

No. 850,752.

PATENTED APR. 16, 1907.

H. HEIDORN.
REGULATOR FOR MANTLE FIRING FLAMES.

APPLICATION FILED JAN. 21, 1905.

3 SHEETS—SHEET 1.

Fig.1.

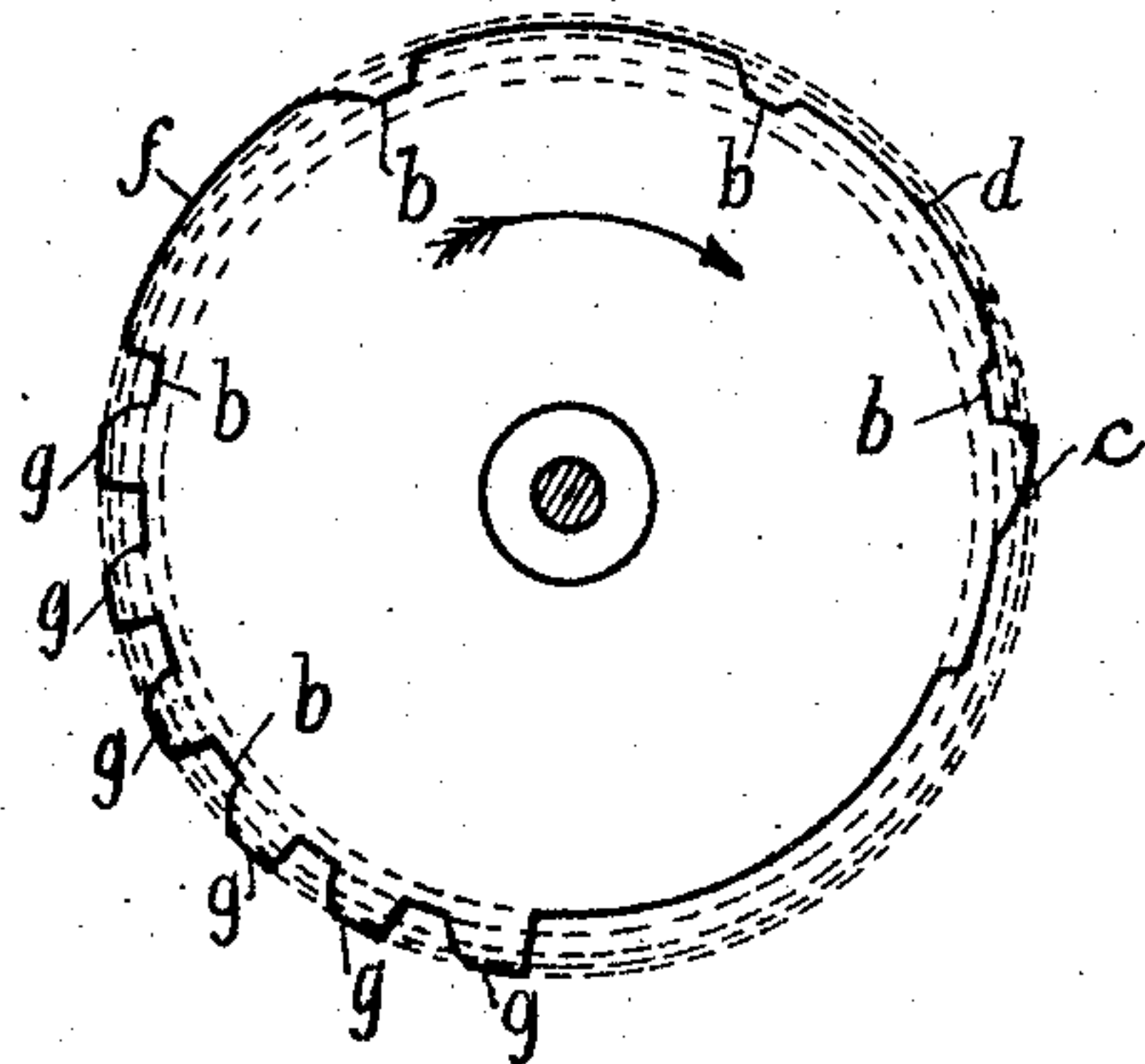


Fig.2.

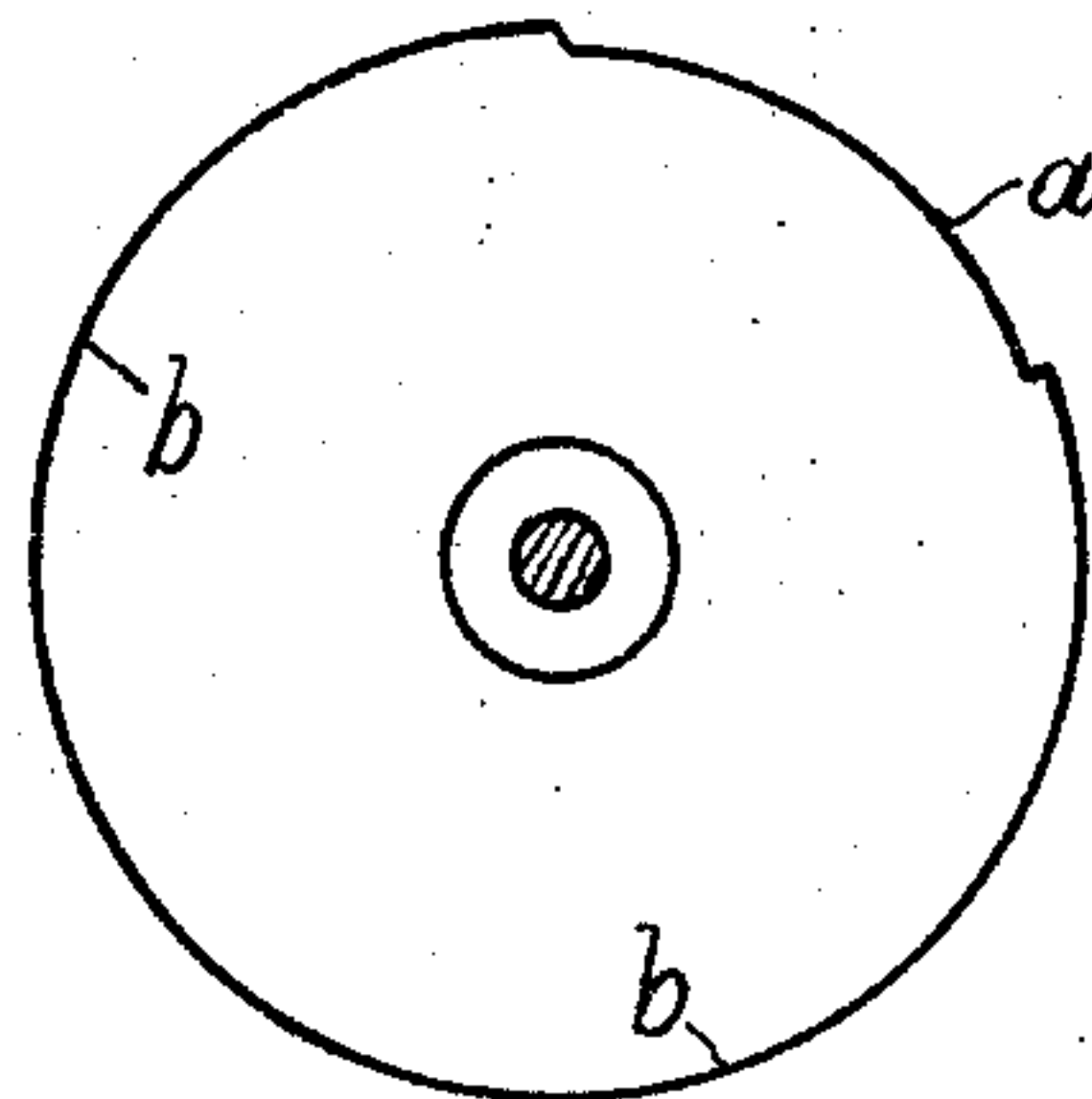


Fig.3.

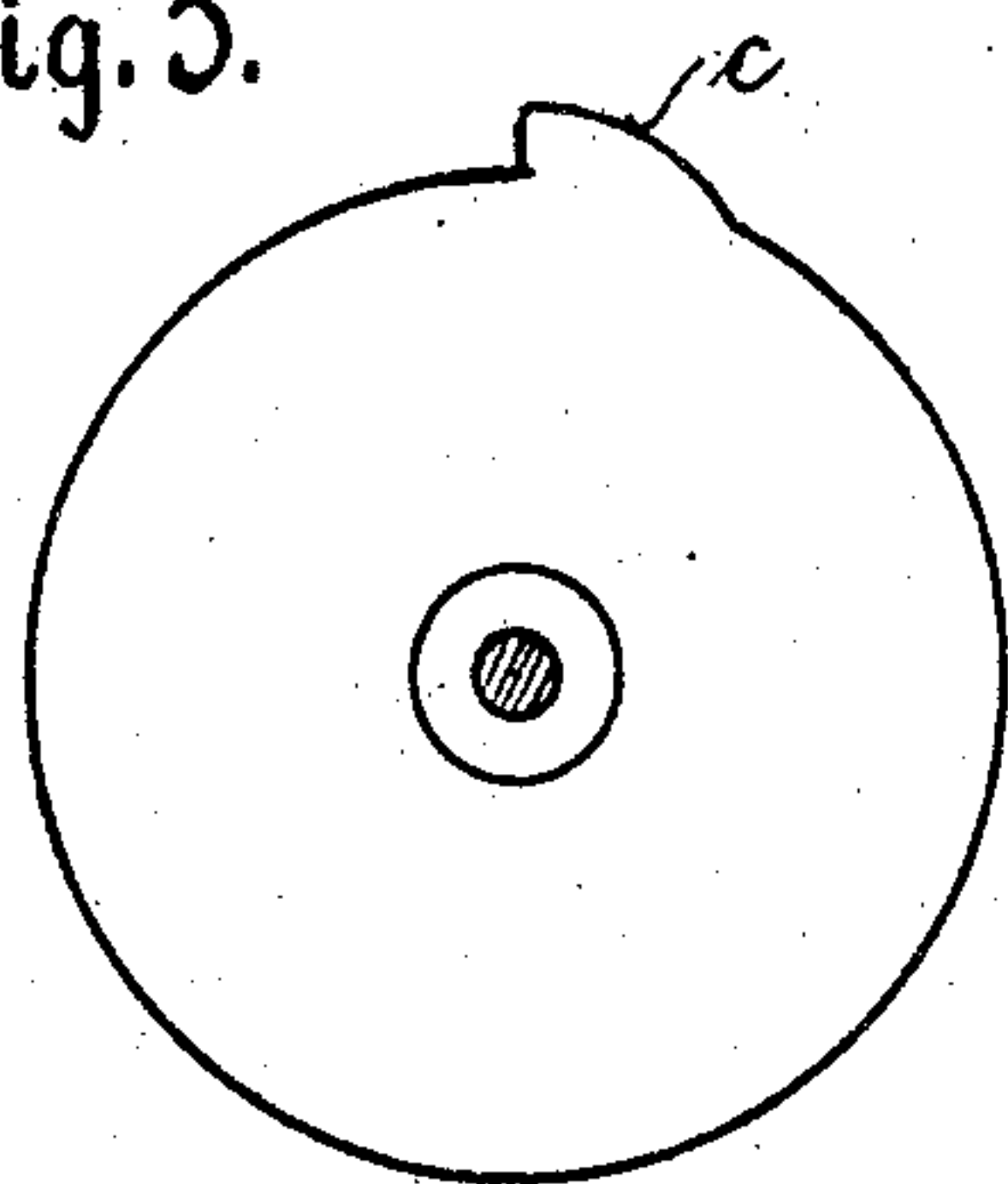


Fig.4.

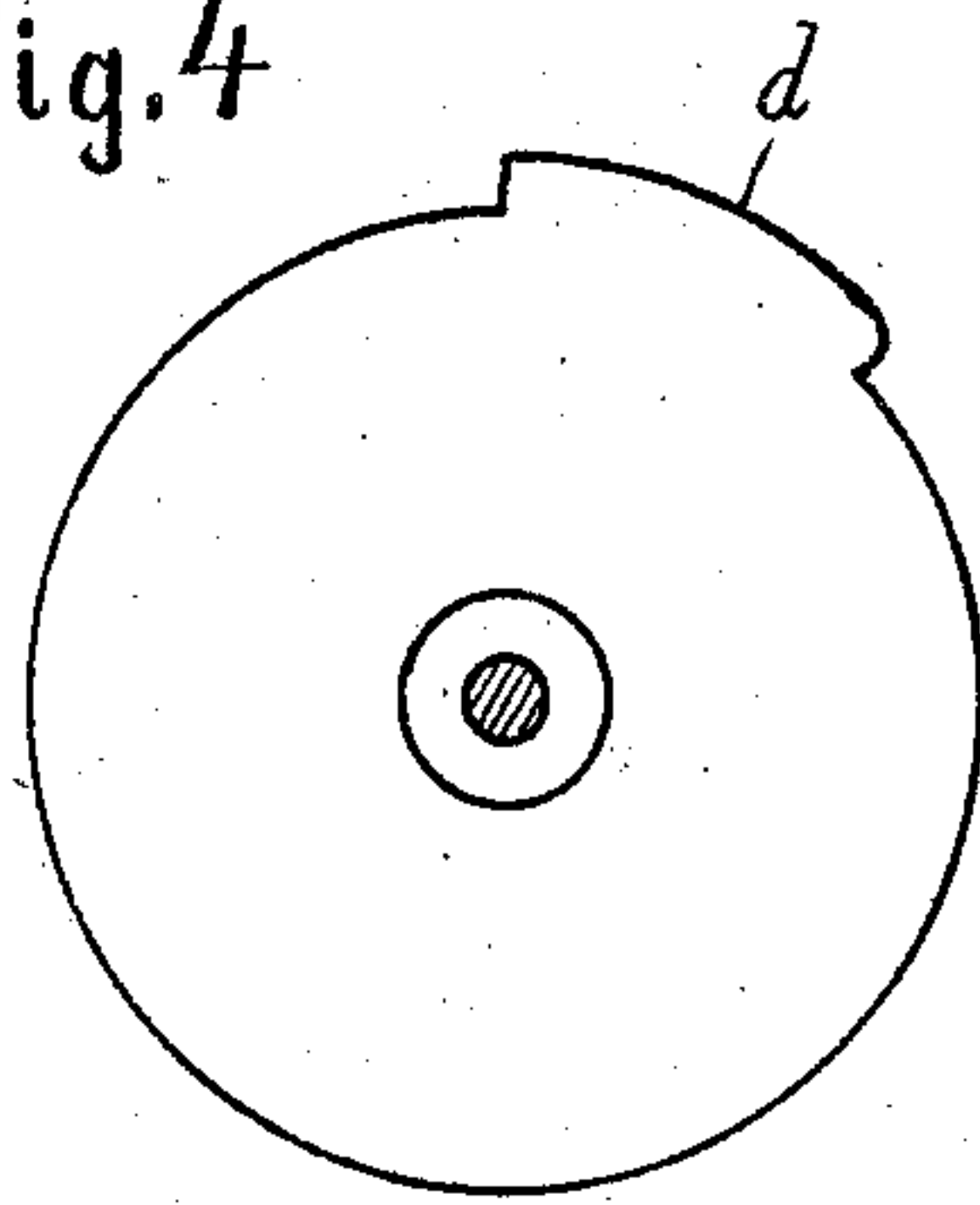


Fig.5.

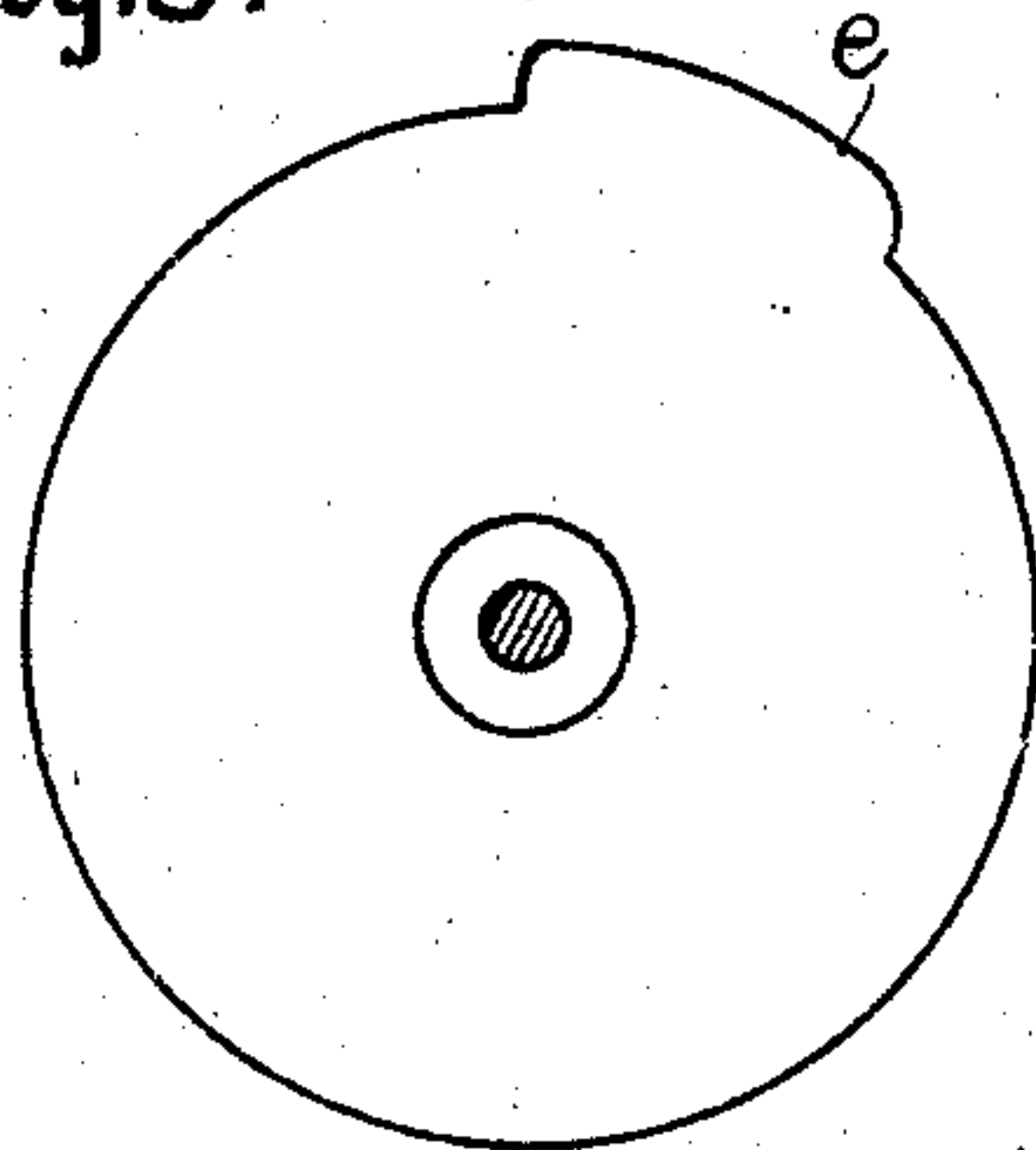
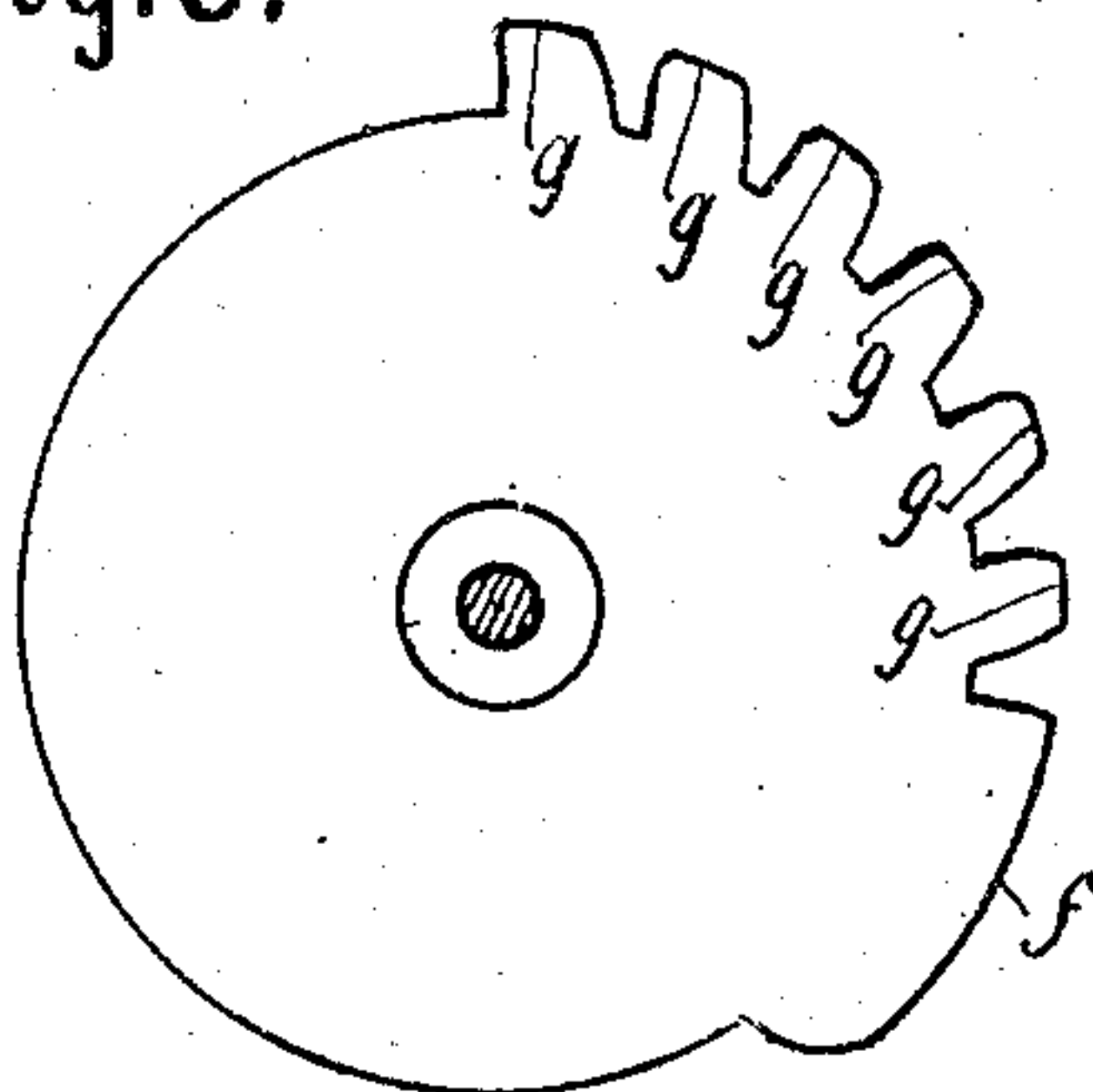


Fig.6.



Witnesses:
Her. Heinicke
J. Franke.

Inventor
Hugo Heidorn
by G. Dittmar
Attorney

No. 850,752.

PATENTED APR. 16, 1907.

H. HEIDORN.
REGULATOR FOR MANTLE FIRING FLAMES.
APPLICATION FILED JAN. 21, 1905.

3 SHEETS—SHEET 2.

Fig. 7.

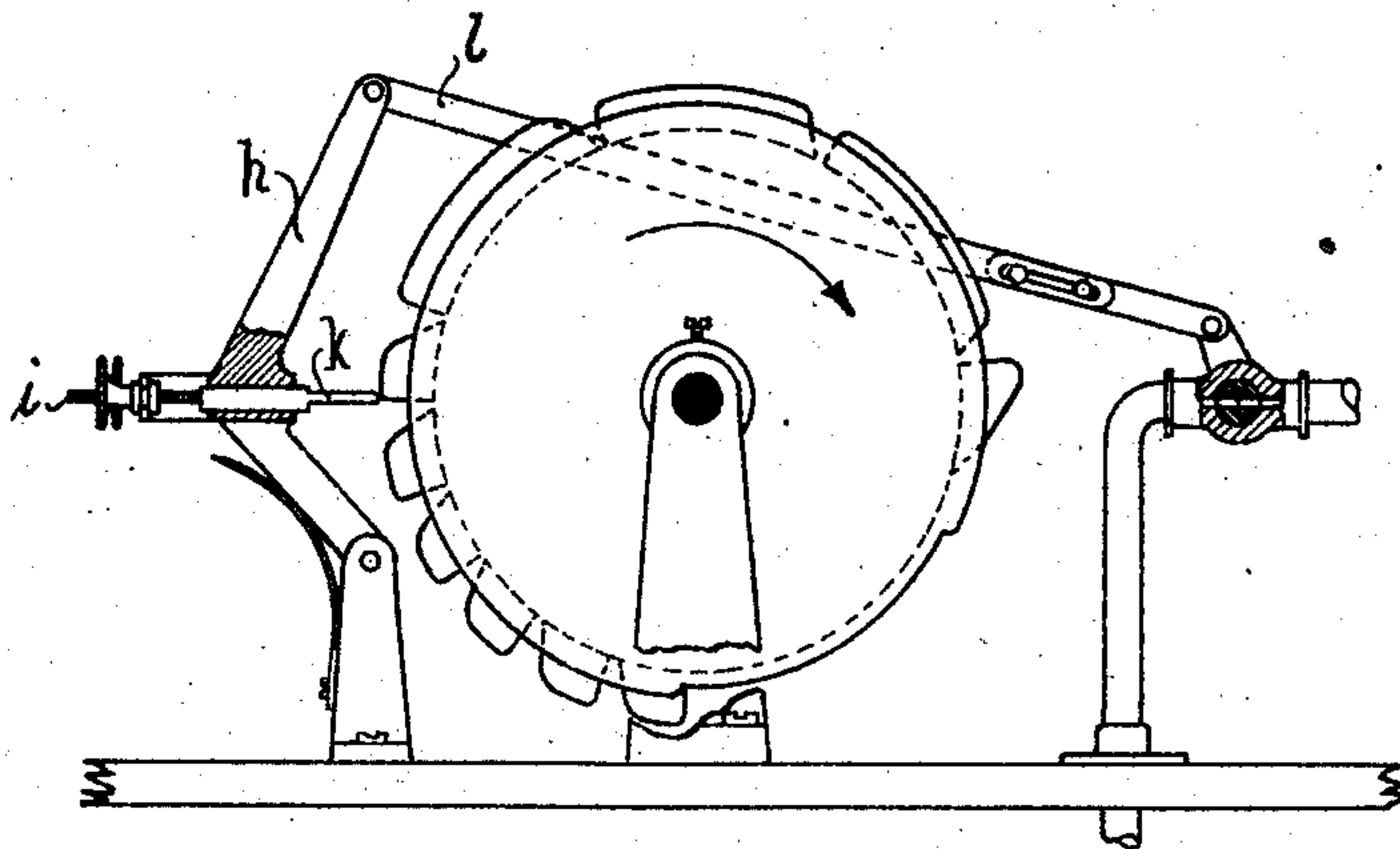
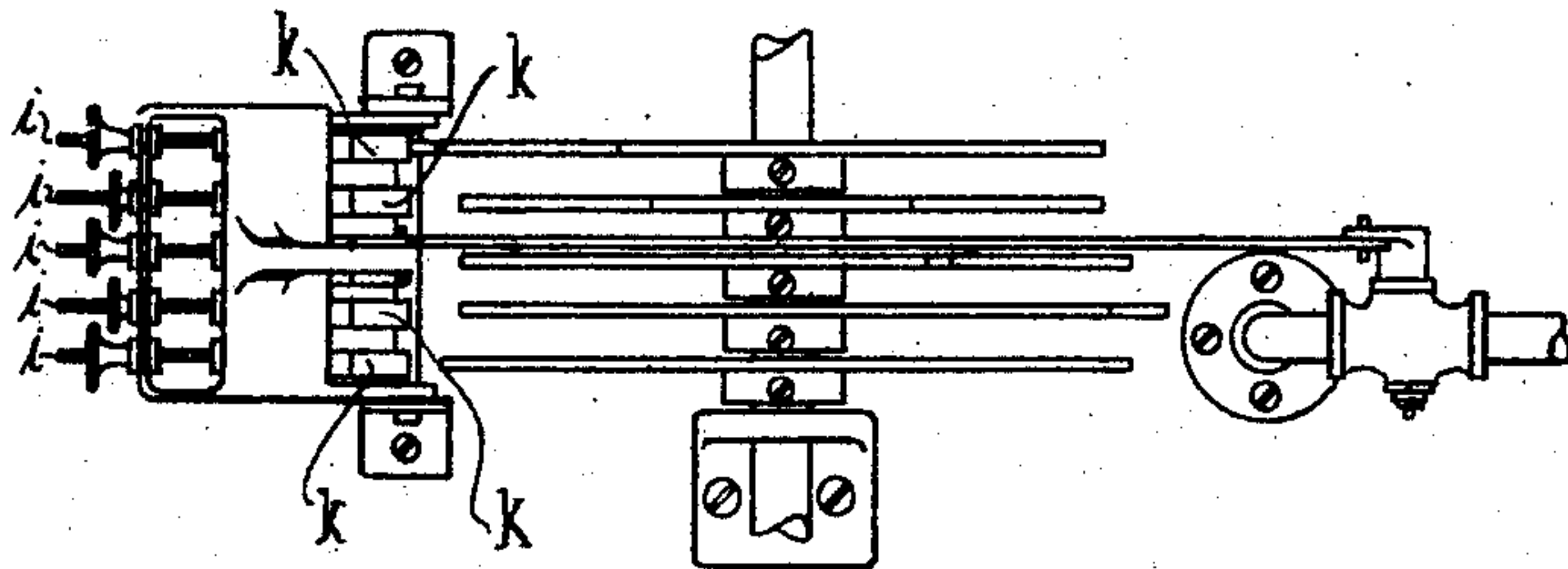


Fig. 8.



Witness:
Geo. Henrich
J. Spawke.

Inventor:
Hugo Heidorn
By G. Dittman
Attorney.

No. 850,752.

PATENTED APR. 16, 1907.

H. HEIDORN.
REGULATOR FOR MANTLE FIRING FLAMES.

APPLICATION FILED JAN. 21, 1905.

3 SHEETS—SHEET 3.

Fig. 9.

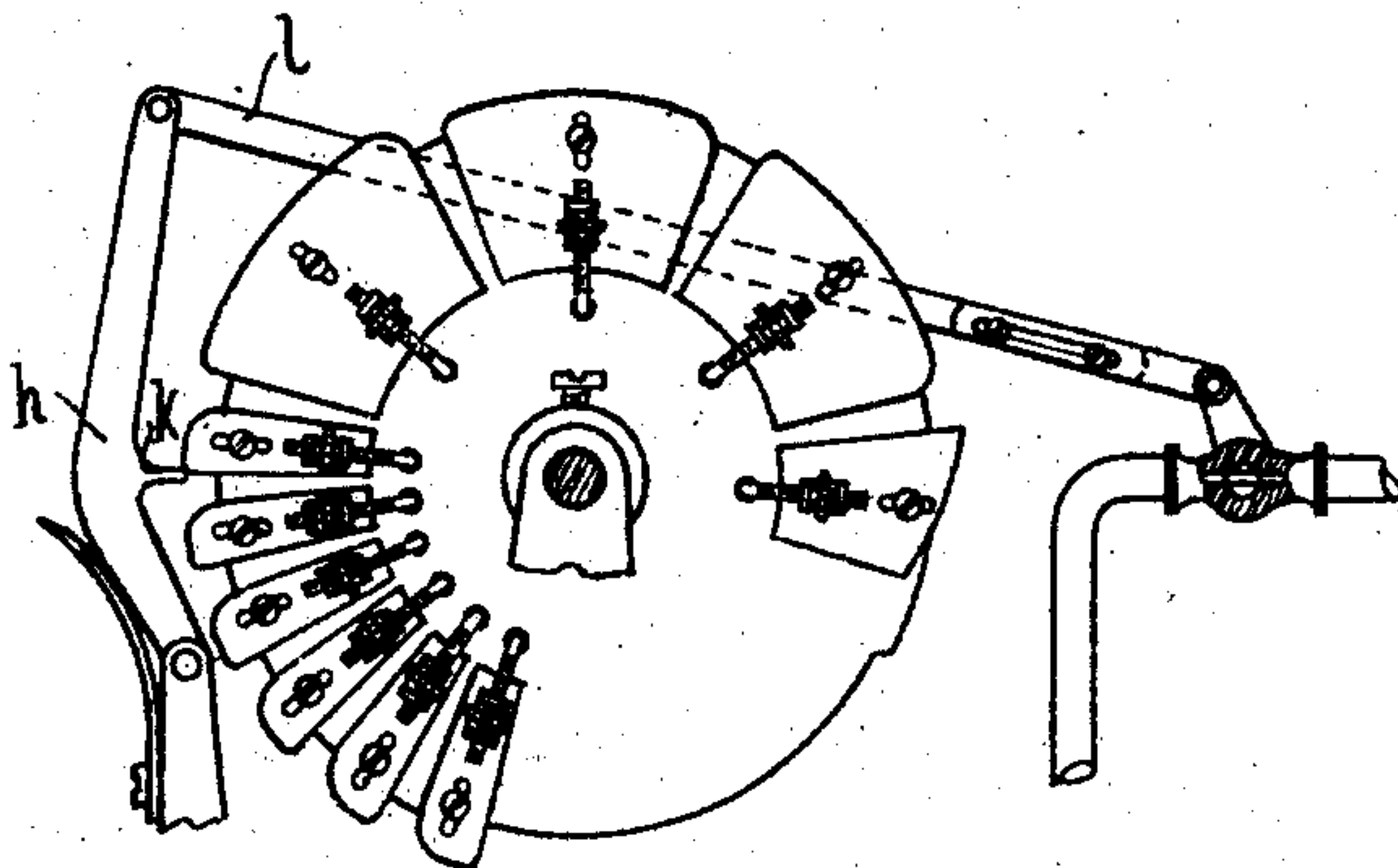


Fig. 11.

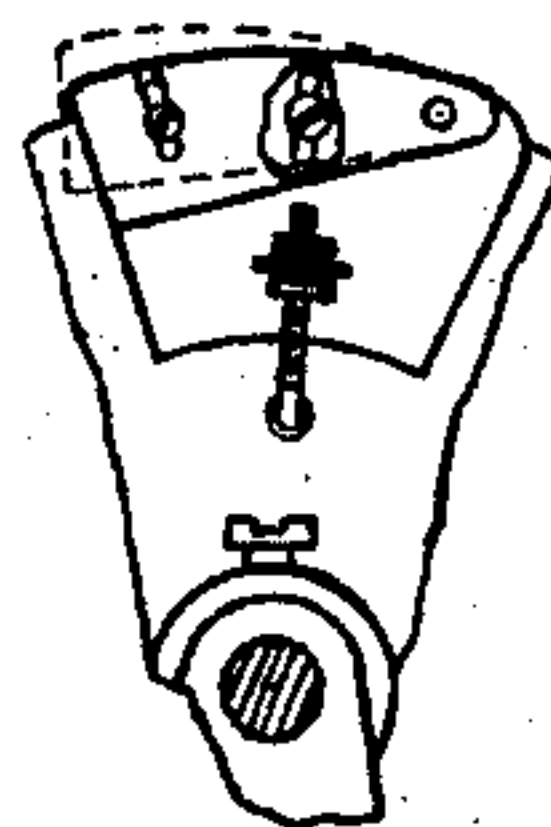
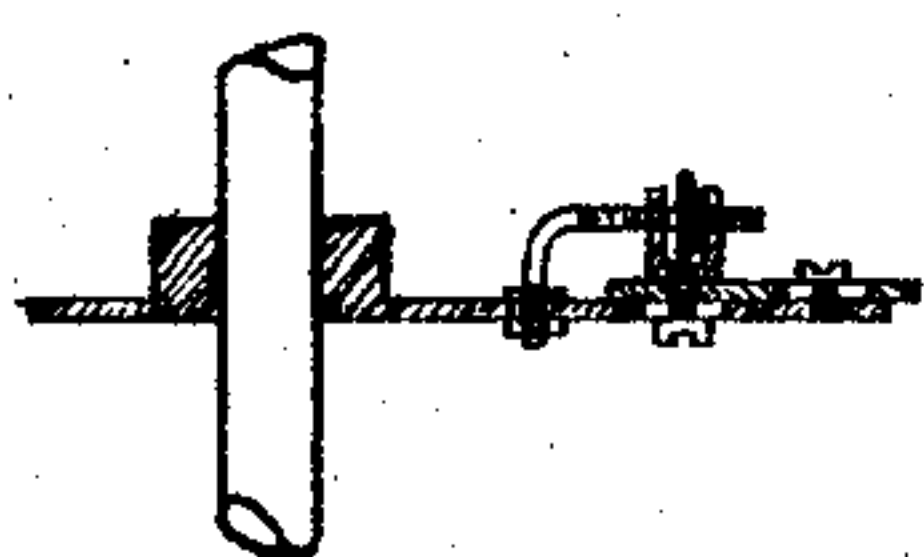


Fig. 10.



Witnesses:
Geo. H. H. H.
S. Sprauke.

Inventor:
Hugo Heidorn
by G. Sittman
Attorney

UNITED STATES PATENT OFFICE.

HUGO HEIDORN, OF HAMBURG, GERMANY.

REGULATOR FOR MANTLE-FIRING FLAMES.

No. 850,752.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed January 21, 1905. Serial No. 242,148.

To all whom it may concern:

Be it known that I, HUGO HEIDORN, a subject of the Emperor of Germany, residing in Hamburg, in Germany, have invented new and useful Improvements in Regulators for Mantle-Firing Flames, of which the following is a specification.

This invention relates to a device for regulating the strength of the flame in the different stages in machines for firing incandescent mantles. The invention is based on the observation that the impregnated mantles, of which the incandescent bodies are formed, require special treatment by means of the tempering-burner, according to the degree in which they are impregnated and dried and the nature of the fabric—in fact, the strength of the flame in the different phases of the tempering must be varied in order to produce the best kind of incandescent bodies.

Machines for firing incandescent bodies are already known in which the admission of the gas to the tempering-burner is regulated by means of cam-disks. The different cams on the disk or several disks, arranged one behind the other, are the means whereby the different stages of the flame are created, the admission of gas during the stages thus created being varied by the differences in the height of the cams. The cam-disk which is made in accordance with experiments carried out with specially-impregnated mantles has been considered hitherto as suitable for firing incandescent bodies of every kind. This is, however, a great mistake, which may well be the cause of these firing-machines not proving satisfactory. The different natures of the gases, the varying pressure of the same, these being unavoidable differences, cause disturbances in working even when the particular nature of the fabric and the degree in which the impregnation and drying of the fabrics are carried out render it possible to employ the machine with the precisely-formed cam-disk. If in addition there be differences in the fabric and in the impregnation and drying of the mantle, the waste when the mantles are fired with such machine is so great that it is preferable to employ the hand-labor of experienced workmen. The careful experienced workman pays attention to the nature of the different mantles which he has to treat. As a rule, he can remedy the defects therein by means of the tempering-flame. When the firing is effected by means

of the machine, the different stages of the flame and the development of the flame up to its greatest power must be so regulated beforehand that when the tempering is effected no defects remain.

If it be desired to alter the strength of the flame in existing firing-machines, in which the admission of gas is regulated by means of cam-disks, this can only be effected simultaneously for all stages of the flame, apart from the alteration each time of the sliding surfaces for the different cams by means of "slip-loops," &c. However, in order to regulate the strength of the flame properly for all stages when the tempering is effected it must be possible for the strengthening and weakening of the flame to be effected independently for the different stages.

The means employed in the present invention for adjusting the flame for the different stages, each of which corresponds to a cam or a number of cams together, so that the different stages of the flame can be adjusted independently of one another, consists in the introduction, between the shaft of the cam-disk and the lever-arm by means of which the opening of the gas-cock is effected, of an adjusting-screw for each stage of the flame. The adjusting-screw can, for example, be arranged so that the slide-pin on the lever can be lengthened or shortened. In this case every cam must have a special slide-pin not belonging to one stage of the flame, and thus lying in different planes, for example, on different separate disks which are seated on the same shaft. The adjusting-screw, however, may also be arranged between the radially-adjustable cams and the disk. In this case the different cams may be on different disks, as also on a single disk.

Thus, as will be seen from the foregoing general explanation, the invention consists in the possibility of altering the strength of the flame for the different stages independently for each stage by means of an adjusting-screw arranged in a suitable place, by means of which the removal of the lever-arm from the shaft is rendered unnecessary. The importance of the invention consists in the fact that by these means the development and strength of the flame can be most precisely regulated at any time for each phase of the forming and tempering operation.

In the accompanying drawings two forms of the invention are illustrated.

Figure 1 is a diagrammatic view showing the forms of the different cams of a cam-disk, and the relative proportions of the highest degrees of intensity of the flame. Figs. 2, 3, 4, 5, and 6 show the forms of different cam-disks to be wedged side by side on the same shaft. Fig. 7 is a side elevation of the device; Fig. 8, a plan of the same. Fig. 9 is a side elevation of a modification. Fig. 10 is a transverse section, and Fig. 11 a side elevation, of an adjustable cam.

In Figs. 2, 3, 4, 5, 6 the cam-disk is resolved into five different disks. In Fig. 2 the periphery is recessed in the place where the flame is not used. The height of the remaining part of the periphery is such that the gas burns with the smallest flame. In Figs. 3 to 6 each disk has a cam, and in Fig. 6 a number of cams together, each corresponding to a phase of the action of the flame of the tempering-burner on the incandescent body. The camless part of the disk in Figs. 3 to 5 is recessed like the recessed part in Fig. 2, so that no influence is produced by this part of the disk on the admission of gas to the tempering-burner.

a is the recessed part in the periphery, Figs. 1 and 2, corresponding to the phase during which the flame is not burning.

b is the part of the periphery of the device that supports the smallest flame, Figs. 1 and 2.

c is the cam on the disk that regulates the forming-flame, Fig. 3; *d*, Fig. 4, the cam by means of which the flame is regulated during the first tempering; *e*, Fig. 5, the cam for the second tempering.

f and *g*, Fig. 6, are the collection of cams, with similar strength of flame, for the third or final heating. Figs. 7 and 8 illustrate a form in which each cam or the cams belonging to one stage of the flame is on a special disk correspondingly to the disks illustrated in Figs. 2 to 6. The lever-arm *h* has five adjustable slide-pins *i i*, by means of which the slide-pins *k* can be adjusted for each appropriate disk, so that the distance of each disk between lever and shaft can be increased or reduced as desired within the limits under consideration. Each cam-disk only bears cams of one stage of the flame. Each stage is thus separately adjustable. The greater the length to which the slide-pin *k* is adjusted the higher is *h* raised by the particular cam and the gas-cock connected with the tempering-burner turned more on and the greater the strength of the flame in the particular stage. Inversely, the strength of the flame is less accordingly as the slide-pin *k* is adjusted to a shorter length. The rod *l* is arranged so that it can be lengthened or shortened.

The adjustment of the stages of the flame is effected by means of a single lever-arm in the manner illustrated in Figs. 7 and 8. This is possible, since only one cam for actuating the

arm of the lever is called into action at the time. Thus the cams act successively.

The adjusting-screw, which in this form of the invention is employed for adjusting the slide-pin, Figs. 7 and 8, may also be arranged to adjust a radially-adjustable cam. Hereby it is possible for the action of the cam on the lever-arm *h* and through this and the rod *l* on the gas-cock to be regulated by a single fixed slide-pin. In this case, however, the five disks, if the different cams are independently adjustable, could be combined in one disk, in which the projections lie in the same plane and act on the same slide-pin. The last-mentioned form of the invention is shown in side elevation in Fig. 9. The cam, Figs. 10 and 11, is not only radially but also tangentially adjustable, the upper part of the cam being made eccentrically rotative. The adjustable upper part of the cam can be firmly screwed as may be desired in any of the possible positions. Hereby, also, the strength of the flame for the different phases of the treatment of the incandescent body by the tempering-burner is varied. The adjusting device will be at once understood from Figs. 10 and 11 of the drawings.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a device for applying different degrees of flame intensity in machines for firing incandescent bodies, the combination with a plurality of cam-disks side by side on a common shaft, of a lever regulating the gas-cock of the burner, and of a number of adjusting-screws on said lever, each screw being in line with one of said cam-disks and being provided with means to adjust it with respect to the cams, for varying the different stages of the flame, substantially as described.

2. In a device for applying different degrees of flame intensity in machines for firing incandescent bodies, the combination with a cam-disk having different adjustable cams in one and the same plane, of a lever regulating the gas-cock of the burner having a fixed pin in line with the cam-disk and of cams on said disk being provided with means to adjust them on the disk radially, substantially as described.

3. In a device for applying different degrees of flame intensity in machines for firing incandescent bodies, the combination with a cam-disk having different adjustable cams in one and the same plane, of a lever regulating the gas-cock of the burner having a fixed pin in line with the cam-disk and of cams on said disk being provided with means to adjust them on the disk tangentially, substantially as described.

In testimony whereof I affix my signature.

HUGO HEIDORN.

In presence of—

E. H. L. MUMMENHOFF,
OTTO W. HELLMRICH.