

No. 692,470.

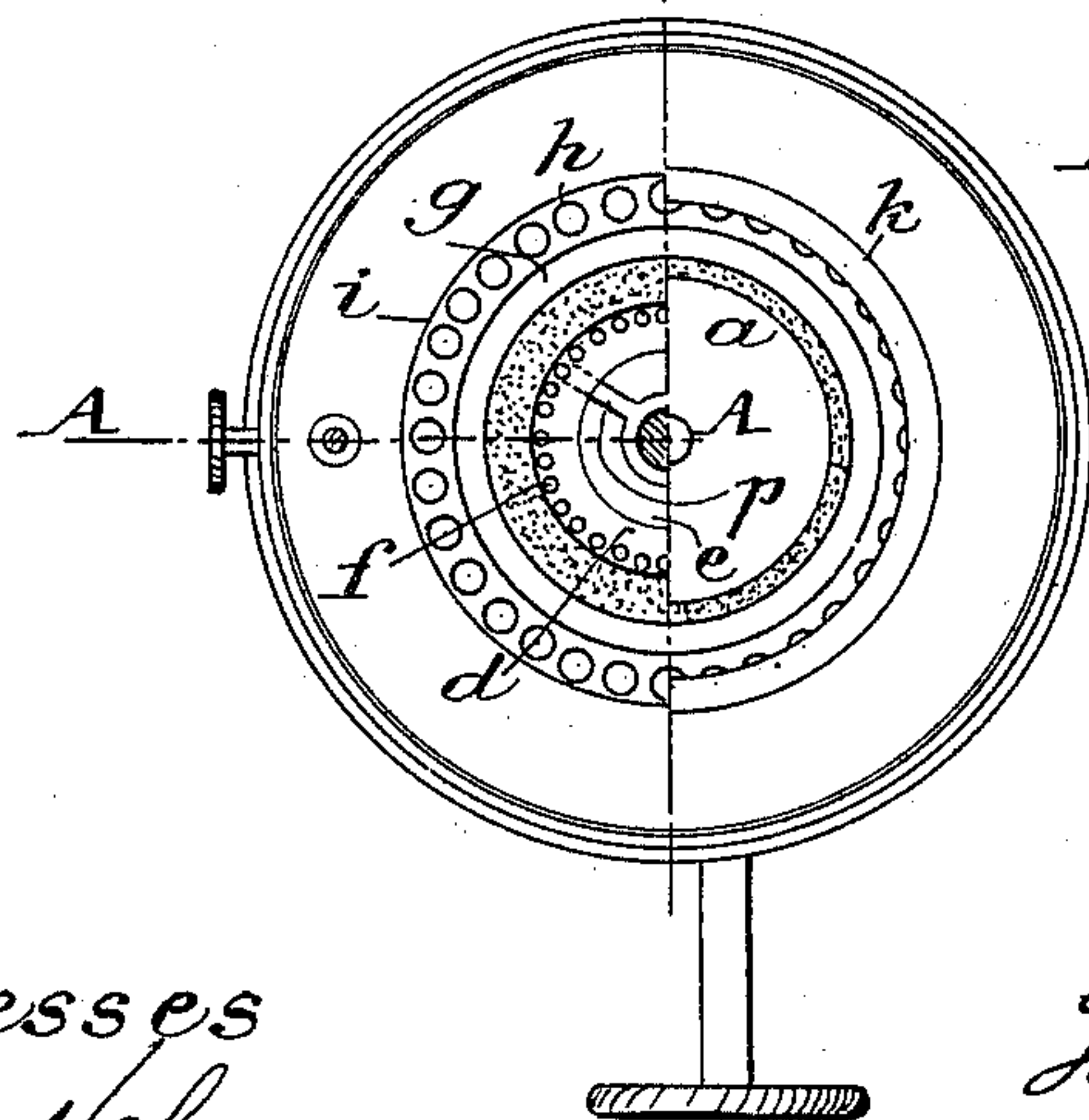
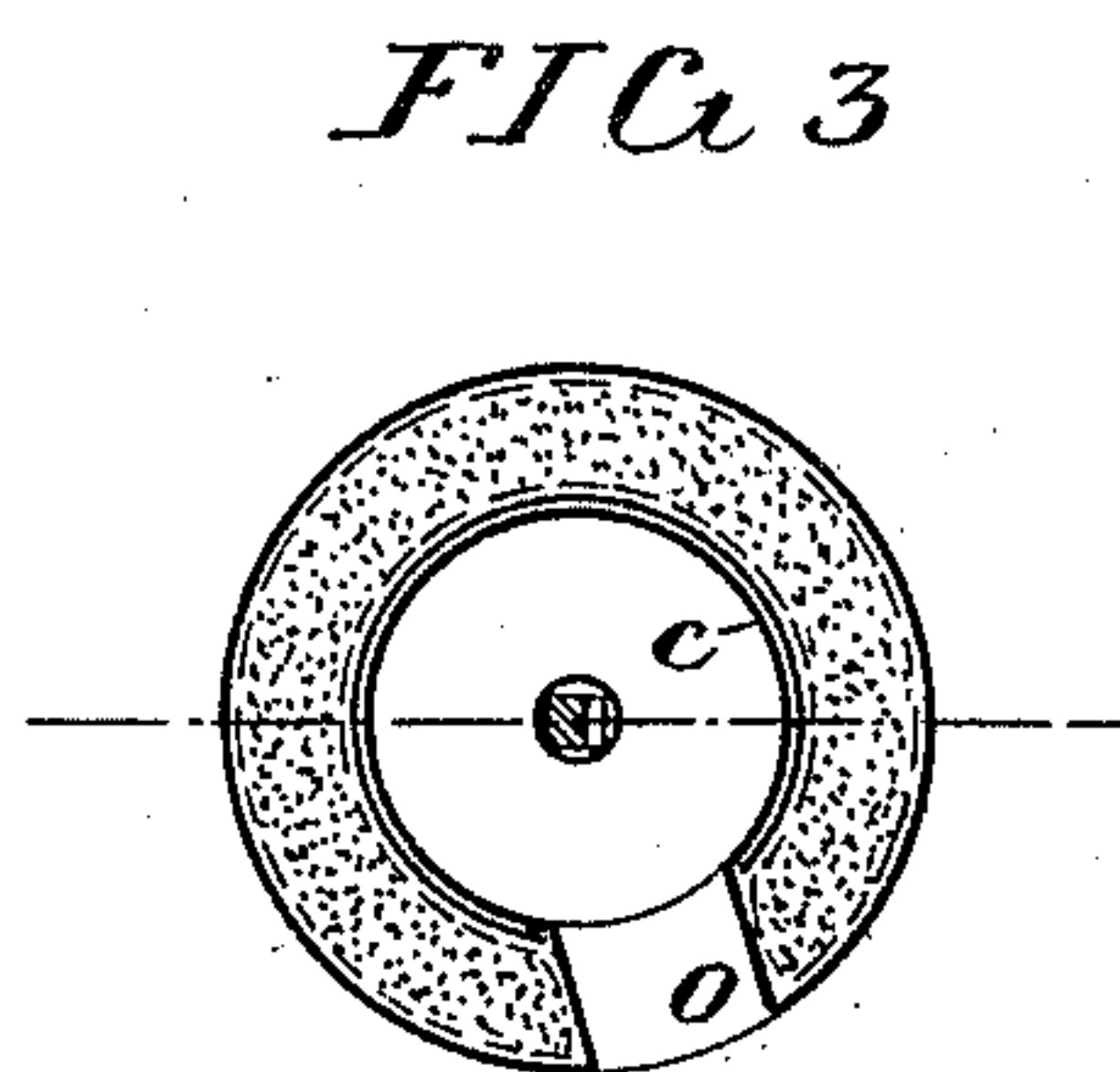
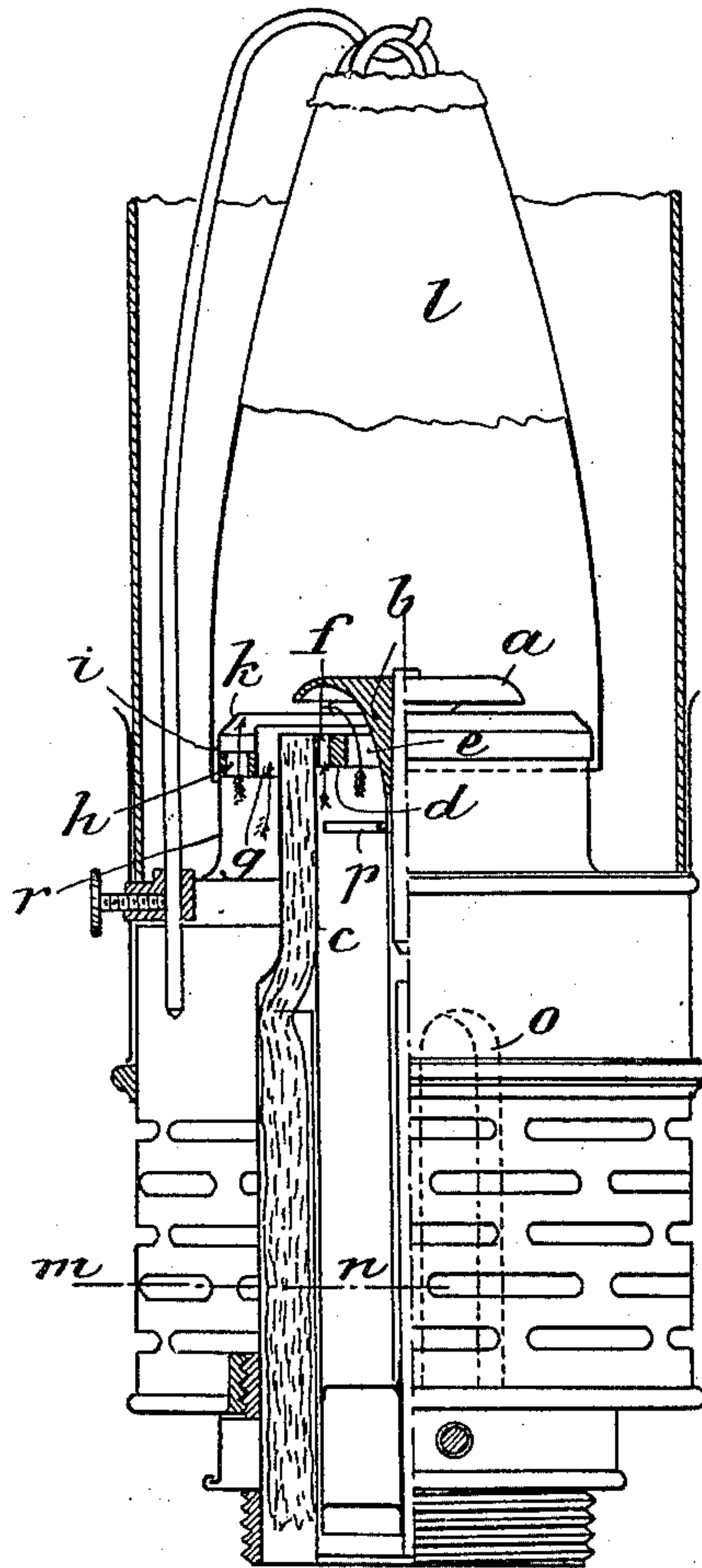
Patented Feb. 4, 1902.

L. C. NIELSEN.

BURNER FOR OIL LAMPS HAVING INCANDESCENT MANTLES.

(Application filed May 26, 1900.)

(No Model.)



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BURNER FOR OIL-LAMPS HAVING INCANDESCENT MANTLES.

SPECIFICATION forming part of Letters Patent No. 692,470, dated February 4, 1902.

Application filed May 26, 1900. Serial No. 18,148. (No model.)

To all whom it may concern:

Be it known that I, LARS CHRISTIAN NIELSEN, constructor, of Kong Georgsvej 12, Frederiksberg, near Copenhagen, in the Kingdom of Denmark, have invented certain new and useful Improvements in or Relating to Burners for Oil-Lamps Having Incandescing Mantles, (for which I have applied for patents in Denmark on the 12th of December, 1899, No. 1,349; in Germany on the 16th of December, 1899, No. 5,002; in England on the 20th of December, 1899, No. 25,260; in Austria on the 23d of December, 1899; in Russia on the 15th of December, 1899, No. 9,763; in Hungary on the 23d of December, 1899, No. 19,463; in Sweden on the 5th of May, 1900, No. 750; in Norway on the 5th of May, 1900, No. 12,493, and in France on the 7th of May, 1900, No. 288,262,) of which the following is a specification.

This invention relates to improvements in burners for oil-lamps, and is especially applicable to those in which incandescing hoods or mantles are employed.

The improved burner belongs to the class in which the air required for the complete combustion of the oil-vapors is conducted partly inside the wick-tube and partly outside and around the same.

After long and minute trials I constructed this improved burner, in which the disadvantages connected with this class of lamps—as, for example, the smoke issuing from them and the noise caused by the flame—are avoided, partly by making the evaporation of the oil (which is usually hydrocarbon) as uniformly and regularly as possible over the whole burning-surface of the wick and partly by conducting the air to the wick and to the flame in such a manner that the feeding becomes completely homogeneous (regular) and free from lines or irregularities, which latter are apt to occur when the current of air is stronger in one place than in another. The air when passing through narrow channels or when flowing over solid rims or edges always causes the formation of such lines or irregularities, of which the disadvantages mentioned before are chiefly the consequence.

In the present improved burner the uniform and regular generating of the hydrocarbon vapors is obtained by the generator

described below, and the homogeneous (regular) feeding of the air is effected by the formation of resultant currents of air and by the proper application of the same. When two or more currents of air are caused to cross one another, another current is formed, which in respect of its direction and strength may be considered as the resulting current of the different original currents; but the irregular air-lines of the original currents will be considerably effaced in the resulting current, so that it is practically homogeneous, (regular.) If, however, the feeding with air is effected only by such homogeneous resulting currents, the mixture of the air and the oil-vapors must be at all points of the burner much more uniform than would be the case if the feeding takes place with ordinary currents of air, and also the combustion of such a mixture is in said case of a much quieter and more complete nature. That this is not only true in theory, but also practically, must be acknowledged when considering the present burner, in which the vapors of the hydrocarbon are inclosed within two resulting currents of air, each of which emanates separately, one of them inside the wick-tube, the other outside it, by which means is obtained an absolutely quiet and uniform light. It is of great importance that the resulting currents are procured immediately at the flame, for if they have a way to flow after their having been procured they will lose that for resulting currents peculiar character and operate as common air-currents.

The invention is illustrated in the drawings accompanying the specification, in which—

Figure 1 represents a side view of the burner, right-half part being a vertical section after the line A A, Fig. 2. Fig. 2 shows in part a plan of the improved burner, part of which is represented in section. Fig. 3 is a horizontal section after the line *m m*, Fig. 1.

One part of the inner resultant current of air is formed by means of a solid body *a*, having the shape of a reversed cup, from the center of which is a downward extension *b*. This part *a b* terminates in a stem inserted in and fixed to a spider *p*, frictionally fitting in the tube *c*. The other part of the inner resultant current of air is formed by causing the

air to pass through a ring *d*, provided with channels and attached to the wick-tube. The atmospheric air which enters through an opening *o* passes through the wick-tube in an upward direction, and the ascending air-current is divided into two parts, one of which passes through the space *e* between the ring *d* and the extension *b* of the body *a*, which latter gradually leads the air from its vertical direction, so that it is deflected toward the outer side of the tube. Here said current is met by the second part of the ascending air-current, which has passed through the channels of the ring *d*. The resulting current thus formed by means of the meeting of the two parts feeds the wick with the air required by the burner as a completely homogeneous (regular) current of air, the velocity of which is so small that even a very weak flame will be able to withstand it. The said body *a* at the same time serves as a generator of the hydrocarbon vapors. This body, as will be seen, is situated immediately above the burning-surface of the wick, and it is bent with a sharp and accurately-turned edge directly over the said surface. This body is preferably produced on a lathe. When the lamp is lighted, the combustion of the hydrocarbon vapors takes place above said body or reversed cup *a*, and in spite of this latter being underneath the flame and of its not being caused to glow the resulting temperature is sufficiently high to cause the evaporation of the oil absorbed by the wick, such evaporation being caused by the heat radiating from the bottom of the said cup *a*. By reason of the accurate shape of the body *a* and its being placed directly above the flame the evaporation is effected in a very uniform manner over the whole burning-surface of the wick, even if irregularities exist upon this surface, and the evaporation will not be stronger than sufficient in proportion to the air-currents. During such use of the lamp the top of the wick forming its burning-surface is placed at the same level with the rim of the wick-tube.

The generation of the exterior resultant current of air is obtained by the following arrangement: A ring *i*, carried by the burner-frame *r* and provided with channels *h*, is arranged outside the wick-tube, and a space *g* is left free between this tube and the ring *i*. The atmospheric air ascends at the outer side of the wick-tube, where it is, however, divided into two currents, the one passing through the space *g*, the other ascending through the channels *h*. This latter current is deflected from its vertical direction by means of an inclined surface *k*, also carried by the burner-frame and situated directly above the channels *h*, so that said current is conducted toward the interior. Hence the exterior resultant current of air is formed by the meeting of the two original currents. This second resultant current of air also feeds the flame or light in a completely homogeneous (regular)

manner, yielding the air required for the combustion of the hydrocarbon vapors.

From this description it will be gathered that the oil-vapors generating above the rim of the wick are inclosed within the two resulting currents of air, and it therefore follows that even in case of irregularities occurring upon the burning-surface of the wick the evaporation of the oil is effected without allowing any vapors to escape, but that, on the contrary, all the vapors of the oil are absorbed by the currents of air. It will also be seen that the resulting main current of air being formed by the meeting of the different resulting currents is caused to take an upward direction in the interior of the burner, so that all combustible substances are brought into the hollow space *l* of the incandescent mantle when the combustion proper is going on. Thus the flame will burn above the part *b*, but not between this part and the wick, which is owing to the circumstance that the oil-vapors together with the air from the inner resulting current will form oil-gas, which only after being mixed with the outer resulting current forms a mixture that may be completely burned. By means of the said arrangements the end in view is fully attained, the currents of air and those of the vapors being limited and bound on all sides in such a manner that tongues of flame and the like are completely avoided and that the mantle is caused to become incandescent by means of an absolutely quiet and clear flame, similar to the class of gas incandescent light of the Welsbach type. When once the wick of the lamp is adjusted at the right level, any further regulation of same is superfluous. Even in the case of the mantle being injured the light has a quiet flame, it being only less bright than in the case where the mantle is intact. The heat generally produced by the lamp is not considerably higher than that of ordinary hydrocarbon-lamps having burners of the same size. The oil-reservoir of this improved lamp will not be raised to a higher temperature than that of ordinary lamps, and the lighting of the wick presents no difficulties.

All that has been said of the working of the improved burner has been proved by many experiments, the lamp having burned a whole day without any readjustment being required.

I am aware that most of the features above described are not new in themselves and have been used in numerous combinations. The present invention is limited to the definite combination described, whereby the above advantageous results are obtained.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

In a burner for an incandescent oil-lamp the combination with a wick-tube, through and around which air is supplied to the flame,

of a reversed-cup-shaped generator *a*, *b* fixed
within and overhanging said wick-tube, an
inner ring *d* provided with air-channels *f* and
fixed inside the wick-tube near its upper edge,
5 an outer ring *i* carried by the burner-frame
and surrounding the upper end of the wick-
tube, air-channels *h* in said outer ring *i* and
an inclined deflector *k* carried by the burner-

frame and placed over the channels *h*, sub-
stantially as and for the purpose set forth. 10

In witness whereof I have hereunto set my
hand in presence of two witnesses.

LARS CHRISTIAN NIELSEN.

Witnesses:

MARCUS MOLLER,
MAGNUS JENSEN.