(No Model.)

J. STEVENS.

CALIPERS OR DIVIDERS.

No. 377,868. Patented Feb. 14, 1888.

Fig. 1,

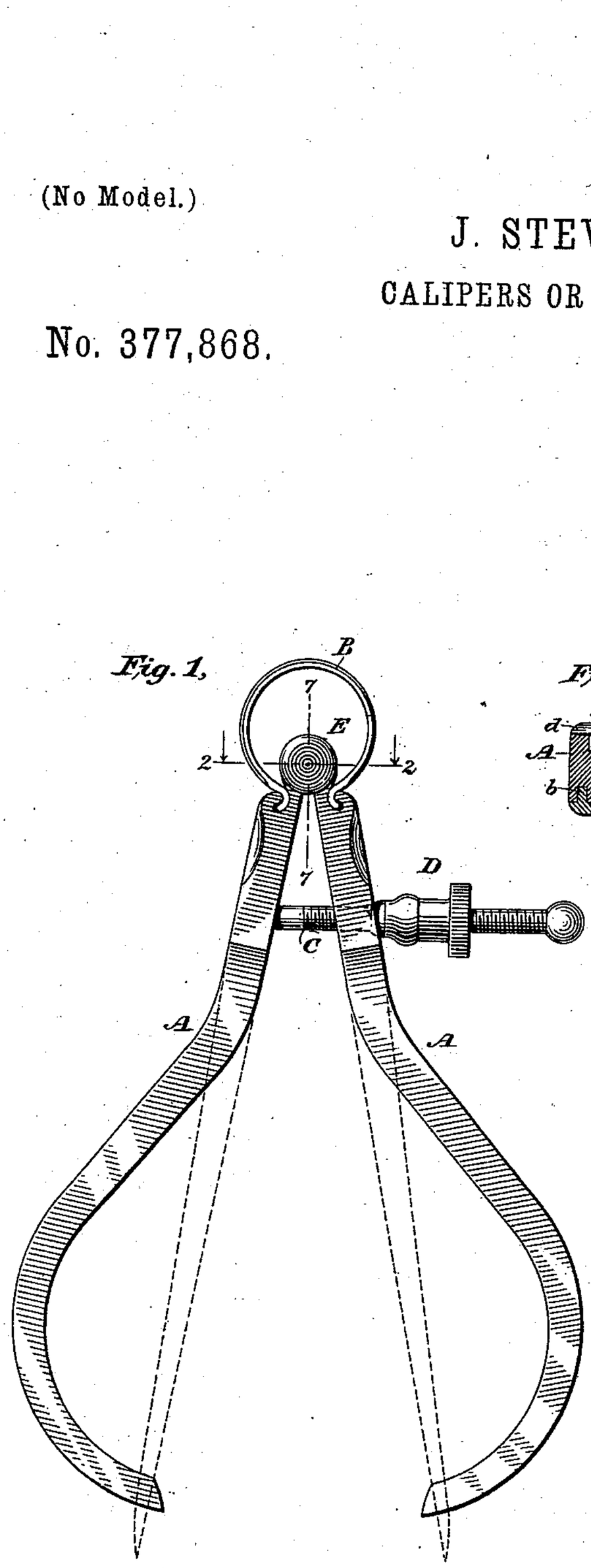


Fig. 2,

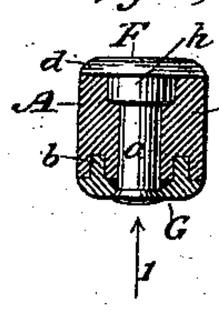


Fig. 3,

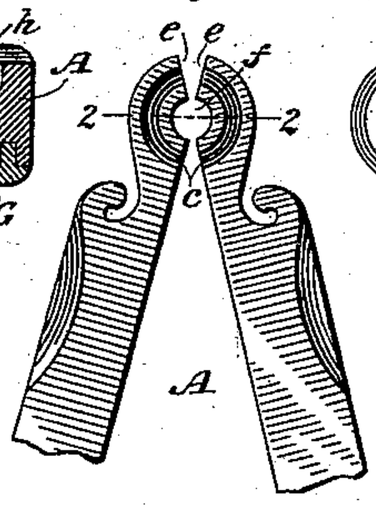


Fig. 4,

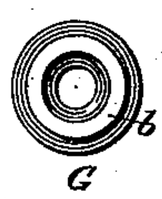


Fig. 5,

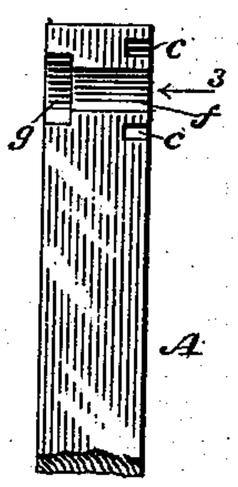


Fig. 7,

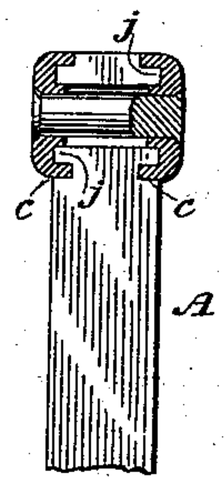


Fig. 8,

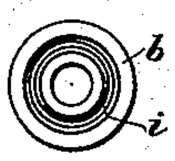
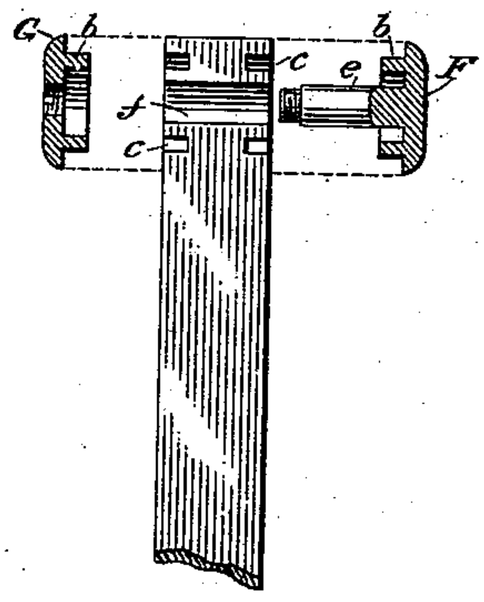


Fig. 6,



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INVENTOR:

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By his Attorneys,

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UNITED STATES PATENT OFFICE.

JOSHUA STEVENS, OF CHICOPEE FALLS, MASSACHUSETTS, ASSIGNOR TO THE J. STEVENS ARMS AND TOOL COMPANY, OF SAME PLACE.

CALIPERS OR DIVIDERS.

SPECIFICATION forming part of Letters Patent No. 377,868, dated February 14, 1888.

Application filed September 9, 1887. Serial No. 249,223. (No model.)

To all whom it may concern:

Be it known that I, JOSHUA STEVENS, a citizen of the United States, residing in Chicopee Falls, Hampden county, Massachusetts, have invented certain new and useful Improvements in Calipers, Dividers, &c., of which the following is a specification.

This invention relates to the head or hinged joint for calipers, dividers, compasses, and similar instruments. Instead of the two legs being interleaved at the hinge with a pintle, screw, or rivet passed through their respective perforated eyes, they are constructed according to my invention with the hinge part of each leg entirely on one side of the pintle and connected together through the medium of a washer or cap applied to one or both sides and having a concentric annular rib entering grooves in the hinge parts of the respective legs, whereby the latter are retained in position and caused to turn properly around the pintle.

Figure 1 of the accompanying drawings is a side view showing calipers constructed according to my invention. In dotted lines are shown the legs of dividers to illustrate the applicability of my invention thereto. The remaining views are on an enlarged scale. Fig. 2 is a transverse section of the head or hinge, cut along the line 2 2. Fig. 3 is a fragmentary view showing the upper ends of the legs brought together as they are when the hinge is completed. Fig. 4 is a plan of the annularly-ribbed washer. Fig. 5 is an elevation of the inner side of one of the legs. Fig. 6 illustrates a modification, being a view like Fig. 5, with the addition of the respective annular washers to be applied to it shown in diametrical section. Fig. 7 is a section on the line 7 7 in Fig. 1, showing another modification; and Fig. 8 is a plan of one of the washers used in Fig. 7.

Let A A designate the legs of the calipers or dividers; B, the usual spring for opening the legs; C, the screw and D the nut for closing them together, and E the hinge. With the exception of the hinge, the construction is the same as that heretofore known.

I will first describe the construction of hinge or head shown in Figs. 2 to 5.

The hinge end or head of each leg A is formed entirely on one side of a diametrical plane coincident with the axis of the pintle *a*, as best shown in Fig. 3, and to enable the two legs to be opened out to the desired angle their upper ends above the pintle are beveled back, as shown at *e e* in Fig. 3. In each leg is formed a nearly half-round cylindrical groove, *f*, for the reception of the pintle. The legs are formed on one side of the head with a recess, *g*, to receive a boss, *h*, on the head F of the pintle, and on the other side of the head the legs are formed with an annular groove, *c*, concentric with the axis of the pintle, as shown in Figs. 3 and 5. The washer G, which fits against this side of the head, has a concentric annular rib, *b*, which enters the grooves *c* in the manner shown in Fig. 2, and thereby connects together the two legs and prevents their separation or movement away from each other, while at the same time permitting them to turn the one upon the other to the extent provided for by the beveling away of the ends *e*. The head F and washer G upon opposite sides of the head are connected together through the medium of the pintle *a*, which is made in one piece with the head, and the opposite end of which passes through the hole in the center of the washer and is riveted down thereon. The parts being accurately fitted together, a very perfect hinge-joint is thus made, it being to the least degree possible subject to wear and not liable to become loose. In case it wears loose to a slight extent it may be tightened again by hammering down the riveted end of the pintle, and this is done without liability of injuring the hinge, as in the case of an interleaved hinge.

When the legs are closed together, an angular gap is left between the beveled faces *e e* at the top; but this gap is concealed and protected by the broad plate-spring B, which entirely incloses the head.

If preferred, the head F may be made also with an annular rib, *b*, in lieu of its boss *h*, as shown in Fig. 6. This figure also shows the end of the pintle *e* screw-threaded, in order to be united to the washer G by screwing it thereinto instead of riveting it. In this case both the head and washer should be nicked to be engaged by a screw-driver.

While I consider it preferable to make the

head F and pintle *e* both in one piece, this is not essential, as the pintle may be screwed or riveted to the head F, as well as to the washer G. Such a construction is shown in Figs. 7 and 8, which also illustrate a modification wherein the grooves *c c* in the respective legs become mere annular rabbets around the exterior of the head and the ribs *b* on the washers are arranged at the periphery thereof, so that the washers constitute, in fact, caps which partially inclose the ends of the legs on opposite sides of the head; or, in other words, it may be said that in this modification the elements are reversed, in that an annular groove (lettered *i* in Fig. 8) is formed in the washer and annular ribs or projections (lettered *j j* in Fig. 7) are formed on the legs and fit into these grooves.

The pintle preferably fills the eye formed by the half-round grooves in the respective legs, as in Fig. 2; but this is not essential, as the pintle may be made smaller than these grooves, as shown in Fig. 7.

I claim as my invention the following defined novel features or combinations, substantially as hereinbefore specified, namely:

1. Dividers or calipers the upper ends of the legs of which are formed entirely on opposite sides of a plane coincident with the hinge-axis, and hinged together by means of washers on opposite sides of the head, and interfitting concentric annular ribs and grooves formed on the legs and on one or both of said washers, respectively.

2. Dividers or calipers the upper ends of the legs of which are formed entirely on opposite sides of a plane coincident with the hinge-axis, combined with a pintle passing between them, and heads or washers on opposite sides united by said pintle and constructed with interfitting concentric annular ribs and grooves formed on the legs and on one or both of said washers, respectively.

3. Dividers or calipers the upper ends of the legs of which are formed entirely on opposite sides of a plane coincident with the hinge-axis, and having grooves *c* concentric with said axis, in combination with a washer having an annular rib, *b*, entering said grooves, with a washer or head on the opposite side of the legs, and a pintle passing through from side to side between the legs with its opposite ends fixed to the respective washers.

4. Dividers or calipers consisting of the combination of legs A A, formed with recess *g* on one side and concentric grooves *c* on the other, washer G, formed with rib *b* entering said groove, washer F, coming against the opposite side of the legs and having boss *h* entering said recess *g*, and pintle *a*.

5. Dividers or calipers the upper ends of the legs of which are formed entirely on opposite sides of a plane coincident with the hinge-axis, cut away at *e e*, and hinged together by means of washers on opposite sides of the head, and interfitting concentric annular ribs and grooves formed on the legs and on one or both of said washers, respectively, and combined with a cylindrically-curved leaf-spring arranged to inclose the head.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSHUA STEVENS.

Witnesses:
GEO. H. NETTLETON,
F. J. WARNER.