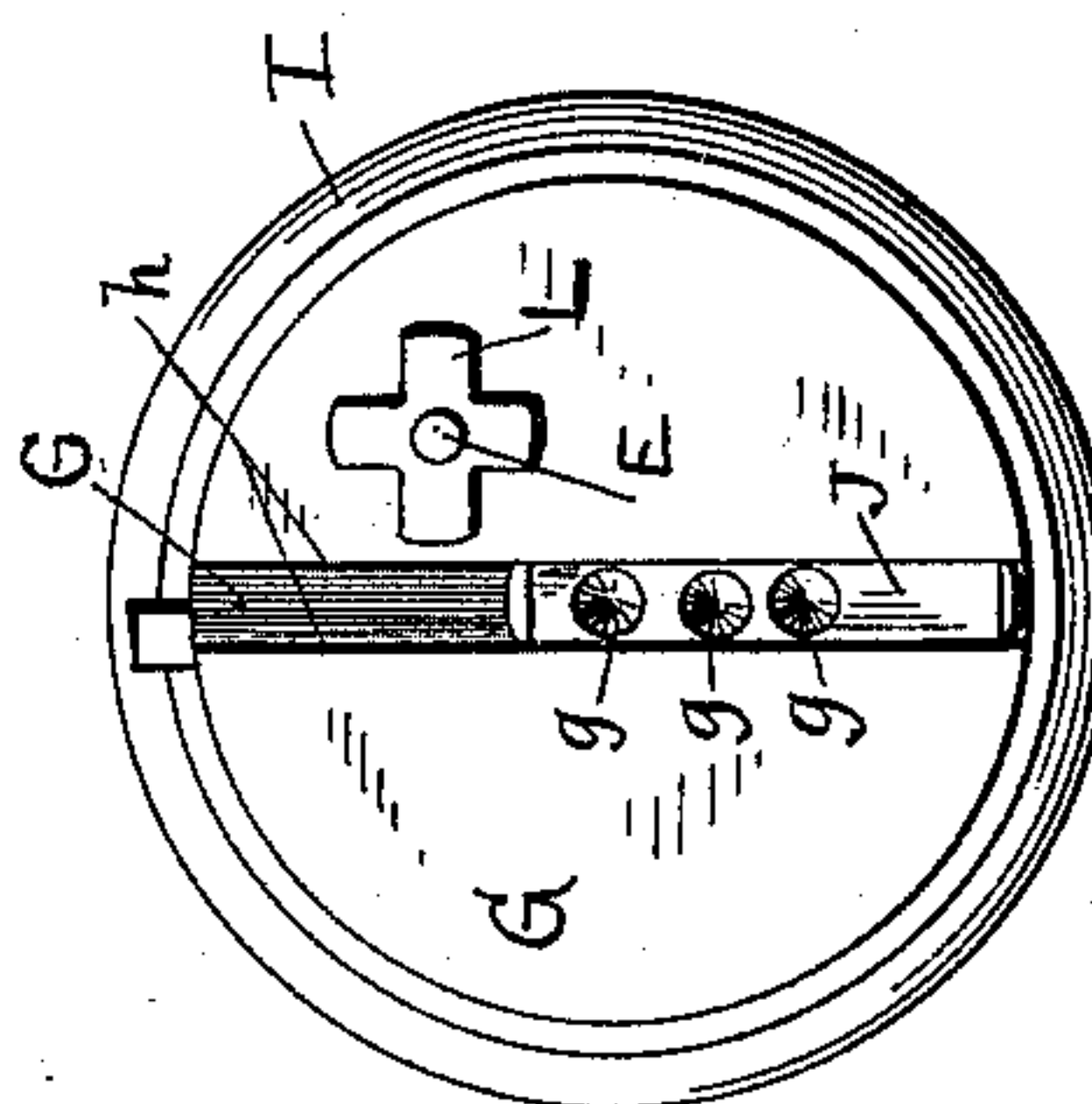
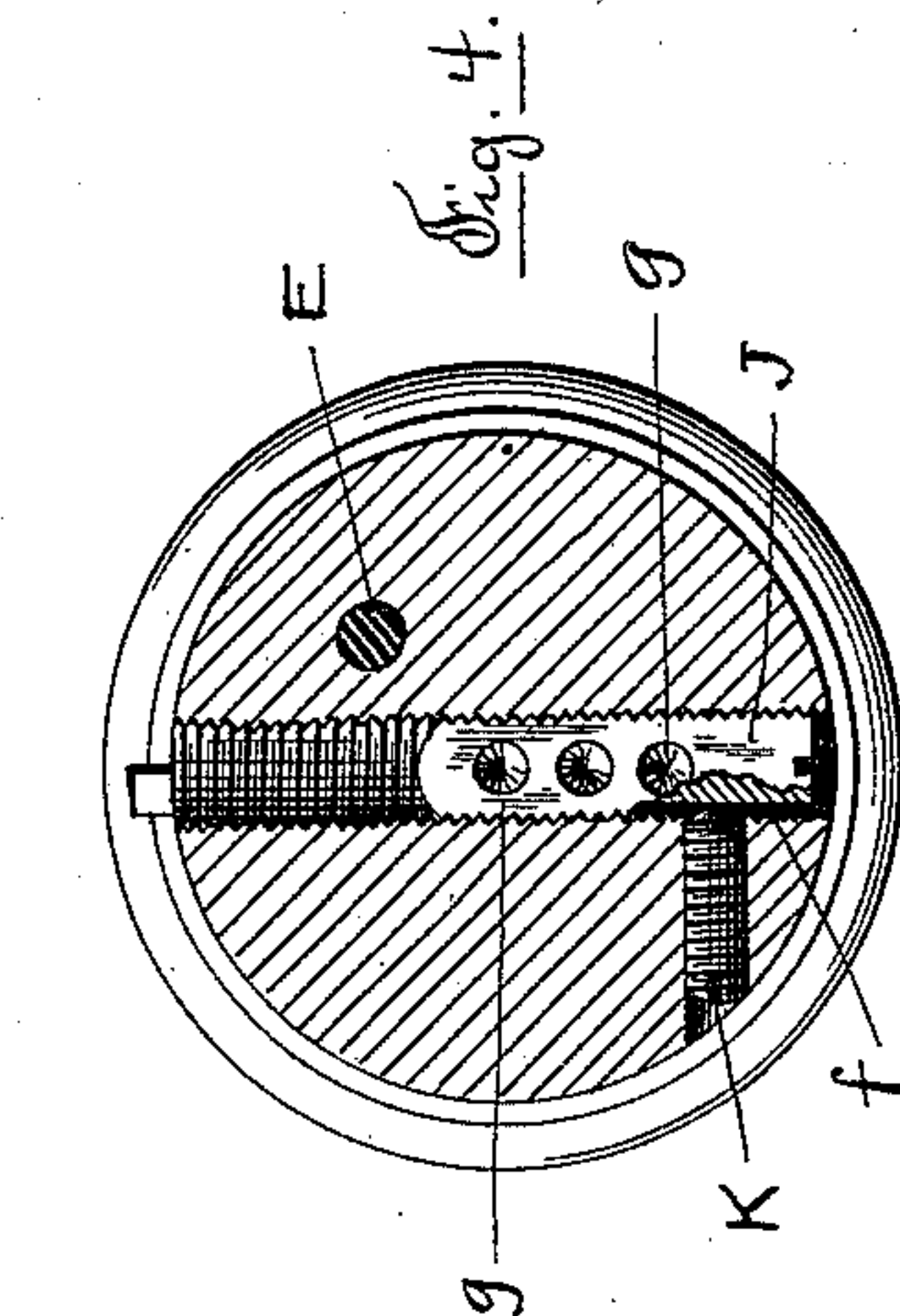
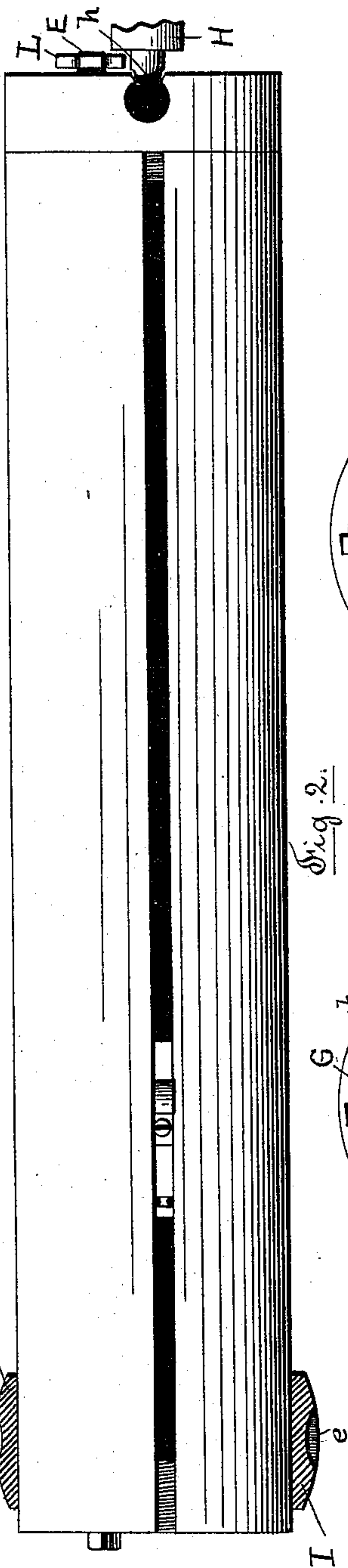
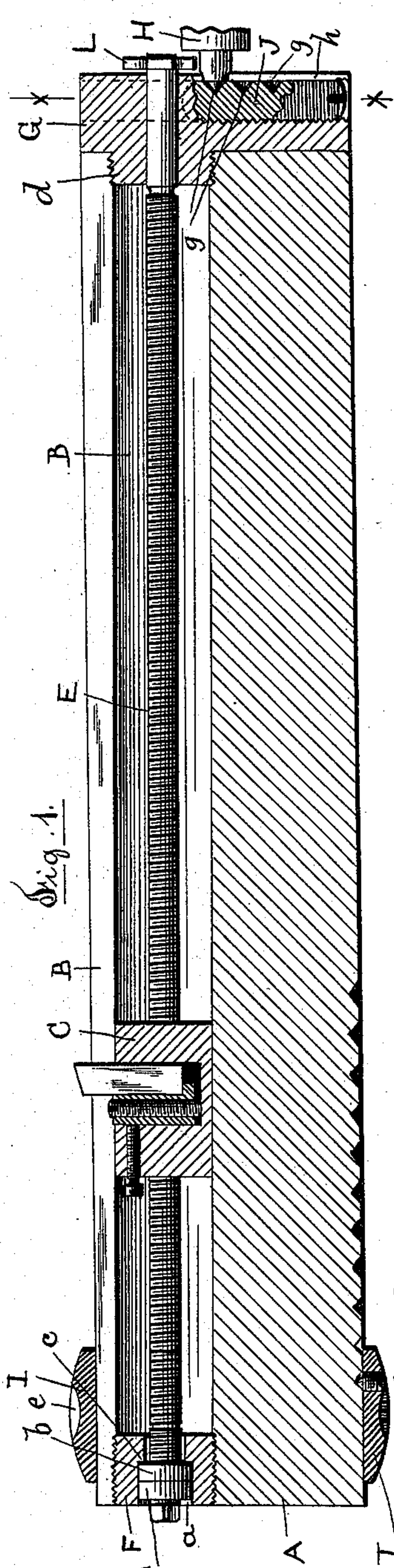


2 Sheets—Sheet 1.

No. 413,697.

Patented Oct. 29, 1889.



Witnesses
Chas. F. Schmelz;

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Inventor

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Jerome M. Hallack

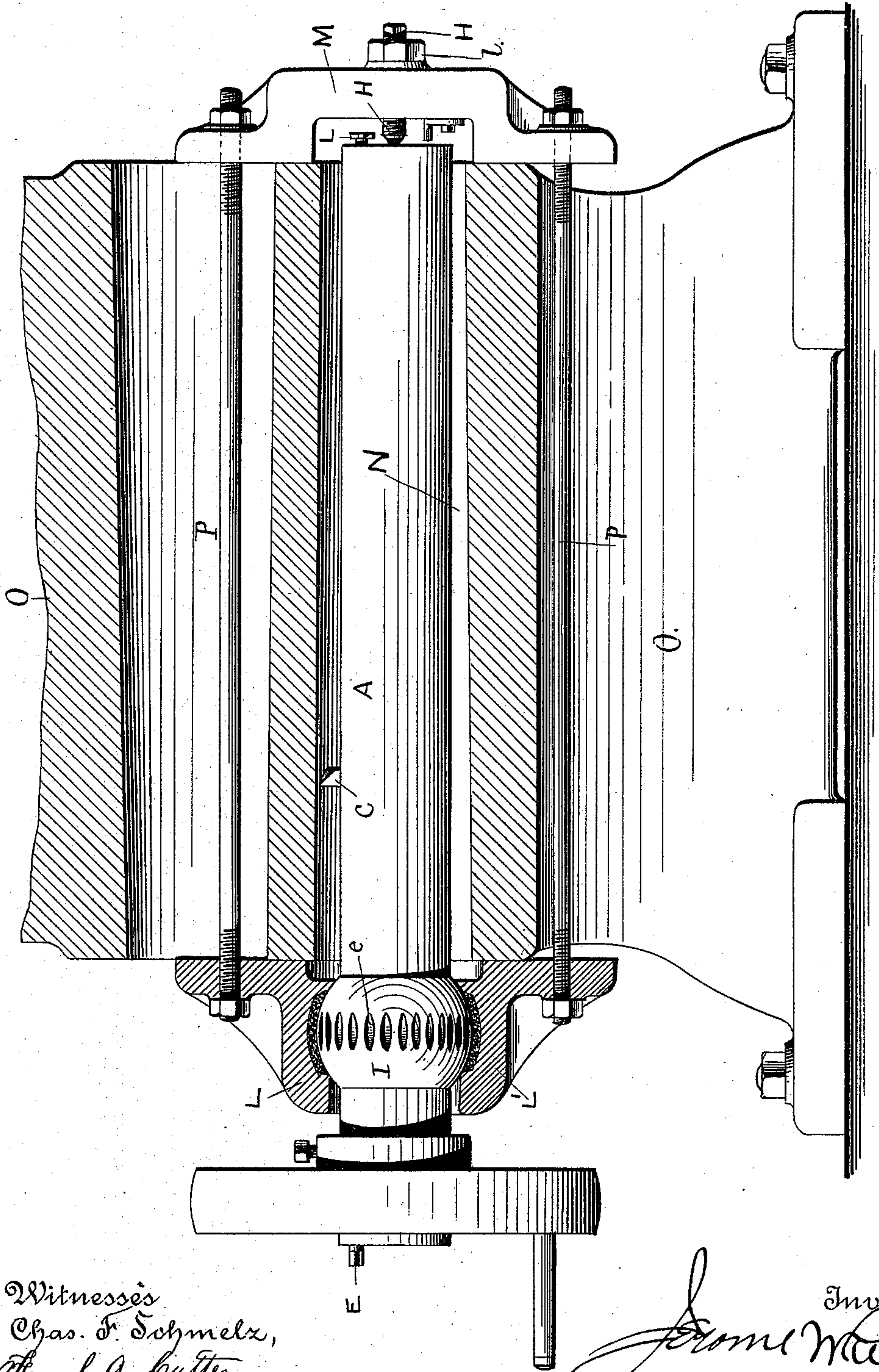
(No Model.)

2 Sheets—Sheet 2.

J. WHEELLOCK.
METAL BORING MACHINE.

No. 413,697.

Patented Oct. 29, 1889.



Witnesses
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UNITED STATES PATENT OFFICE.

JEROME WHEELOCK, OF WORCESTER, MASSACHUSETTS.

METAL-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 413,697, dated October 29, 1889.

Application filed April 8, 1889. Serial No. 306,415. (No model.)

To all whom it may concern:

Be it known that I, JEROME WHEELOCK, a citizen of the United States, residing in Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Metal-Boring Machines, of which the following, in connection with the accompanying drawings, is a specification sufficiently clear and descriptive to enable those skilled in the art to which my invention belongs to make and use the same.

My invention has for its object to provide a boring-bar, which, first, is adapted to bore holes of a diameter almost as small as that of the boring-bar itself; which, secondly, will bore taper holes uniformly, and which, thirdly, may easily be adjusted so as to bore tapering holes at any desired pitch; and my invention consists in several new features of construction, as will be fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section of my improved boring-bar. Fig. 2 is a top view of the same. Fig. 3 represents an end view; and Fig. 4 is a section on line *xx*, Fig. 1. Fig. 5 represents my improved boring-bar as applied to the cylinder of a steam engine for the purpose of boring out the valve-seats.

Similar letters refer to similar parts in the several figures, in which—

A is the boring-bar, which is provided with the slotted chamber B, adapted to receive the tool-carrier C, which firmly holds the cutting-tool and lifter, the construction of which has been fully explained in Letters Patent granted to me on the 2d day of May, 1882, No. 257,422.

The tool-carrier C is caused to move longitudinally within the tubular chamber B by the screw E, one end of which finds its bearings in the plug F, screwed into the chamber B, and having a recess *a*, which receives the check-nuts *b b'*, the innermost *b* of which rests against the shoulder *c*, provided on the plug F, while the periphery of nuts *b b'* forms the wearing-surface of the screw E. At its other end the screw E finds its bearing in the collar G, having a screw-threaded hub *d*, whereby the collar G is firmly secured to the boring-bar A. It will be noticed that the center of the chamber B is nearer to the cen-

ter of the boring-bar at this end, so that a tapered hole is obtained, even if the boring-bar proper is placed centrally in relation to the core in the casting to be bored.

The method of supporting the boring-bar in position may be varied, and I have represented the bar suspended at one end by the center H, such as ordinarily used, while its other end is provided with the special collar I, provided with teeth *e* on its periphery and adapted to be placed within a suitable bearing, all substantially as described in my patent above referred to, and as is clearly illustrated in Fig. 5, in which L designates a globular bearing adapted to receive the collar I, while at the other end of the bar is placed the bracket M, containing the screw-threaded center H, which is prevented from turning by the check-nut *l*.

The boring-bar is shown as boring out the valve-seat N of the cylinder-casting O, and the end bearings of the bar as held together and firmly in position by means of the tie-rods P, passing through lugs on the bearings L and M. The center H enters the screw J in the collar G, said screw J having a fine thread and being provided with the slot *f* for its entire length to receive the end of the check-screw K, which serves to bind the screw J and at the same time answers the purpose of a register-pin, so that the screw J will always assume the same position with that portion of its periphery which is countersunk (see *g g g*, Fig. 1) toward the center H. The screw J is placed near to the side of the collar G, which is cut away to form a slot *h* to allow the center H to enter any one of the countersunk portions at *g*.

It will be readily understood that by setting the boring-bar A so that the center H enters either of the countersunk portions of the screw J a greater or smaller pitch of the hole to be bored is obtained, and this is accomplished as follows: By turning the binder-screw K out of the slot *f* the support-screw J may be turned with a screw-driver in either direction, whereby the position of the countersunk portions relatively to the center of the bar will be changed, and as the binder-screw K is screwed into the slot *f* again the screw J will come to a proper position so that the countersunk portions will face the center

H. By these means a very free and close adjustment may be made, as each rotation on part of the screw J will cause an offset over the previous position of an amount equal to
5 that of the pitch of the screw J.

The mechanism for feeding the tool along within the bar A may be of any well-known construction, the one shown in the drawings consisting, substantially, of a four-fingered
10 button L, adapted to be engaged during its planet motion by an arm or projection on the rigid part of the apparatus, and as the tool projects through the slot in the bar A a key for preventing the rotation of the cutter-head
15 C is obviated and a better result is obtained, inasmuch as the tool itself rests against a firm support at a point near the place where the cutting is done.

What I claim as new, and desire to secure
20 by Letters Patent, is as follows:

1. The combination of a boring-bar having a tubular chamber the axis of which is at an angle with the axis of the bar, and a cutter-head adapted to slide within said chamber,
25 with means, substantially as described, for imparting a sliding motion to said cutter-head, as and for the purpose set forth.

2. The combination of a boring-bar having a tubular chamber the axis of which is at an angle with the axis of the bar, a cutter-head
30 sliding within said chamber, and means, substantially as described, for imparting a sliding movement to said cutter-head, with a supporting-screw near one end of said bar, whereby the angle between the chamber and
35 the axis of the bore may be varied, substantially as and for the purpose set forth.

3. The combination of a boring-bar having a tubular chamber, a cutter-head sliding within said chamber, means, substantially as
40 described, for imparting a sliding movement to said cutter-head, and a supporting-screw whereby the position of the axis of the chamber relatively to the axis of the bore may be varied, with a check-screw whereby said sup-
45 porting-screw is secured and uniformly held in position relatively to the center which supports the bar, substantially as and for the purpose set forth.

JEROME WHEELLOCK.

Witnesses:

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