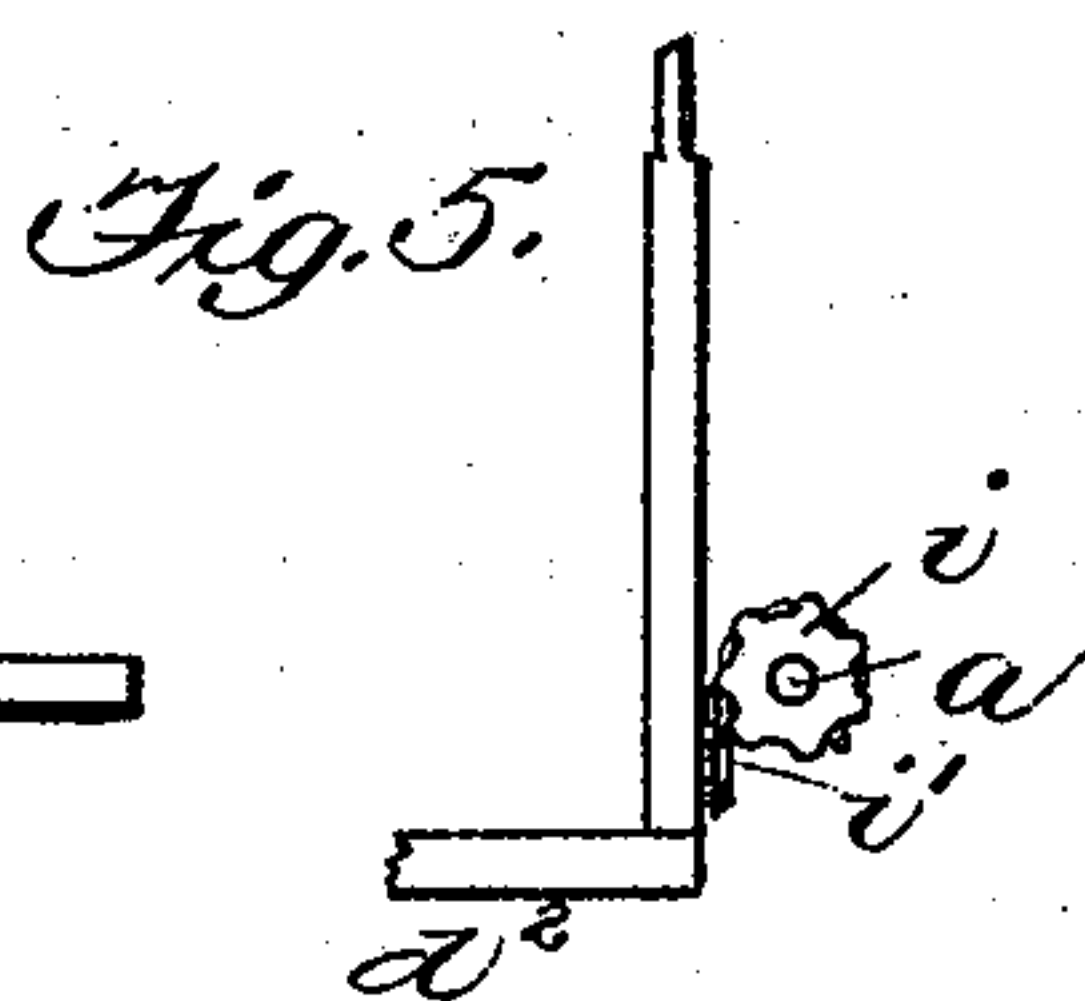
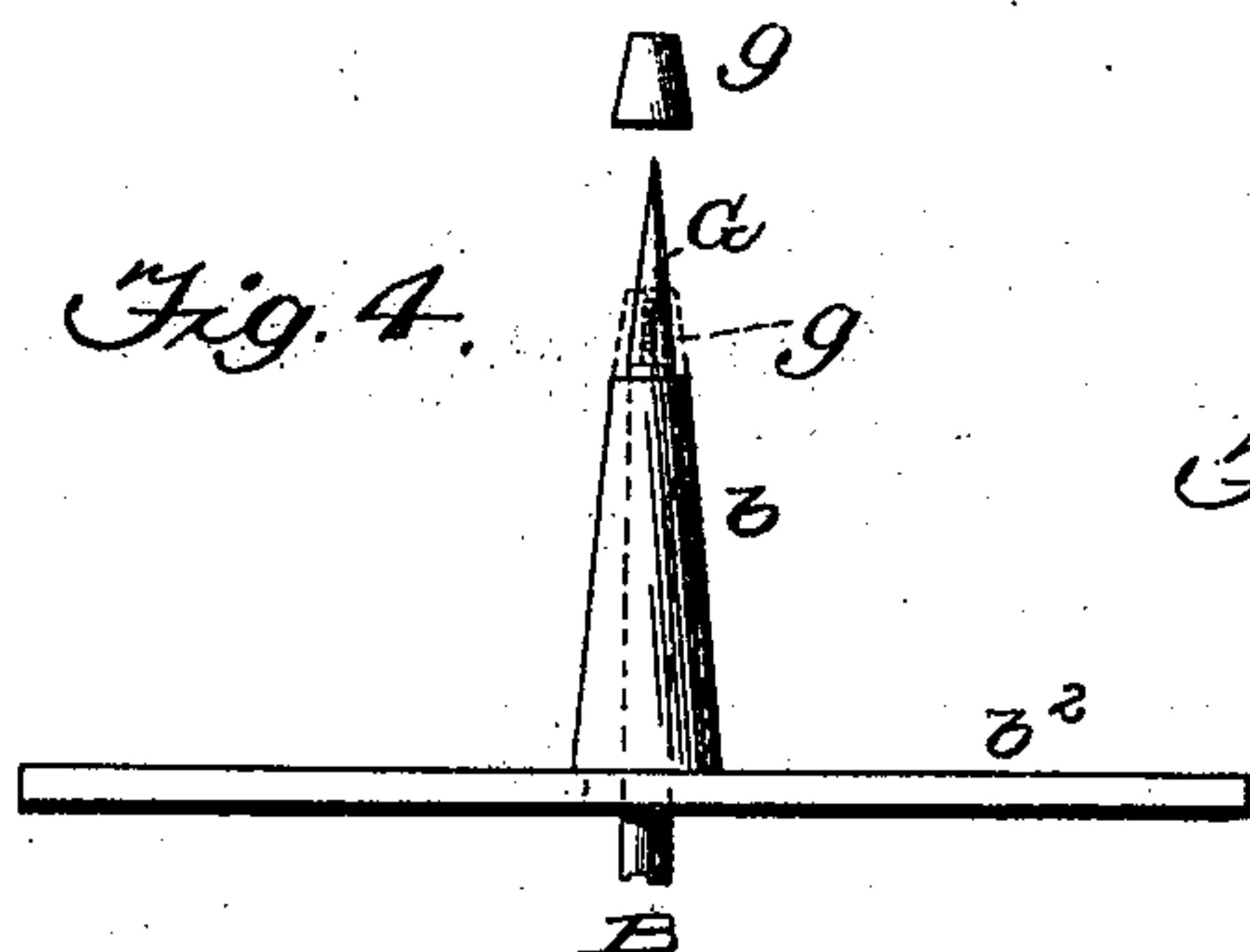
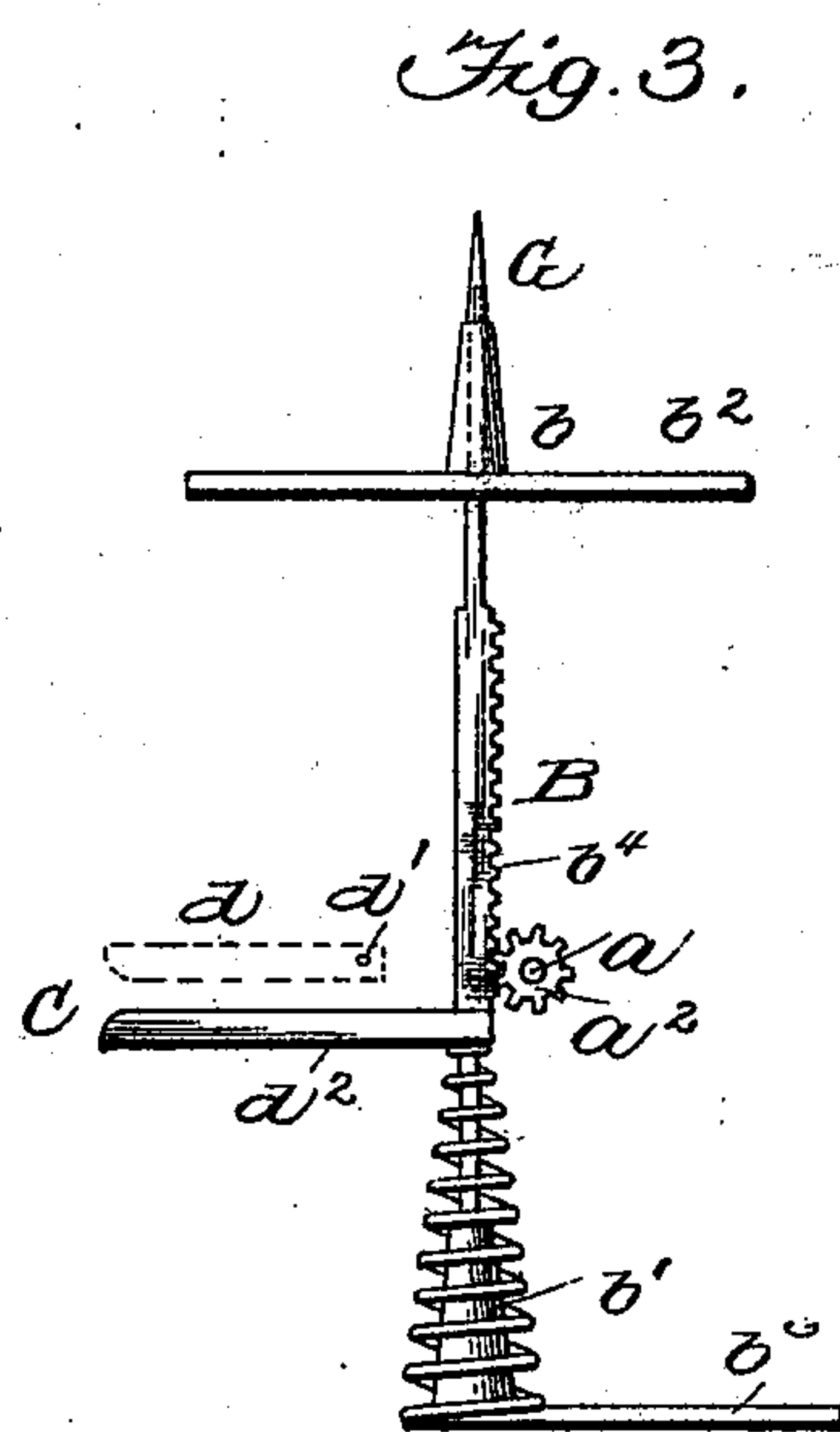
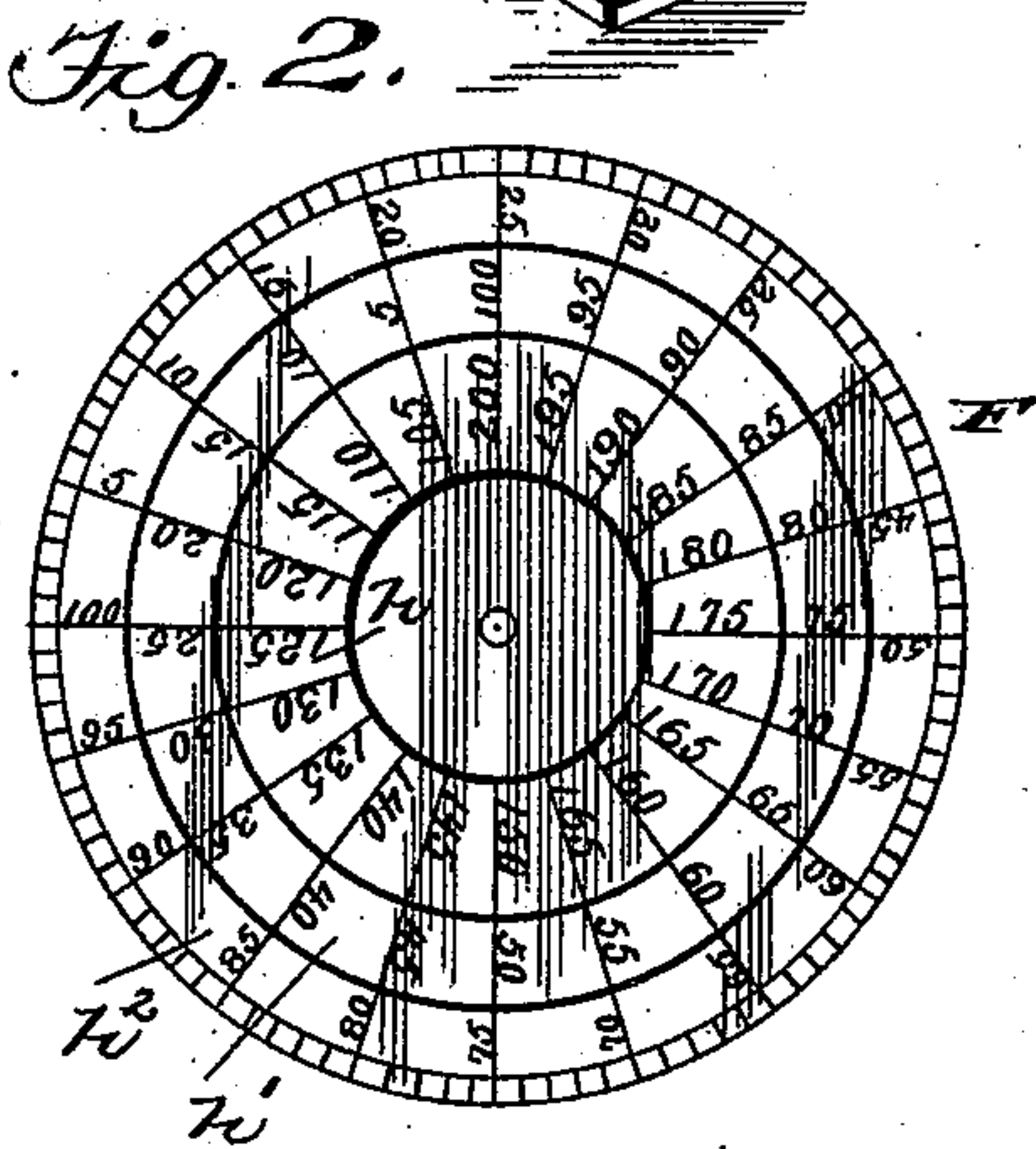
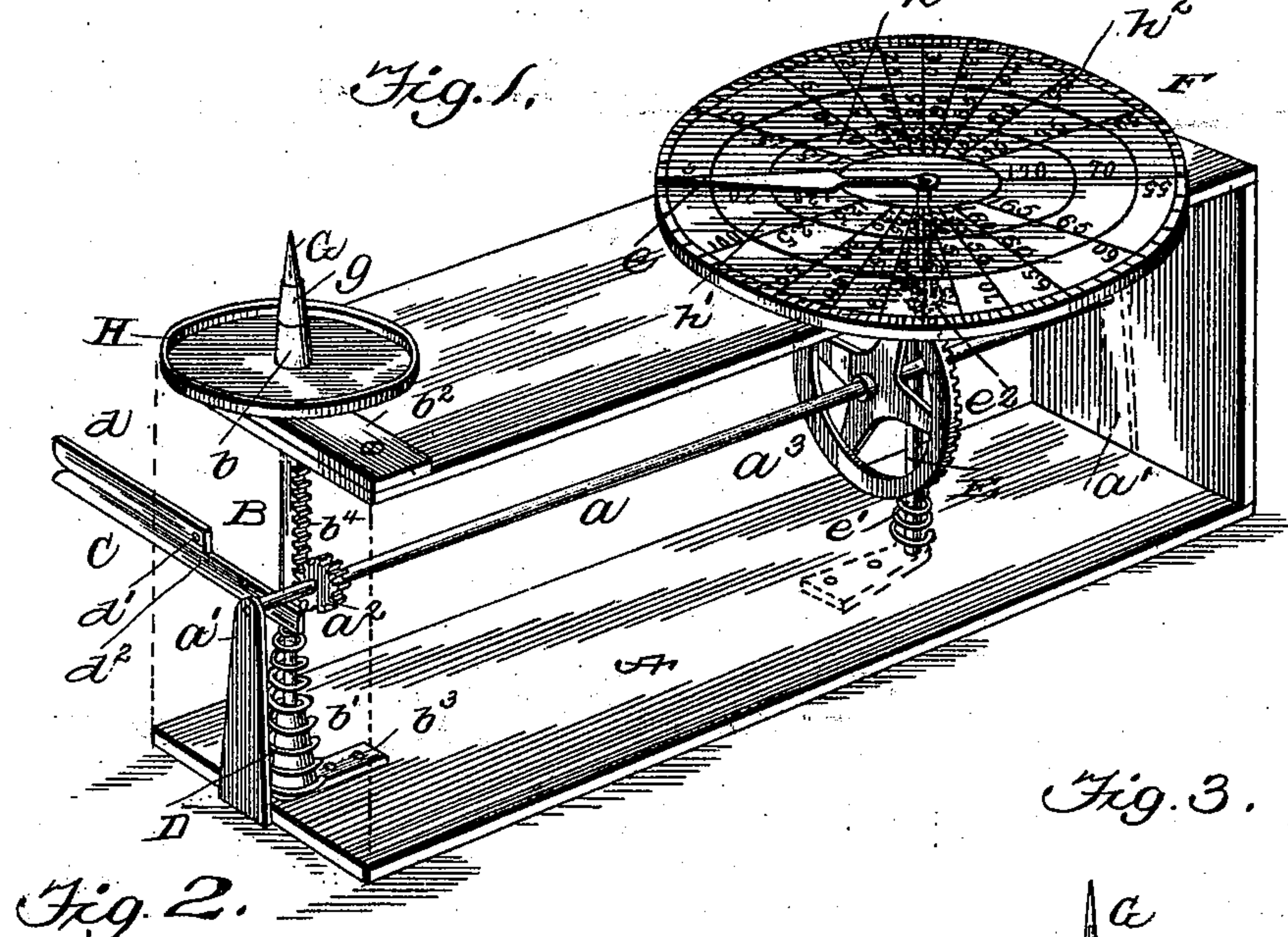


(No Model.)

J. E. ADCOX.
JEWEL AND PIVOT GAGE.

No. 502,648.

Patented Aug. 1, 1893.



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JOSEPH EPHRIAM ADCOX, OF LEBANON, OREGON.

JEWEL AND PIVOT GAGE.

SPECIFICATION forming part of Letters Patent No. 502,648, dated August 1, 1893.

Application filed July 8, 1892. Serial No. 439,424. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH EPHRIAM ADCOX, of Lebanon, in the county of Linn and State of Oregon, have invented certain new and useful Improvements in Jewel and Pivot Gages; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a new and improved jewel and pivot gage, and it has for its object the production of cheap, simple, and highly efficient means for measuring holes in watch jewels, or any other article where the exact diameter of a hole in a substance is required even to a small fraction of an inch, centimeter or millimeter; and also to facilitate the measurement of watch pinions, arbors, &c., and various pivots, the exact diameter being obtained.

The invention consists of a jewel or pivot gage having a dial divided into fractional parts of an inch, centimeter or millimeter, an index hand movable thereover by a rotary shaft, and a bar having an upper pointed end and designed to rotate said shaft, the upper end of said bar being designed to be projected through the hole the diameter of which is to be ascertained.

The invention further consists of a jewel or pivot gage having a dial divided into fractional parts of an inch, centimeter or millimeter, an index hand movable thereover by a rotary shaft, a bar designed to rotate said shaft, and a pair of calipers, one part or member of which is movable with said bar, the pinion, the arbor, pivot or the like to be measured, being designed to be placed between the parts of said calipers.

The invention also comprises the detail construction, combination and arrangement of parts, substantially as hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings:—Figure 1 is a view in perspective of my improved jewel or pivot gage, parts being removed. Fig. 2 is a plan view of the dial. Fig. 3 is an enlarged view of the main arbor and its ad-

juncts. Fig. 4 is a view showing the cone and collar for the upper end of the arbor. Fig. 5 is a view of a slight modification.

Referring to the drawings, A designates a box or case, and a a rotary shaft passed longitudinally through said box or case, and supported at its ends by plates a' attached to the ends of the box. Upon shaft a near one end is a pinion a^2 , and near its other end is a crown-wheel a^3 .

B is a vertically disposed bar, guided at its ends by tubes b, b' projecting from plates b^2, b^3 , secured, respectively, to the top and bottom of box A, the ends of said bar being circularly reduced. In one side of this arbor are rack-teeth b^4 designed to engage with pinion a^2 , and effect the rotation of shaft a when said arbor is depressed.

C designates a pair of calipers, composed of the stationary part d attached at d' to the end of box A and projecting out through a slot in the side of said box, and a movable part d^2 secured to bar B. The outer ends of these parts d, d^2 , are curved so as to form a guide for the entrance of a shaft or pivot to be gaged. A coil spring D encircles the lower end of bar B and tube b' and bears against the inner end of part d^2 of the calipers, the same serving to hold the bar B normally elevated and the parts of the calipers closed together.

E is a vertical arbor projected through an opening in the top of box A and having an index hand e secured thereto, the lower end of said arbor being supported by a coil spring e' . Upon this arbor E is a pinion e^2 with which the crown wheel a^3 is designed to engage and through this agency motion is imparted to the index arbor. The index hand e travels over a circular dial F, located over the top of box A.

For ascertaining the diameter of holes in jewels, I employ a true tapering cone G which screws down on a threaded extension of the upper end of bar B. The lower end of this cone can be inclosed by a collar g designed to be slipped down thereover and rest upon the upper end of tube b . When the collar g is removed the top of tube b acts as a stop for the jewel held on the cone, but when the col-

lar is employed the upper thereof serves as such stop. A cup-like plate H having a central cylindrical portion fits over tube *b* and serves to catch any jewels that may fall in the measurements of the holes thereof.

The figures on the dials are arranged in three consecutive circles, as *h*, *h'*, *h*². I use for a standard one-twentieth (1-20) of an inch. Hence when the parts of the calipers are separated to one-twentieth of an inch the index hand will have made one circumference of the dial. The circles of the dial are divided into one hundred (100) degrees. Consequently one twentieth (1-20) of an inch being the standard, each degree shows one two-thousandth of an inch, and half degrees one four-thousandth of an inch. For measurement with the calipers of staffs, arbors, pivots and the like, the figures of the outer circle *h*² are used, and read to the left, thus 5/2000; 10/2000; 15/2000, &c., around to 100/2000 of an inch, which is, of course, one-twentieth of an inch. In measuring holes in jewels and the like I use the second circle *h'*. The reading is started at 100/2000. Thus: 105/2000; 110/2000 of an inch and so on. The cone G is one-tenth (1-10) of an inch in length and at the top of tube *b* is one fortieth (1-40) of an inch in diameter. Consequently the cone measuring one-fortieth (1-40) of an inch in diameter and tapering to a point at one-tenth (1-10) of an inch in length and divided into one-hundred (100) spaces, each space shows one eight-thousandth of an inch. When the collar *g* is not used the inner circle *h* forms the basis of measurement, the top of tube *b* serving as a stop for the jewel or substance measured on the cone, and said cone is pressed down until the index hand reaches 200 on the inner circle *h* of the dial. The cone G is one-fortieth of an inch in diameter at the top of tube *b* and also for a distance of one-tenth of an inch. Hence the index hand will make one complete circumference of the dial for each section of the cone. When the index hand will have made one circumference of the dial the cone measures one-eightieth of an inch in diameter at top of tube *b*, commencing at 200 on dial, which means two hundred eight-thousandths of an inch, equals one-fortieth, the reading being 105/8000; 110/8000, &c. When the collar *g* is employed, the projecting end of the cone is but one-twentieth of an inch and the cone measures one-eightieth of an inch in diameter at top of said collar. When the collar is used and the index hand is at 100 on middle circle *h'*, it means one hundred eight-thousandths or one-eightieth of an inch, and the reading is 5/8000 and so on. By this arrangement I greatly facilitate the reading. For example: say an opening in a jewel measures forty eight-thousandths of an inch. This I divide by four which gives ten two-thousandths of an inch, the size of the pivot required being nine two-thousandths. In fitting jewels to pivots the reverse is the result. If the diameter of the hole to be measured is greater than one-eight-

ietth of an inch, collar *g* is removed and the top of tube *b* serves as a stop for the jewels.

With this explanation the operation and advantages of my invention are apparent. It will be observed that the smaller the diameter of the hole in the jewel the greater distance the bar B is depressed. The depressing of this bar, either by a jewel on the cone, or by placing staffs, pivot or the like, within the calipers, the shaft *a* will be made to rotate and motion be imparted to the arbor carrying the index-hand.

It will be seen that I have produced a jewel and pivot gage which is extremely simple in construction; inexpensive and durable and that it is not liable to readily get out of order or be deranged.

In Fig. 5 I have shown a slight modification of the form of connection between the bar B and the operating shaft. In lieu of the pinion and rack-teeth, I employ a wheel *i* on shaft *a* to which is connected one end of a chain *i'*, the other end thereof being secured to bar B. This form is employed when a change of standard is made from a fraction of an inch to centimeters or millimeters. Or any fractional part of an inch, centimeter or millimeter can be employed as a standard by enlarging or reducing the circumference of crown-wheel *a*³ and increasing or reducing the number of teeth in said wheel accordingly.

I claim as my invention—

1. A gage for jewels and arbors, pivots and the like, having a dial of the character stated, the index hand moving thereover, a movable bar having an upper reduced end for the jewels, a pair of calipers connected with said bar, and suitable connecting mechanism between said bar and said index hand, substantially as set forth.

2. The herein-described improved gage for jewels and arbors, comprising the vertically disposed movable bar, the horizontal rotary shaft operated thereby, the vertical arbor having an index hand and operated by said shaft, and the dial having an arrangement of figures thereon of the character herein-described, substantially as set forth.

3. The herein-described improved gage for jewels and arbors, comprising the vertically disposed movable bar having an upper reduced end, guides therefor forming a stop, the horizontal rotary shaft operated by said bar, the arbor operated by said shaft and having an index hand on its upper end, and the dial over which said hand travels, substantially as set forth.

4. The herein-described improved gage, comprising the movable bar having a cone end, tubes through which said bar is passed, a collar designed to rest on one of said tubes and inclose said cone end, the rotary shaft operated by said arbor, the bar operated by said shaft and having an index hand, and the dial, substantially as set forth.

5. The herein-described improved gage,

comprising the movable bar, the tubes guiding the same, the spring holding said bar, the rotary shaft movable with said bar, the dial, the arbor having an index hand extending
5 over said dial, the spring supporting said arbor, and the connection between said arbor and shaft, as set forth.

6. The herein-described improved gage for jewels and arbors, comprising the vertical bar
10 having teeth, the horizontal rotary shaft having a pinion meshing with said teeth, the arbor carrying an index hand at its upper end and operated by said shaft, the dial, and the removable cone on the upper end of said bar,
15 as set forth.

7. The herein-described improved gage, comprising the vertically disposed movable bar, the horizontally disposed calipers having one of its parts movable with said bar, the rotary shaft operated by said bar, the dial, and
20 the arbor carrying an index hand and operated by said shaft, as set forth.

8. The herein-described improved gage, comprising the box having a slot in one side,
25 the movable bar having teeth, the calipers extended through said slot and having one part secured to said box, the other part being attached to said bar, the rotary shaft having

a pinion engaging said teeth, the crown-wheel on said shaft, the arbor having a pinion in
30 engagement with said crown-wheel, the dial, and the index hand secured to said latter bar, substantially as set forth.

9. The herein-described improved gage, comprising the box, the tubes secured to the
35 top and bottom thereof, the bar having a spring support, and provided with teeth, the cone on the upper end of said bar, the inclosing collar, the rotary shaft having a pinion meshing with said teeth, the crown-wheel on
40 said shaft, the dial, the arbor having an index-hand over said dial, the pinion on said arbor, and the spring supporting the latter, substantially as set forth.

10. A jewel gage of the character herein-
45 described, having a movable bar on which the jewels are fitted, and a removable cup-like plate encircling said bar beneath the upper end thereof, as set forth.

In testimony whereof I have signed this
50 specification in the presence of two subscribing witnesses.

JOSEPH EPHRIAM ADCOX.

Witnesses:

A. FRUM,

W. C. PETERSON.