

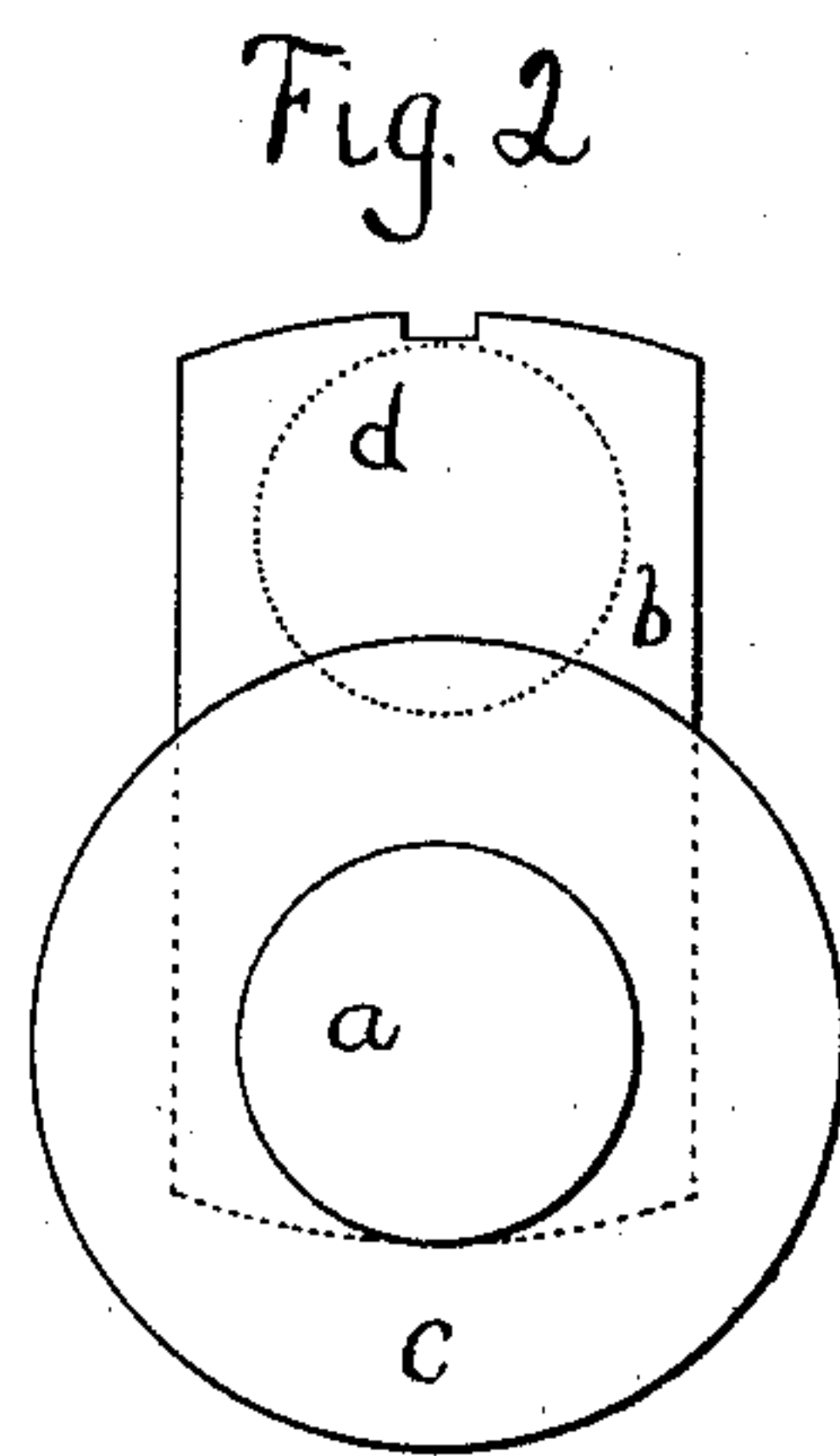
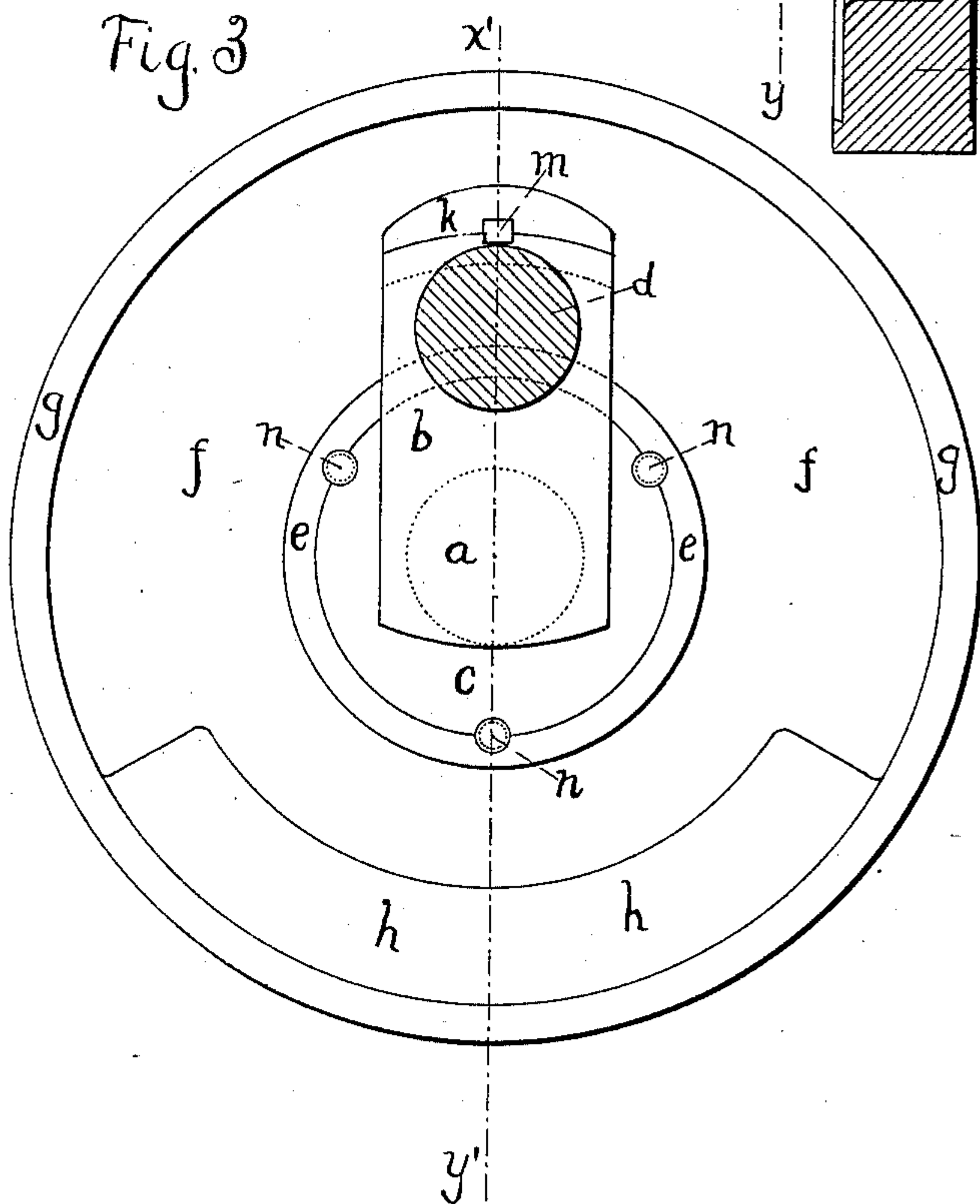
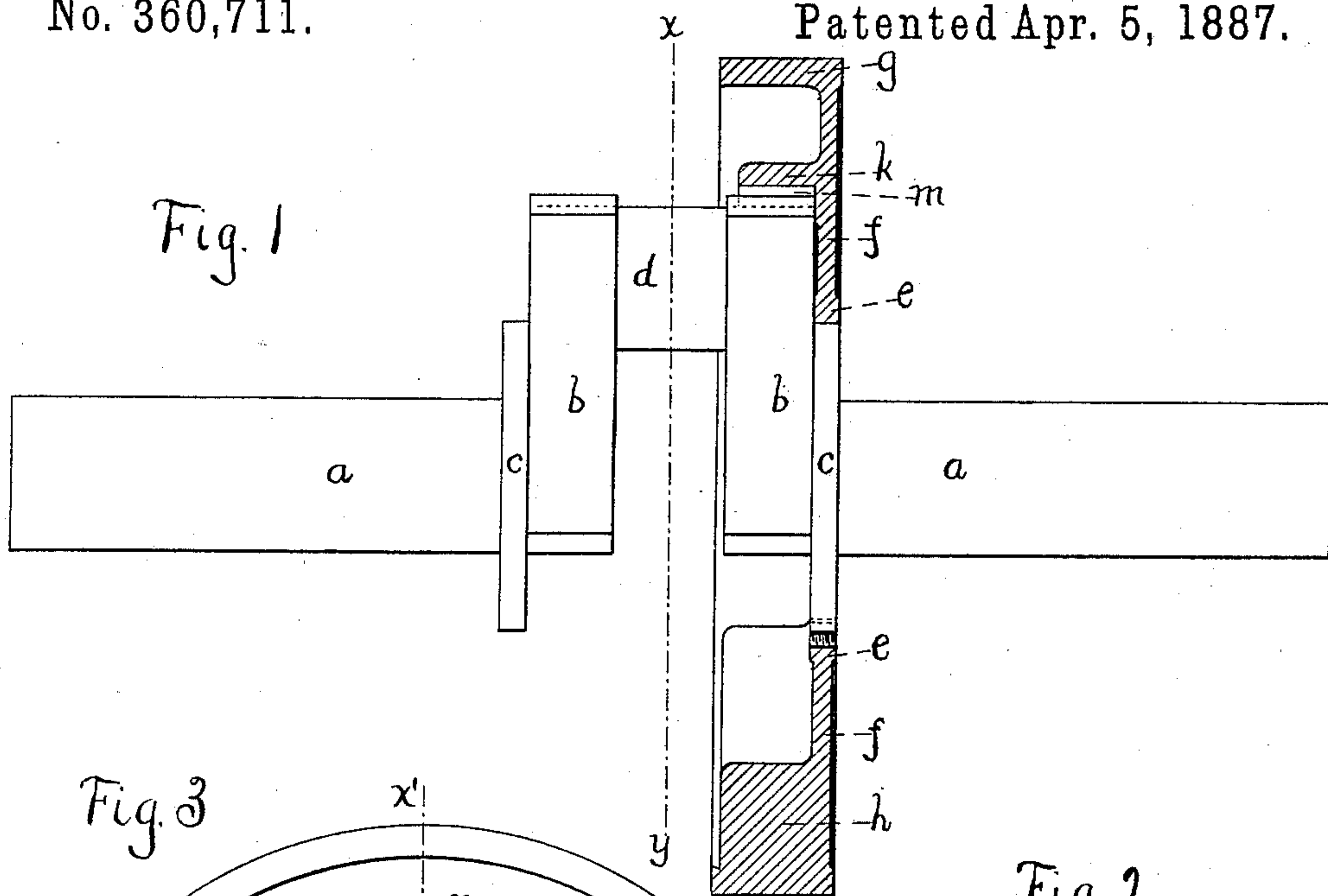
(No Model.)

J. E. McINTOSH.

ENGINE CRANK.

No. 360,711.

Patented Apr. 5, 1887.



Witnesses:  
*William P. Allen*  
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# UNITED STATES PATENT OFFICE.

JOHN E. McINTOSH, OF AUBURN, NEW YORK.

## ENGINE-CRANK.

SPECIFICATION forming part of Letters Patent No. 360,711, dated April 5, 1887.

Application filed February 10, 1887. Serial No. 227,135. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. McINTOSH, of the city of Auburn, State of New York, have invented certain new and useful Improvements in Engine-Cranks, of which the following is a description, reference being had to the accompanying drawings.

The object of my invention is to balance the reciprocating parts of an engine. This object is accomplished by means of a novel construction of the cranked axle of the engine and the combination therewith of a balancing-weight of novel construction, by means whereof the crank, crank-pin, and connecting-rod are effectually balanced with the least weight of metal and the construction of the above-mentioned parts much simplified in comparison with the devices heretofore used to produce a like effect.

In the drawings, Figure 1 is a side view of the cranked axle of an engine, showing the balancing-disk in section upon the line  $x'y'$  of Fig. 3. Fig. 2 is an end view of the cranked axle and collar thereupon; and Fig. 3 is an interior face view of the cranked axle, collar, and balancing-disk.

A cranked axle,  $ab dba$ , is formed with the collars  $cc$  concentric with the axle  $aa$  and adjacent to the crank  $bb$ . The collars are integral with the axle  $aa$  and crank-arms  $bb$ , and the peripheries of said collars are turned in a lathe to make a fit with the balancing-disk, which latter is bored to fit thereon, as shown in the drawings. The balancing-disks are two in number, and adapted to the collars  $cc$ , although one only is represented in the drawings. They consist of a hub,  $e$ , connected by a web,  $f$ , with a peripheral rim,  $g$ , of about the thickness of the crank-arms  $b$  and collars  $c$ . This peripheral rim is for appearance and for concealment of the crank simply.

The counterbalancing-weight  $h$  is cast solid with the web  $f$  and rim  $g$ , of which it forms a part, and the weights of both balancing-disks

are sufficient to balance the crank and connected reciprocating parts, as above mentioned. The disk  $f$  is provided further with a lug,  $k$ , upon the web thereof, opposite the weight  $h$ , which lug is finished to fit the end of the crank-arm  $b$ , and is secured thereto by a key,  $m$ .

Between the collar  $c$  and the hub  $e$  of the disk I insert the plugs  $nnn$  to further secure the disk, and these plugs are threaded, screwed to position, and cut off flush with the faces of the disk and collar, as shown in Fig. 1, whereby sidewise movement of the disk is prevented.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein-described crank-shaft, consisting of a shaft, crank-arms, crank-pin, and collars concentric with the shaft, all integrally constructed, in combination with independent balancing-disks mounted upon said collars, substantially as described.

2. The combination of the shaft, crank-arms, crank-pin, and collars concentric with the shaft, all integrally constructed, with balancing-disks mounted upon the concentric collars, and having their rims concentric with the shaft, substantially as described.

3. The shaft, crank-arms, crank-pin, and concentric collars, in combination with balancing-disks provided with lugs  $k$ , fitted to the end of the crank-arms and secured thereto by the key  $m$ , substantially as described.

4. The shaft, crank-arms, crank-pin, and concentric collars, all integrally constructed, in combination with balancing-disks fitted upon said concentric collars and secured thereupon by the screw-threaded plugs  $nnn$ , substantially as described.

JNO. E. McINTOSH.

Witnesses:

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