

No. 638,125

Patented Nov. 28, 1899.

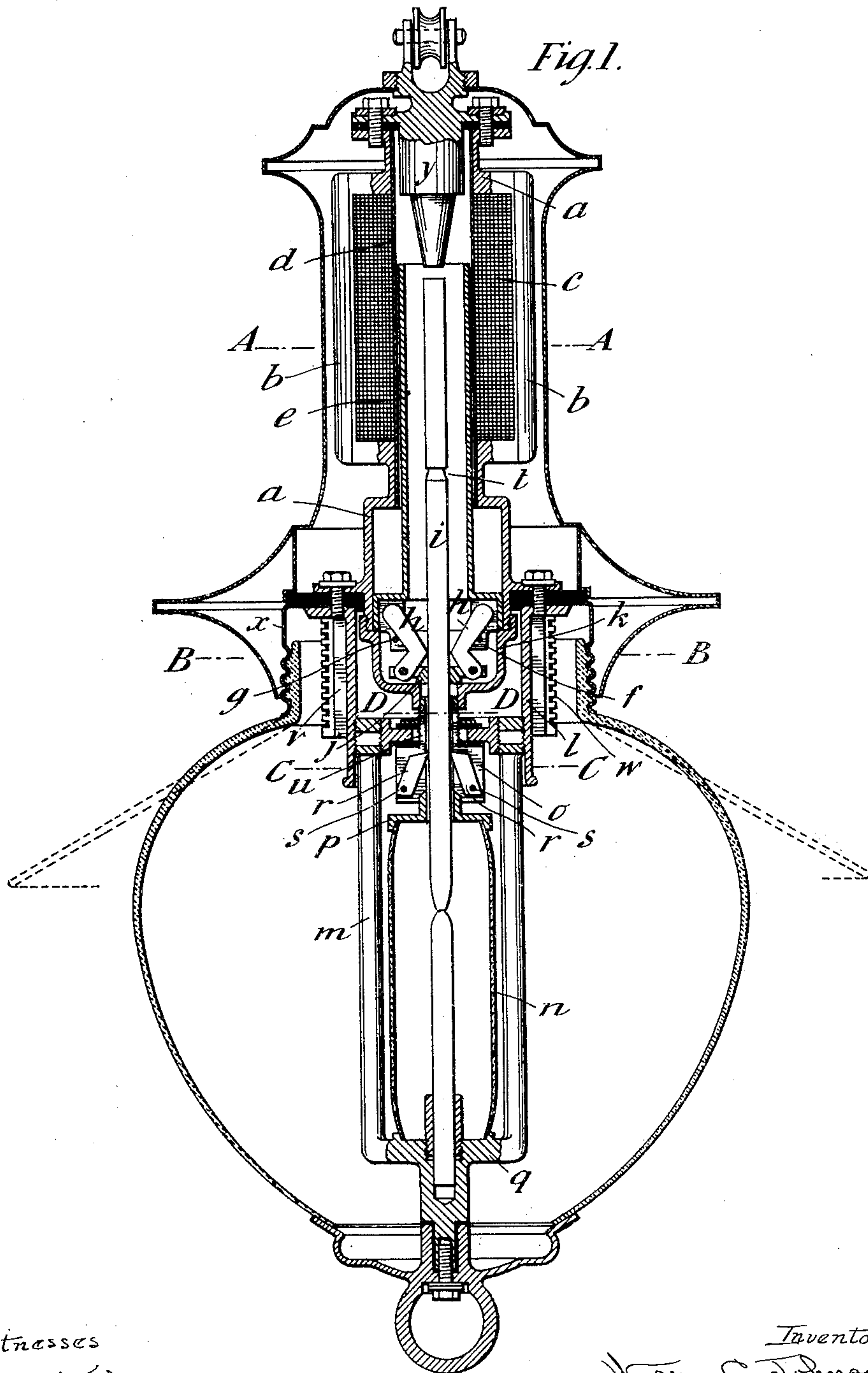
W. C. JOHNSON & A. WUNDERLICH.

ELECTRIC ARC LAMP.

(Application filed Apr. 4, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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*Philip W. Sildew*

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*By James L. Norris*



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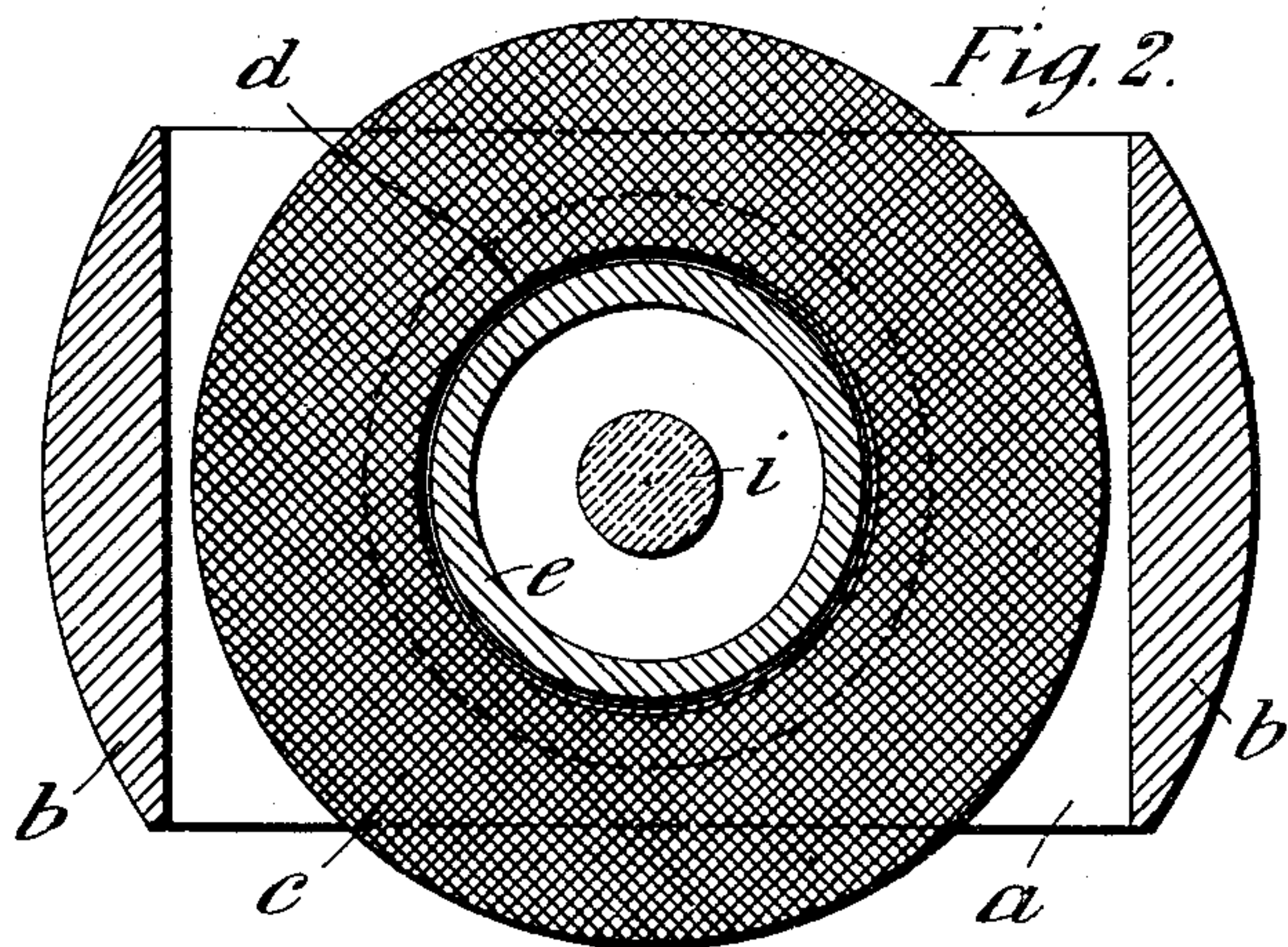


Fig. 2.

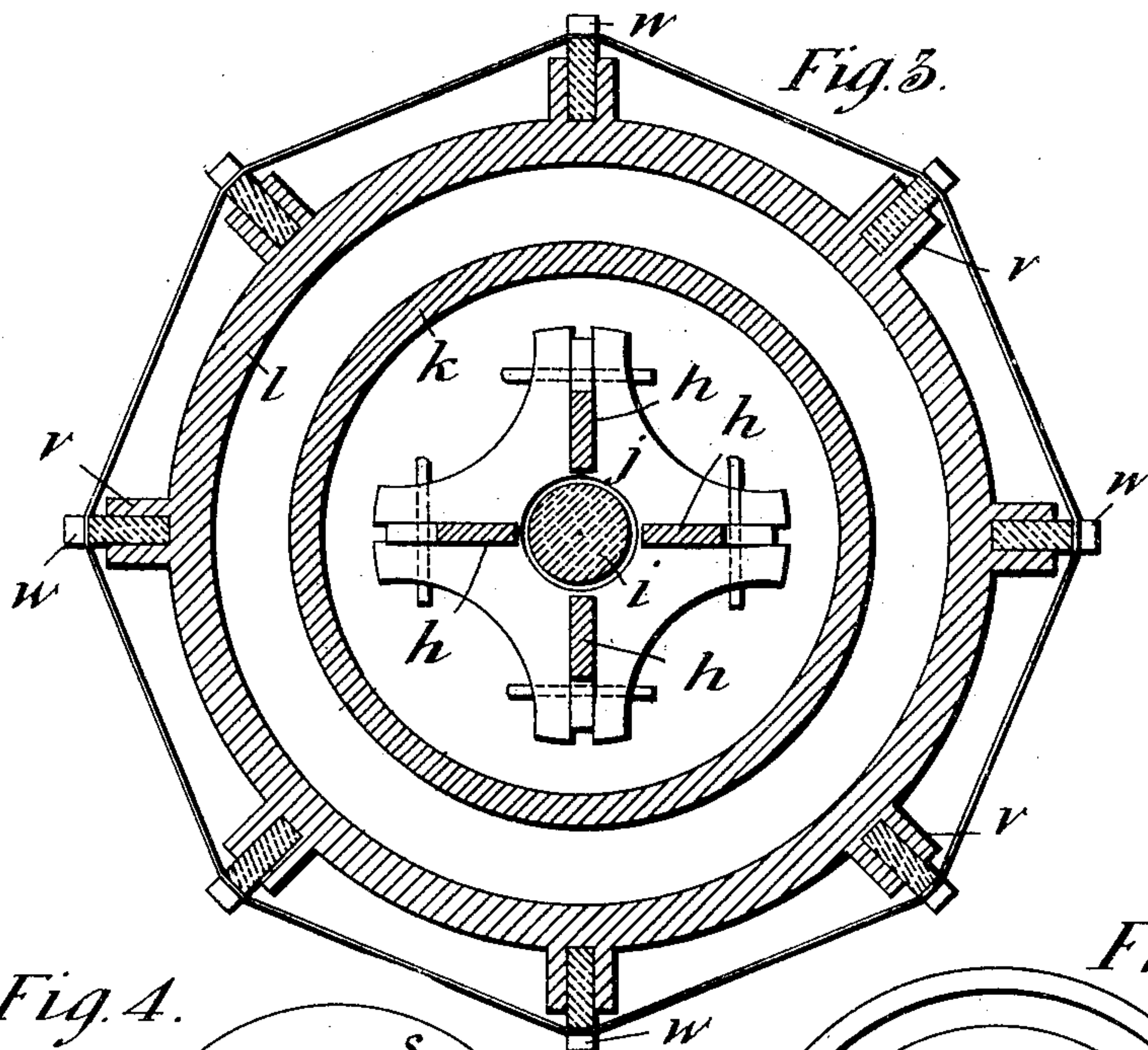


Fig. 3.

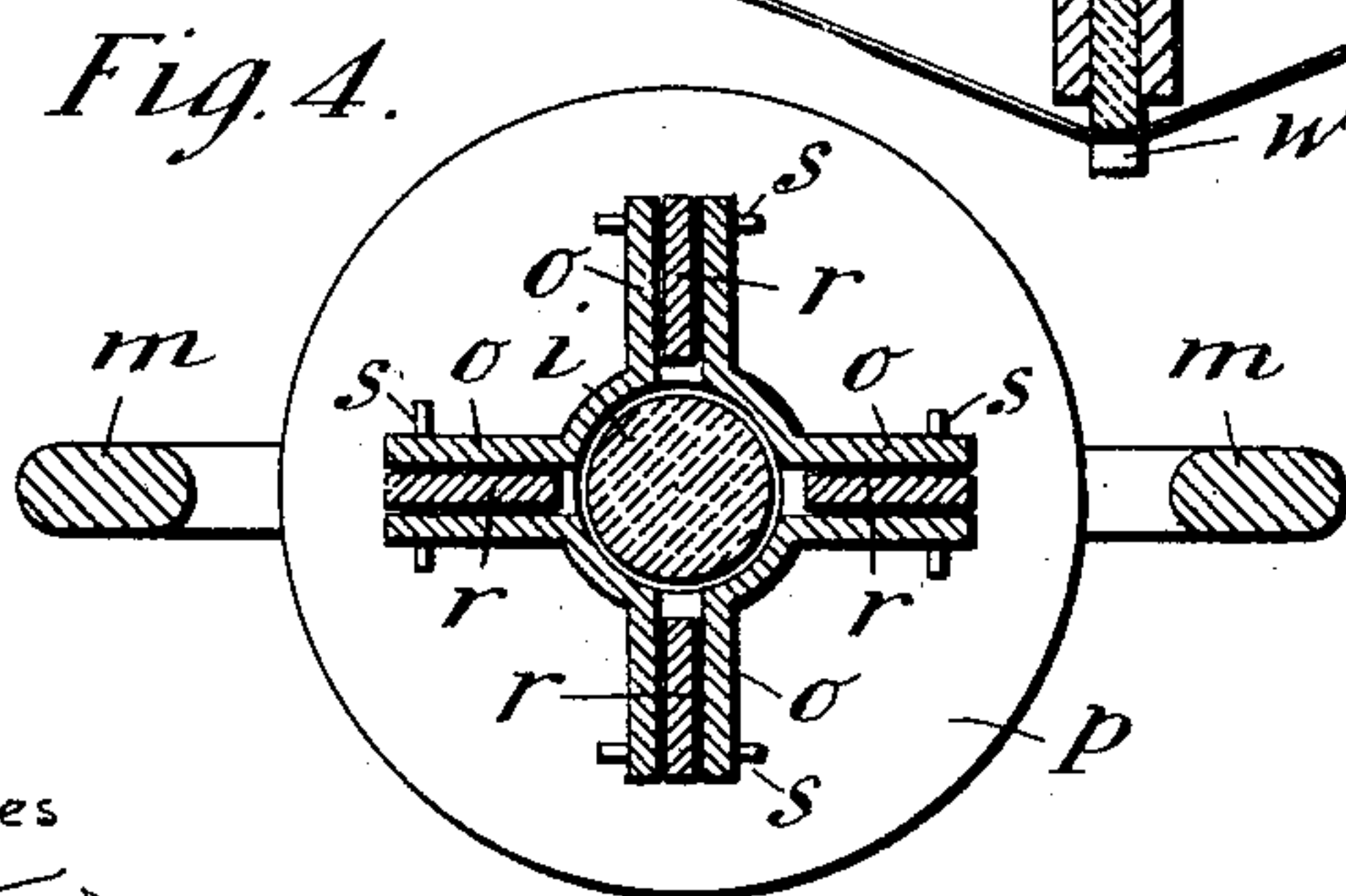


Fig. 4.

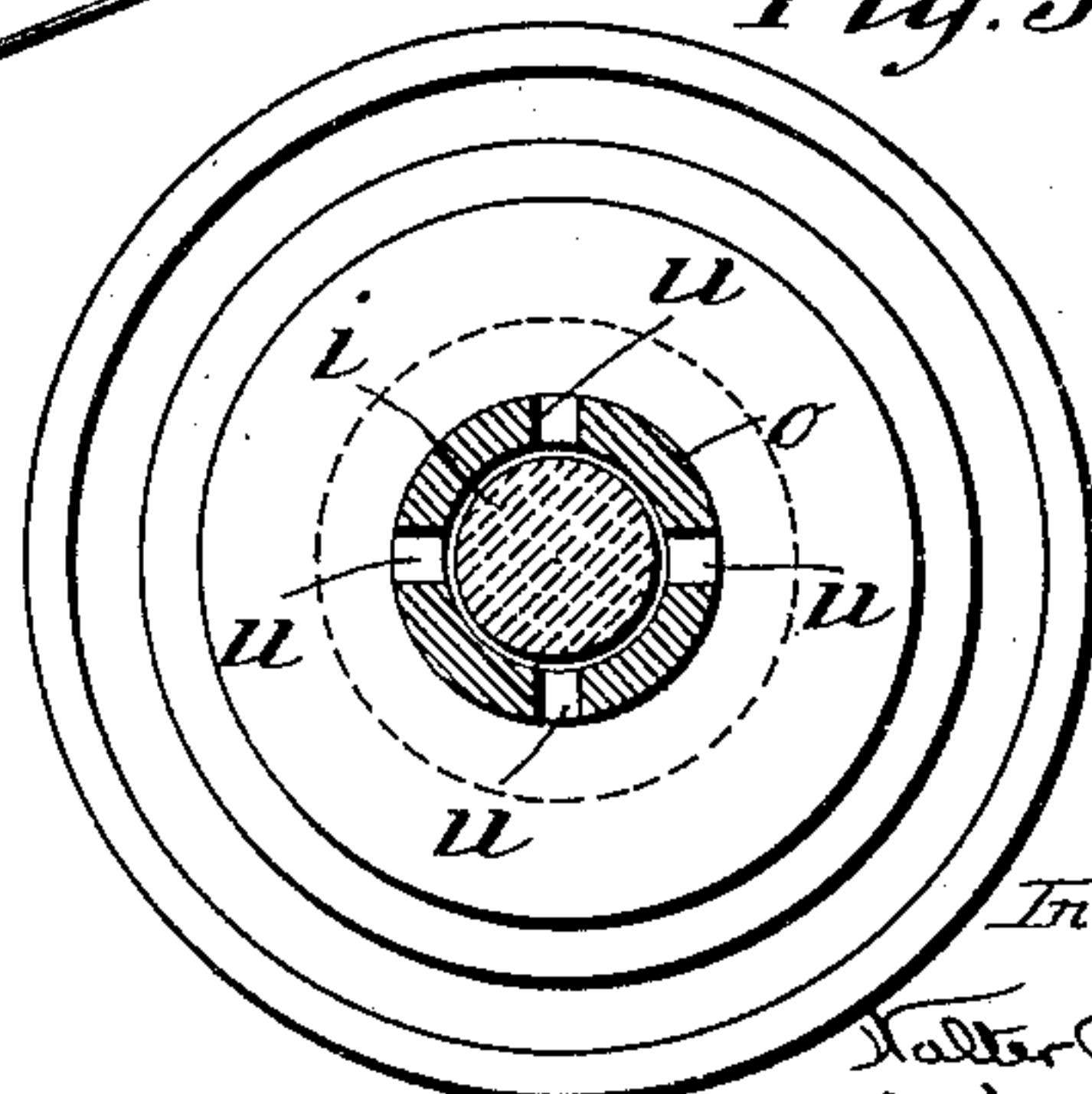


Fig. 5.

Witnesses

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# UNITED STATES PATENT OFFICE.

WALTER CLAUDE JOHNSON AND ADOLPH WUNDERLICH, OF LONDON,  
ENGLAND.

## ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 638,125, dated November 28, 1899.

Application filed April 4, 1899. Serial No. 711,749. (No model.)

*To all whom it may concern:*

Be it known that we, WALTER CLAUDE JOHNSON, electrical engineer, residing at The Dignaries, Westcombe Park, Blackheath, and  
5 ADOLPH WUNDERLICH, electrician, residing at No. 11 Osborne Terrace, Westcombe Park, Blackheath, London, in the county of Kent, England, citizens of England, have invented certain new and useful Improvements in Arc-  
10 Lamps, (for which we have applied for a patent in Great Britain, dated the 25th of February, 1899, No. 4,231,) of which the following is a specification.

This invention relates to arc-lamps wherein  
15 the carbons are inclosed in a more or less hermetically-closed globe or glass; and the present invention consists in the features of construction and in the combination or arrangement of parts hereinafter described and  
20 claimed, reference being made to the accompanying drawings, in which—

Figure 1 shows a vertical section of the improved lamp, while Figs. 2 to 5 show enlarged sections taken, respectively, at A A, B B, C C,  
25 and D D, Fig. 1.

The regulating mechanism is contained in a casing *a*, formed of a single casting, in the looped part *b* of which is situated the solenoid *c*. Within the central tube *d* of the solenoid  
30 is the tubular core or armature *e*, also formed as a single casting, the lower flanged end of which has brackets *f*, that carry pins *g*, which operate upon the device *h* for clutching the upper carbon *i*. This clutch device consists of a  
35 series of angular cam-levers *h*, that are pivoted to brackets on a loose annular plate *j*. When the armature *e* is in the lowered position, the plate *j* rests upon a support composed of the bottom of the cup-shaped cap-piece *k*, that is  
40 secured to and closes the lower end of the casing *a*. In this position the action of gravity upon the upper ends of the clutch-levers *h* causes these to turn outward upon their pivots, so that they release the upper carbon,  
45 which is then free to descend toward the lower carbon. On the other hand, when the lamp is put in circuit the armature *e* being drawn upward first acts upon the levers *h* by the pins *g*, so as to cause these to clutch the carbon, and then raises them, together with the  
50 carbon, so as to strike the arc. As the car-

bons consume (which takes place at an exceedingly slow rate, owing to their being inclosed practically air-tight) the armature descends again, causing the levers *h* to release  
55 the carbons sufficiently to effect the required downward feed for maintaining the arc.

To the under side of the casing is secured in an insulated manner a cylindrical piece *l*, into the lower end of which is screwed the  
60 upper end of the frame *m*, that holds the glass *n*, inclosing the carbons. Into the central opening of such frame is screwed a disk, which is secured in an insulated manner to a central brass casting *o*, having a disk *p* at its  
65 lower end, which constitutes the cap for closing and holding the glass *n*, the lower end of which rests upon a disk *q*, forming the bottom of the frame *m*. The casting *o* is formed  
70 with a central cylindrical piece having four vertical slotted wings, in the slots of which are situated contact-pieces *r*, that convey the current to the upper carbon, and are pivoted  
75 at *s* to the wings and formed as shown at Fig. 1, so that they tend to fall inward, and thus make the necessary electrical contact with the upper carbon for conveying the current thereto. The upper carbon has a circular  
80 groove *t* formed near its upper end, and when it has burned away to such an extent that this groove arrives on a level with the upper ends of the contact-pieces *r* these become engaged with such groove, and in thus preventing the further descent of the carbon operate  
85 as an automatic cut-out.

The suspended cylinder *l* is formed with slotted radial ribs *v*, containing radial insulating-plates *w*, each constructed with a plurality of notches in its outer edge, as best seen in Figs. 1 and 3. The resistance-coil of  
90 the circuit is wound around within the notches of the insulating-plates and is in the form of a thin metal band, and since it is so supported that almost the entire surface thereof is in contact with the air the heat generated  
95 will be most efficiently conducted away therefrom. By this arrangement of the resistance-coil a great economy in space is obtained. For carrying the outer globe (or reflector, as shown in dotted lines, or screen) there is se-  
100 cured between the casing *a* and cylinder *l* a thin metal cap *x*, having a rounded coarse



screw-thread formed thereon, as shown, and a corresponding screw-thread is formed on the neck of the globe or reflector, thus providing a ready means of attachment without requiring the usual metal fittings on the globe, &c.

The magnetic circuit of the solenoid is closed at top by the soft-iron piece *y* in a known manner, which piece is extended conically downward, so as to act upon the upper end of the armature *e*.

It will be seen from the above description that the improved lamp is of the most simple construction and action, the number of parts being reduced to a minimum, and thereby decreasing both the size and expense of the lamp.

Having thus described the nature of this invention and the best means we know of carrying the same into practical effect, we claim—

1. In an arc-lamp, the combination of a casing, a regulating-solenoid supported by the casing and having an armature movable in the latter, an upper carbon working freely in the armature, a carbon-clutch composed of a loose plate, gravitating angular levers pivoted thereto and pins on the lower end of the armature to bear against inclined outer edges of the levers, and a cap-piece attached to and closing the lower end of the casing and against which said loose plate rests when the armature is in its lowest position, substantially as described.

2. In an arc-lamp, the combination of a casing having a frame on its upper part, a regulating-solenoid arranged in said frame, an armature-movable in said casing and having a flanged lower end, an upper carbon working freely in the armature, a carbon-clutch composed of a loose plate having radial brackets, angular levers pivoted at their lower ends in said brackets and projecting outward at their upper end portions, and pins carried by the flanged end of the armature to bear against the outer inclined edges of the levers, and a cap-piece attached to the lower end of the casing and in which said loose plate rises and falls, substantially as described.

3. In an arc-lamp, the combination with the regulating-solenoid *c*, the casting or frame *a*, and the upper carbon having the groove *t*, of the insulated casting *o*, and electric contact-pieces *r* pivoted to the insulated casting, serving to conduct the electric current to the upper carbon and to engage the groove of said carbon when the latter descends the required distance, substantially as and for the purposes described.

4. In an arc-lamp, the combination of the regulating-solenoid *c*, the casting *a*, the upper carbon *i* having the groove *t*, the frame *m* holding the glass *n*, and the casting *o* secured and insulated in the upper end of the glass-holding frame and provided with a series of pivoted, electric contact-pieces *r* serv-

ing to conduct the current to the upper carbon, making electric contact therewith and engaging the groove in said carbon when the latter descends the required distance, substantially as and for the purposes described.

5. In an arc-lamp, the combination with the regulating-solenoid, the movable armature, the upper carbon having the groove *t*, and suitable carbon clutch devices, of the glass-holding frame *m*, the glass *n* in the latter, and the casting *o* insulated in the upper end of said frame and provided with the glass-closing disk *p* and a series of pivoted, electric contact-pieces *r* making electric contact with the upper carbon and engaging the groove in said carbon when the latter descends the required distance, substantially as and for the purposes described.

6. In an arc-lamp having the upper carbon provided with an annular groove in its upper end portion, the combination of an insulated casting or support, with a series of electric contact-pieces *r*, pivoted to said insulated support, serving to conduct the current to the upper carbon and engaging the said annular groove when the carbon descends sufficiently, substantially as and for the purposes described.

7. In an arc-lamp, the combination of the casting *a* formed integral with an upper looped part *b*, the regulating-solenoid *c* arranged in said looped part, an upper carbon *i*, a cylinder *l*, connected to and insulated from the lower end part of said casing, a frame *m* supporting the lower carbon and the glass *n* and suspended from said cylinder, and a casting *o* insulated in the upper end of the lower-carbon-supporting frame and provided with pivoted, electric contact-pieces *r* and a disk *p* which closes the upper end of said glass, substantially as and for the purposes described.

8. In an arc-lamp the combination of the casting *a* formed integral with an upper looped part *b*, the regulating-solenoid *c* arranged in said looped part, an upper carbon *i*, a cylinder *l* connected to and insulated from the lower part of said casting, radial ribs *v* on said cylinder carrying insulating-plates to each having a plurality of notches, a resistance-coil composed of a flat thin metal band wound in said notches, and a frame *m* supporting the lower carbon, suspended from said cylinder *l*, and carrying insulated therefrom, a casting *o* with contact-pieces *r* and disk *p* for closing the upper end of the glass, substantially as and for the purposes described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

W. CLAUDE JOHNSON.  
ADOLPH WUNDERLICH.

Witnesses:

GERALD L. SMITH,  
E. GARDNER.