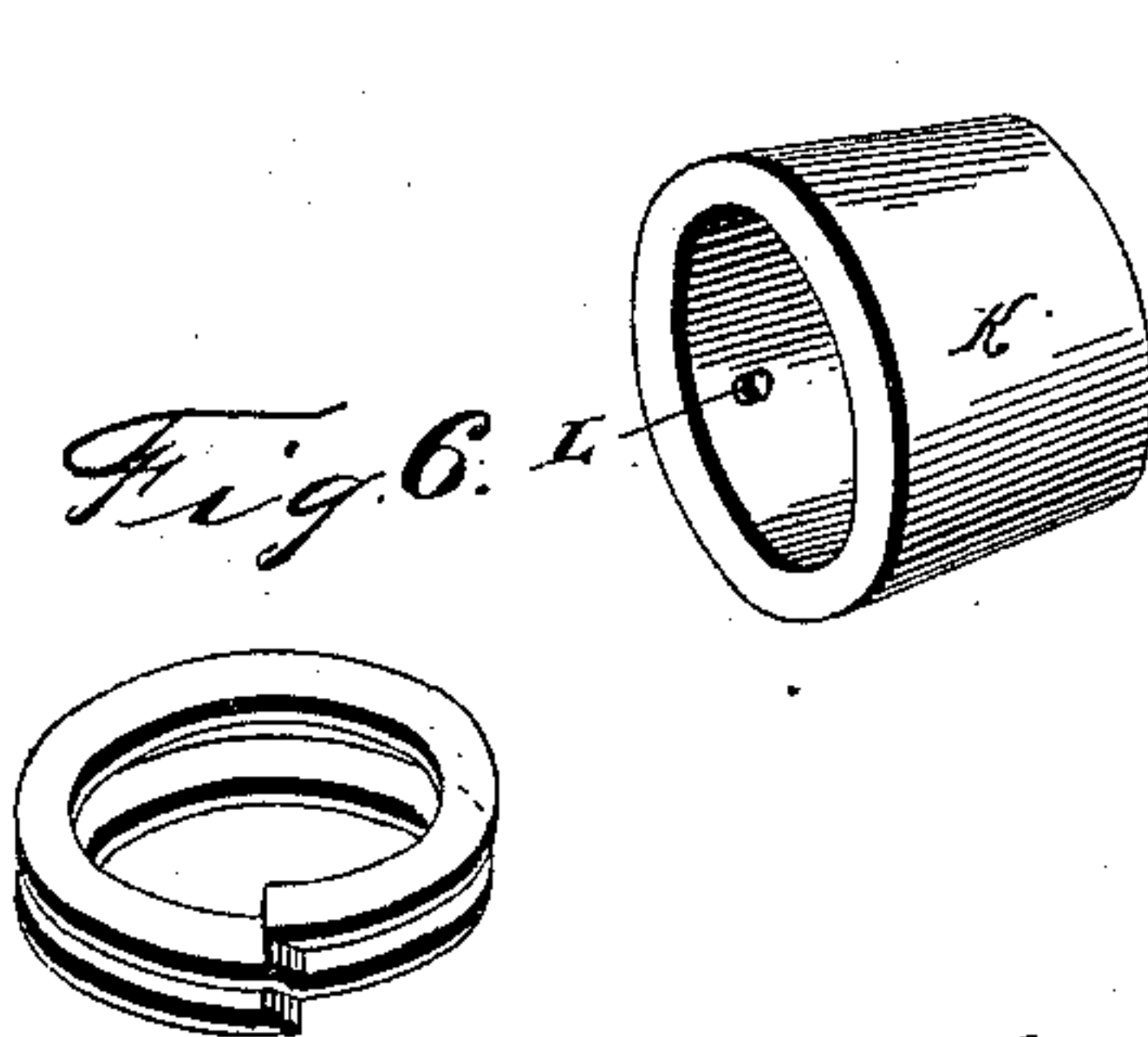
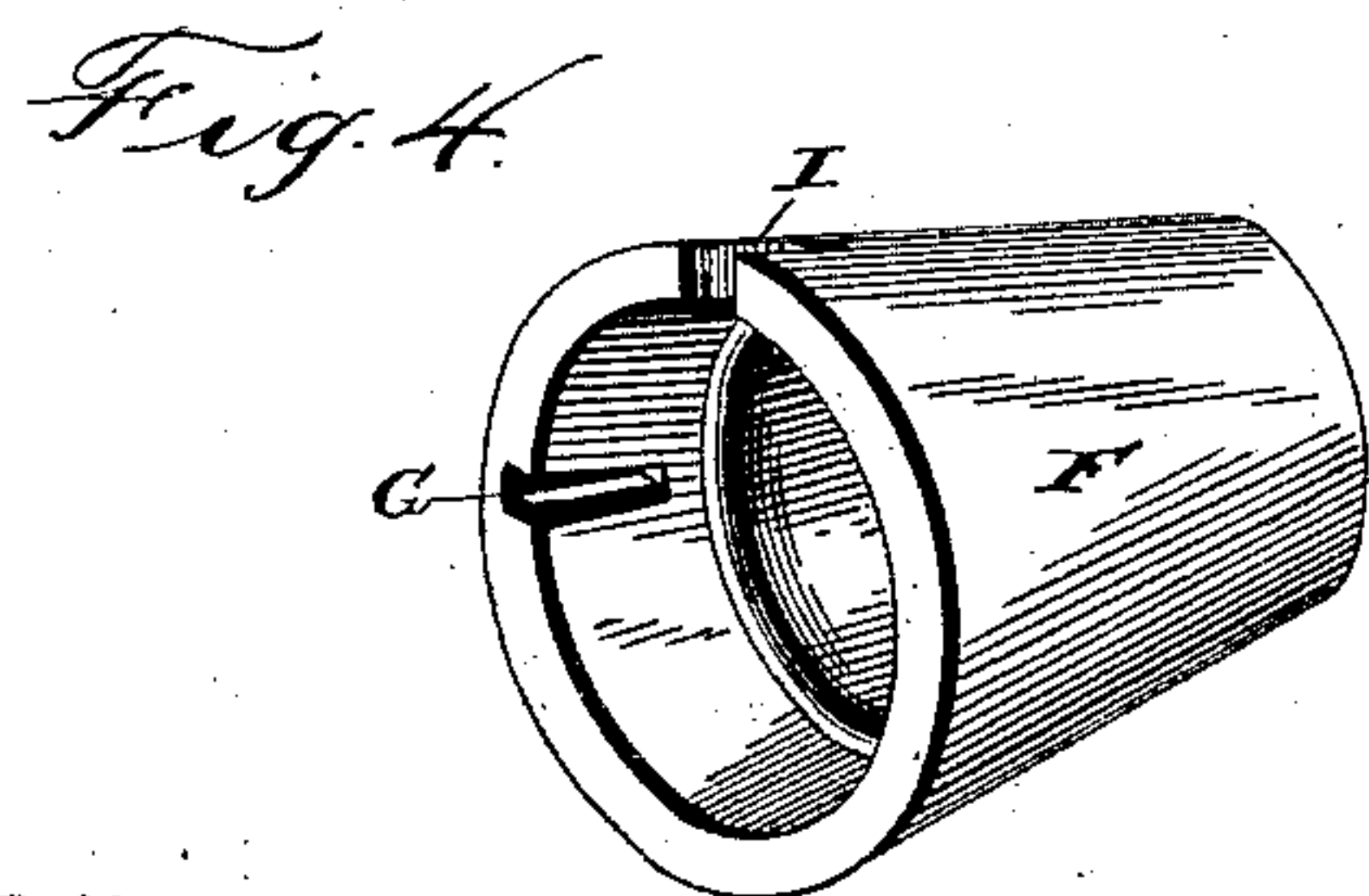
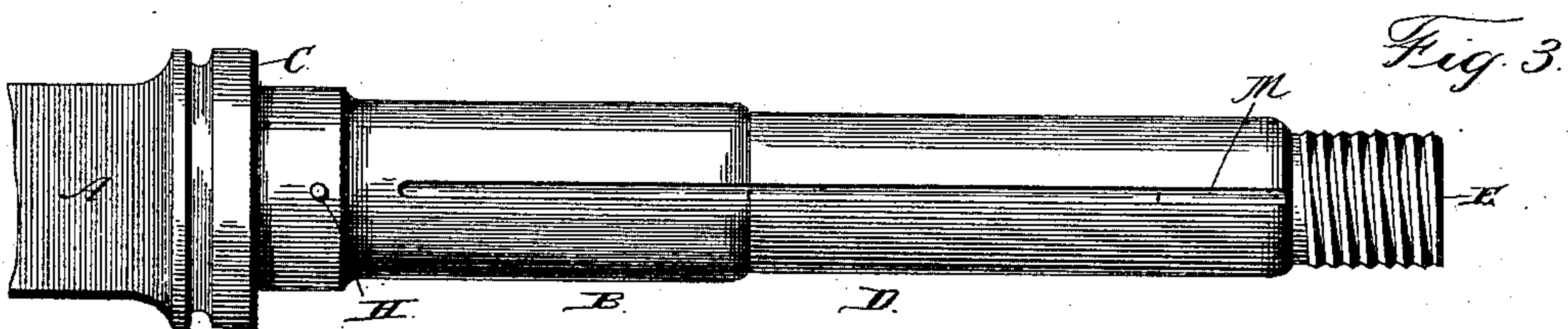
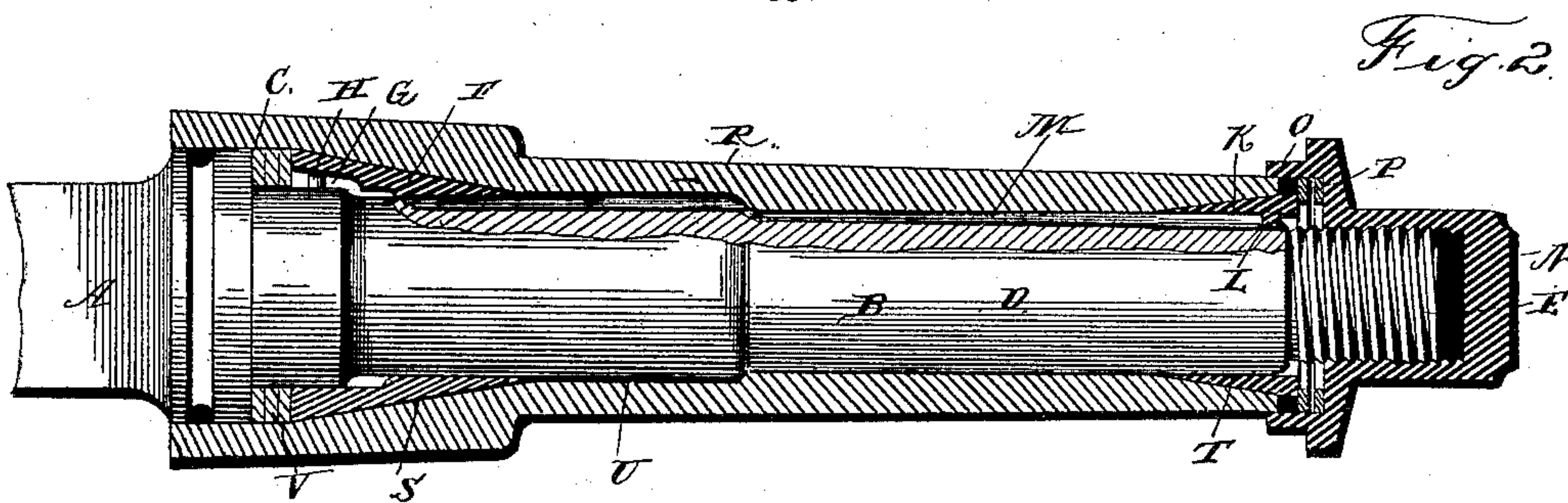
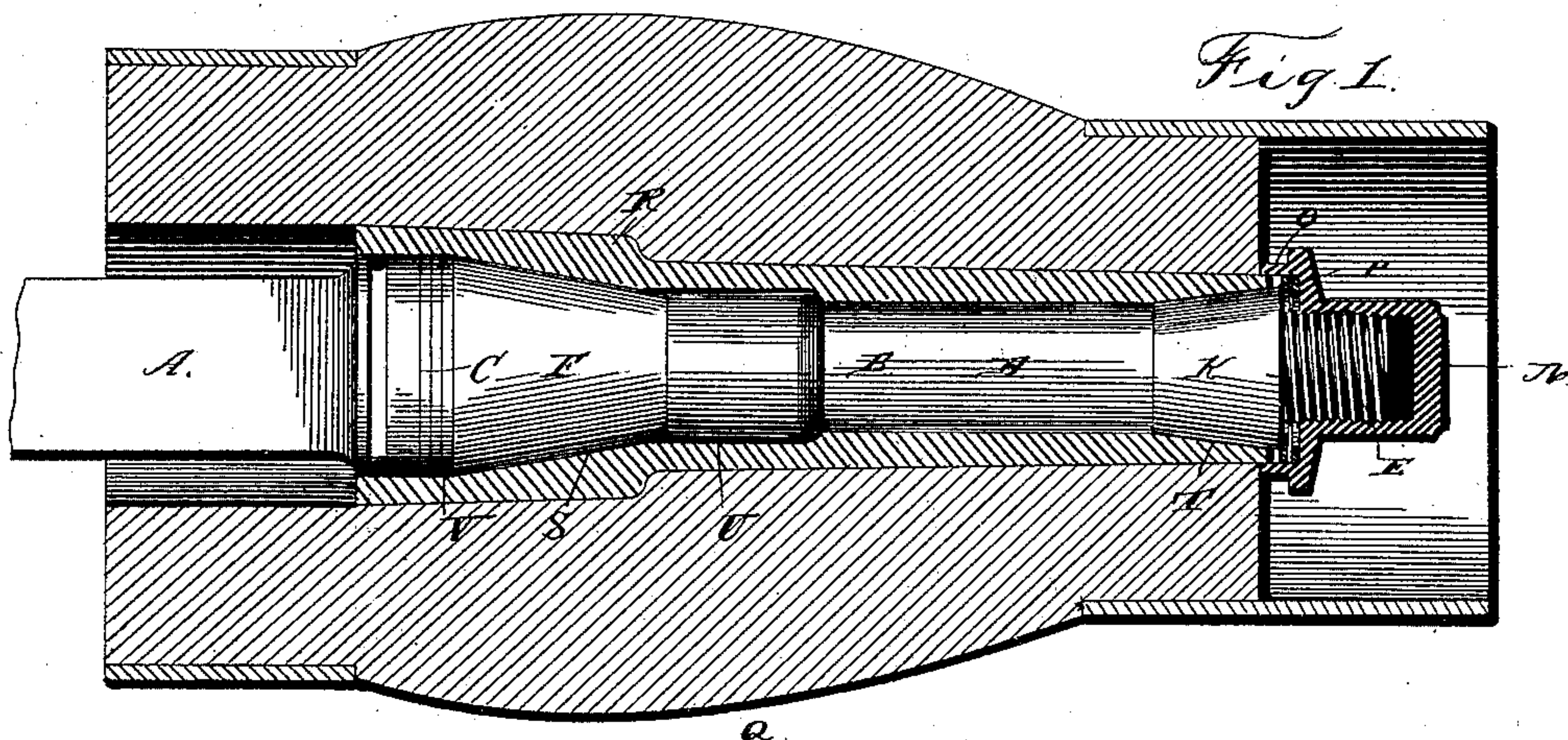


(No Model.)

D. E. HULL.
AXLE BEARING.

No. 387,719.

Patented Aug. 14, 1888.



Witnesses,
Geo. Thayer
C. E. Doyle

Inventor,
Daniel E. Hull.

By his Attorneys
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

DANIEL E. HULL, OF ADRIAN, MICHIGAN.

AXLE-BEARING.

SPECIFICATION forming part of Letters Patent No. 387,719, dated August 14, 1888.

Application filed February 16, 1888. Serial No. 264,191. (No model.)

To all whom it may concern:

Be it known that I, DANIEL E. HULL, a citizen of the United States, residing at Adrian, in the county of Lenawee and State of Michigan, have invented a new and useful Improvement in Axle-Bearings, of which the following is a specification.

My invention relates to improvements in axle-bearings; and it has for its object to provide improved means for taking up the wear on the spindle and the box and to provide improved means for lubricating the spindle throughout its length.

With these objects in view the invention consists in a certain novel construction and combination of devices, which is hereinafter more fully set forth in connection with the accompanying drawings, wherein—

Figure 1 is a side view of the spindle and the adjusting-cones, with the axle-box and hub shown in section. Fig. 2 is a similar view showing the spindle and cones in section. Fig. 3 is a side view of the spindle in another position to show more clearly the guide-grooves and the oil-grooves therein, as hereinafter described. Fig. 4 is a detached perspective view of the inner or larger cone. Fig. 5 is a similar view of the outer or smaller cone. Fig. 6 is a detail view of the spring-washer.

Referring by letter to the drawings, A designates a portion of the axle having a spindle, B, on the end, and C designates a shoulder, which is located at the inner end of the said spindle. The outer portion of the spindle is reduced, as seen at D, for a purpose to be hereinafter described, and the extremity of the same is screw-threaded, as seen at E, to receive an axle-nut.

F designates the inner and larger cone, which is hollow and fits and slides on the spindle, and is adapted to bear at its inner or abrupt end against the shoulder C. The cone is provided at its inner end with the interior longitudinal slot or groove, G, which fits and slides on a stud or projection, H, on the spindle; or the cone may be provided with the inward-extending stud or projection engaging in a groove or slot in the side of the spindle. It will be seen, however, that in either case the cone will be capable of unlimited longitudinal movement; but it is locked against axial motion on the

spindle. A notch, I, is formed in the outer end of the cone to enable a tool to be applied to remove it from the spindle.

K represents the outer cone, which also slides loosely on the spindle and is provided with an interior stud or projection, L, which engages in a groove, M, in the side of the spindle.

N represents an axle-nut which screws on the end of the spindle, and it is provided with an inward-extending flange, O, which projects over the outer end of the cone K. A spring-washer, P, of steel, brass, or other suitable material is arranged within the flange O, and it bears against the outer end of the cone K. Therefore the said spring-washer exerts a constant pressure upon the cone to force it inward, and to increase the tension of the spring it is simply necessary to further screw the nut N on the spindle.

Q represents the hub of a wheel, in which is removably disposed the axle-box R. The said box fits the above-mentioned reduced portion of the spindle and is also provided at its ends with the cone-shaped bearings S T to fit the cones F K respectively. An oil-space, U, is formed between the larger portion of the spindle and the axle-box to contain the oil and hold it in reserve, so that it may gradually work in both directions along the spindle.

In the drawings I show two or more metallic or leather washers, V, between the inner end of the cone F and the shoulder C. This is to illustrate the manner of adjusting the larger cone outward as the bearing wears. Instead of the said washers, however, one of the spring-washers, similar to that hereinbefore mentioned, may be employed. In this case the larger or inner cone will be automatically adjustable, as well as the outer cone. The advantages of this invention will now be apparent. The cones are loosely mounted on the spindle, and are therefore removable therefrom to enable them to be renewed when worn out. The said cones may also be applied to any ordinary axle-spindle when it becomes worn to render it serviceable. Either or both of the cones are adjustable. The cones are not capable of rotation on the spindle, and therefore there can be no tightening or cramping of the bearing when the wheel is backed, as there may be when the cones are held in place by

ordinary set-screws; and the spring washer or washers (if two are used) exert a constant pressure upon the cones to keep them tightly pressed into the bearings of the axle-box, thus preventing all rattling. Owing to the action of these spring-washers, one adjustment of the wheel by means of the nuts will be sufficient to maintain the bearing tight for a considerable length of time, as all the wear will be automatically compensated for.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination, with a spindle having a cone on its inner end and a movable or adjustable cone on its outer end, of the spring-washer bearing against the outer cone and the nut screwed on the outer threaded end of the spindle and having an annular inward-extending flange, O, embracing and concealing the said spring-washer, substantially as and for the purpose specified.

2. The combination, with a spindle having a reduced portion, D, the oil-groove M, and cones on the opposite ends of the spindle, of the box mounted on the spindle and bearing

on the cones and the said reduced portion, and having oil-space U, surrounding the spindle at an intermediate point, substantially as specified.

3. In a bearing, the combination of the spindle B, having the shoulder C at its inner end and a reduced portion, D, the longitudinally-movable cone F on the inner end of the spindle and held from rotary motion, substantially as specified, the longitudinally-movable cone K on the outer end of the spindle and held from rotary motion, the nut screwed on the end of the spindle and having the inward-extending flange O, the spring-washer inclosed within the said flange and bearing against the outer end of the cone K, and the box mounted on the spindle and cones and having an oil-space, U, formed therein around the spindle, substantially as and for the purpose specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

DANIEL E. HULL.

Witnesses:

WM. B. THOMPSON,
E. N. SMITH.