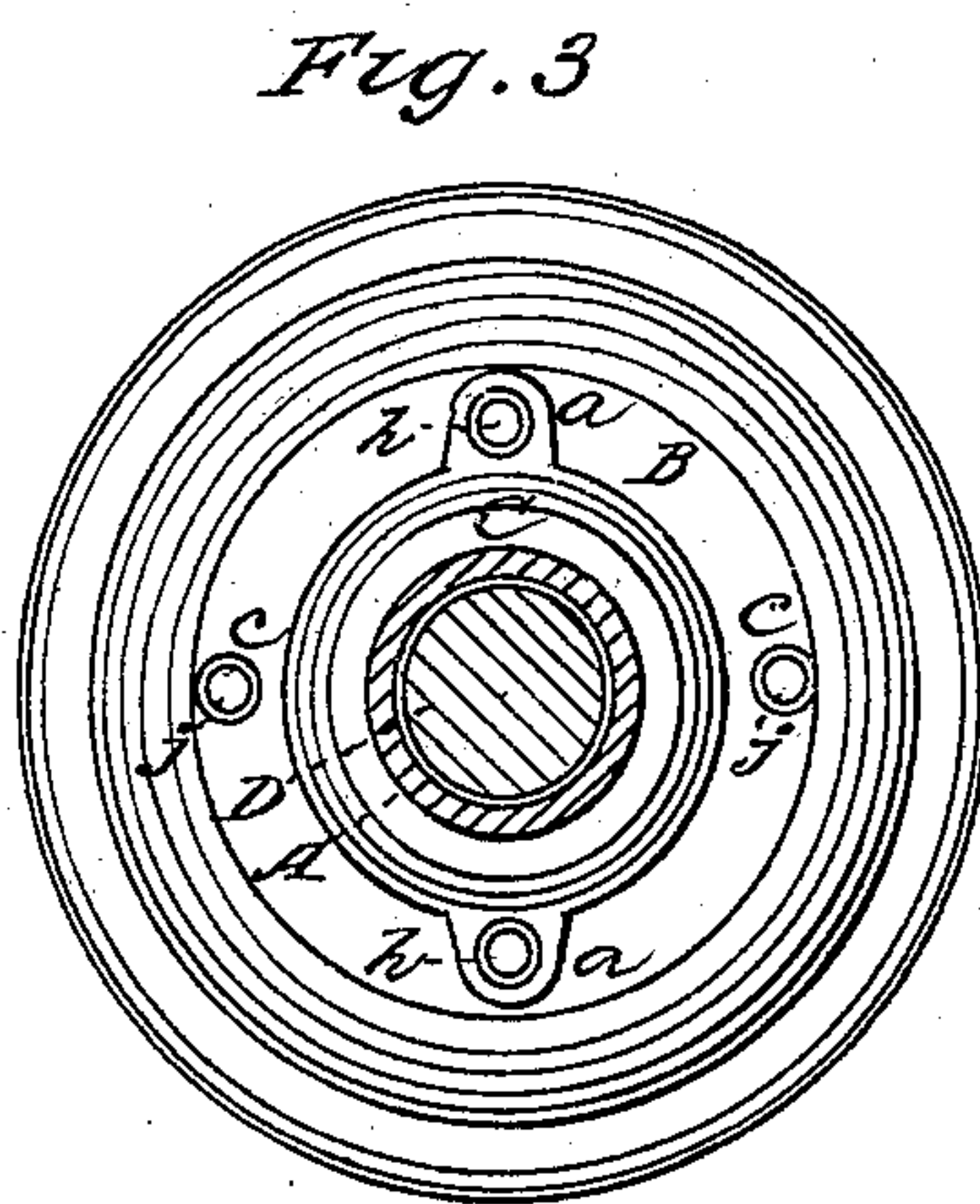
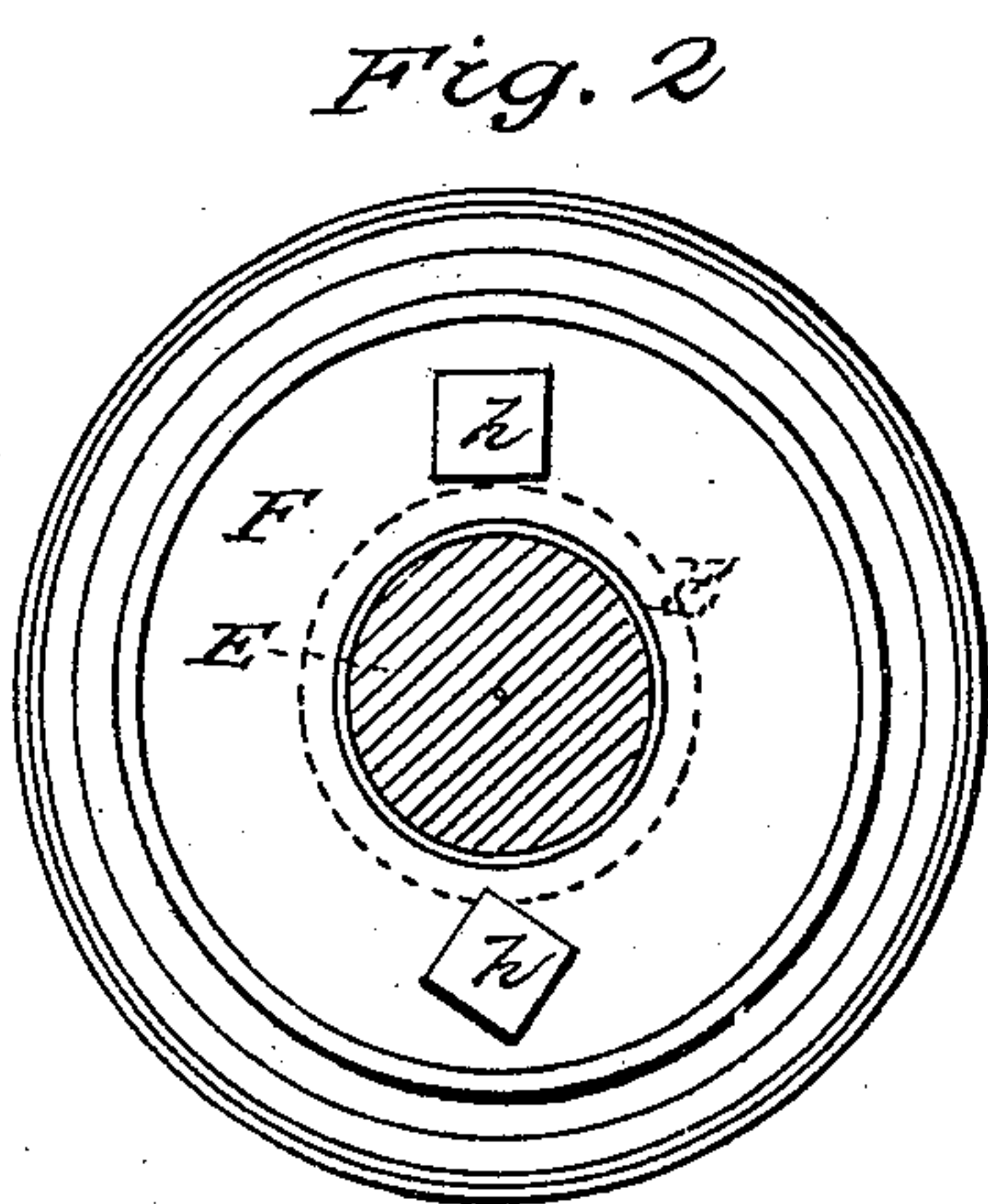
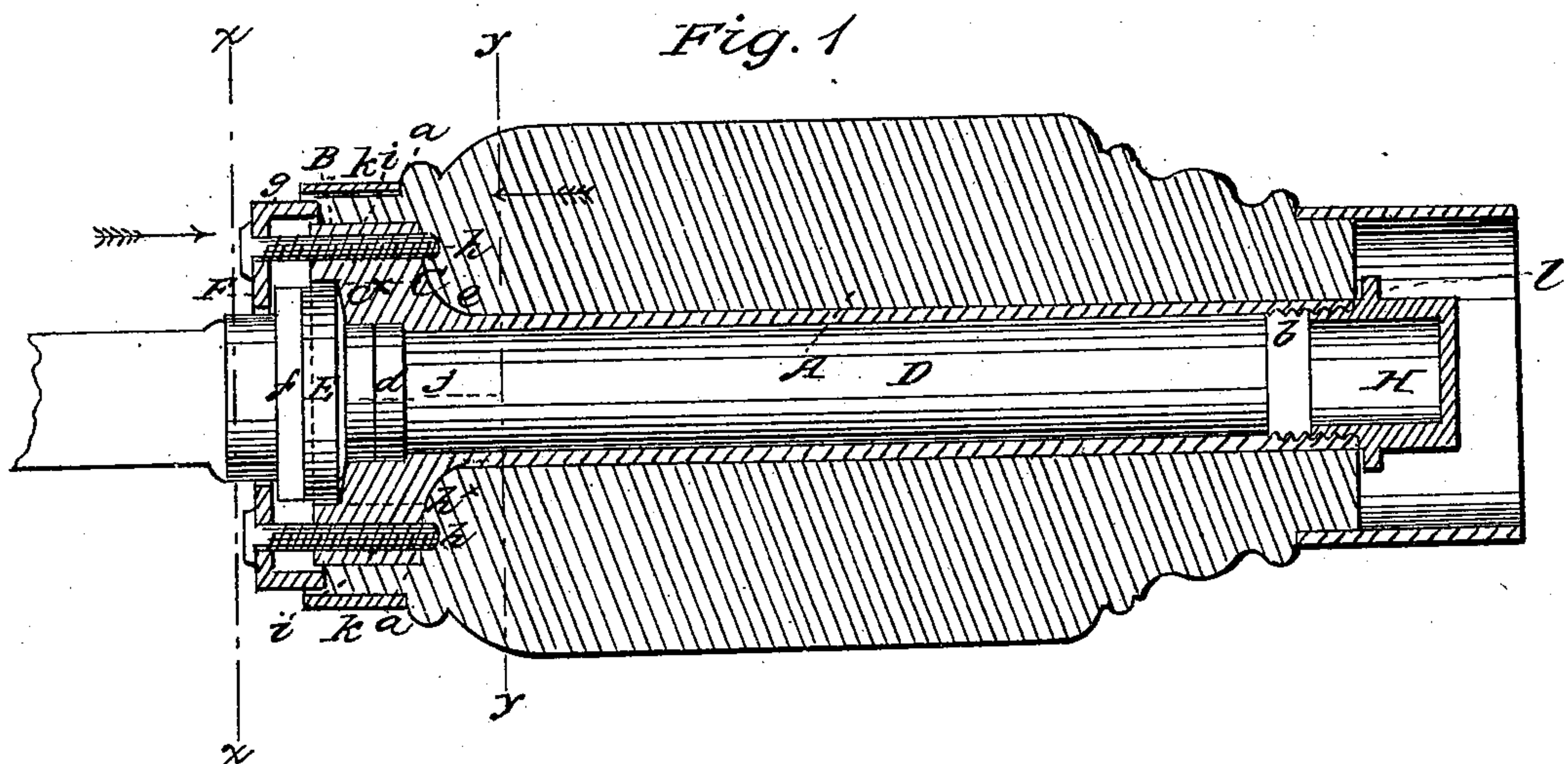


D. DALZELL.
Carriage Axle.

No. 98,473.

Patented Jan. 4, 1870.



Witnesses:
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UNITED STATES PATENT OFFICE.

DAVID DALZELL, OF SOUTH EGREMONT, MASSACHUSETTS.

IMPROVEMENT IN CARRIAGE-AXLES.

Specification forming part of Letters Patent No. 98,473, dated January 4, 1870.

To all whom it may concern:

Be it known that I, DAVID DALZELL, of South Egremont, in the county of Berkshire and State of Massachusetts, have invented a new and Improved Axle for Wheel-Vehicles; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to an improvement on what is generally termed and known as the "English mail axle," and which was first adapted or applied to English mail-coaches. These axles, although an old invention and possessing some disadvantages, are still considered superior on some accounts. They do not admit of the escape of the oil from within the axle-box, and at the same time exclude the dust, thereby preventing the wear of the axle. The disadvantages consist in the removing of three bolts, which run longitudinally through the hub, whenever it is necessary to detach the wheel from the axle. There is also a difficulty attending the application of washers to the axle, and no provision is made for tightening up the hub, to compensate for the wear of the washers. They are not well adapted for light vehicles on account of an insufficient bearing, the axles being shorter than those constructed in the ordinary way.

The object of my invention is to obviate the above-named difficulties, and at the same time retain all the advantages of the English mail axle.

In the accompanying sheet of drawings, Figure 1 is a longitudinal central section of a hub, axle, and box constructed according to my invention; Fig. 2, a transverse section of the same taken in the line $x x$, Fig. 1. Fig. 3 is also a transverse section of the same taken in the line $y y$, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents the axle-box, which may be of cast-iron or other suitable metal, and is cast or formed with a collar, B, at its inner end, the collar having a circular concentric projection, C, at its inner side, which projec-

tion is formed with or permanently attached to the collar, the former, C, being less in diameter than the latter, B, and provided with two ears or lugs, $a a$, at opposite points, which extend outward flush with the periphery of the collar B, as shown more particularly in Fig. 3.

The box A, collar B, and projection C, it will be understood, are all one piece; or, if made or cast separately, any one or more of them are all permanently attached so as to constitute one piece.

The ears or lugs $a a$ of the projection C are drilled longitudinally their whole length, the holes extending through the collar B, and the outer end of the box is drilled a short distance inward, and has an internal screw-thread, b , cut within it, the object of which will be presently stated. The collar B also has two holes, $c c$, drilled through it, for the purpose hereinafter set forth.

D is the arm of the axle, which may be constructed of steel or iron, case-hardened, and of the usual form. It is provided at its inner end with a fixed collar, E, which, when the arm is fitted within the box A, is inclosed in a circular recess, c^x , in the collar B and projection C of the box A, as shown in Fig. 1, washers d being inserted in the recess c^x and bearing against a shoulder, e , at its inner end, and a washer, f , (one or more,) is fitted on the arm D, at the outer side of the collar E.

F represents what is termed the "moon-plate," which is of circular form, and is fitted loosely on the arm D, so that it may turn freely at the inner side of the collar E. This moon-plate is provided with a flange, g , which projects inwardly from it, all around, toward the back of the hub G, said plate having two holes made through it at points to coincide with the holes in collar B and projection C, through which holes screws h pass. By this means the moon-plate and box are connected together, and the arm D retained in the box by the collar E, while the box, hub, and moon-plate are allowed to rotate freely on the arm.

The projection C of the collar B fits within a recess, h^x , in the inner end of the hub G, the ears or lugs $a a$ fitting in notches i in the hub, prepared to receive them, and preventing the hub from turning on the box, said ears or lugs also serving to give a long bearing for the screws h .

The holes *c c* in the collar B are designed to admit of screws *j* passing into the inner end of the hub, to secure said collar to the hub, and prevent the slipping of the latter off from the arm in the event of the box breaking transversely—a contingency of not very common occurrence, but still sometimes occurring.

The flange *g* of the moon-plate fits within the inner hub-band, *k*, but sufficient space is allowed to admit of the movement of the flange within the band and the screwing up of the moon-plate, from time to time, to compensate for the wear of the washers, and cause the vehicle to run easily and noiselessly.

H represents a nut, which is hollow and screws into the outer end of the box A, into the internal-thread *b*. This hollow nut serves as an oil-chamber, and supplies the arm and box with oil, or any proper lubricating substance, which passes into a longitudinal groove made in the exterior of the arm, and extending the whole length of the same. The nut H is provided with a flange, *l*, which abuts against the outer end of the hub. The object in having said nut screw into the box A is to admit of a small nut being used, so as to give a light appearance, which is necessary in light vehicles. If the nut was made to screw on the exterior of the box, it would be, of course, proportionably larger, and have a heavy, cumbersome look when applied to light vehicles.

From the above description it will be seen that I obtain a long arm and a good bearing-surface for the hubs. The arm may be kept perfectly lubricated at all times, the hub kept snugly on the arm without any unnecessary play, and without the necessity of removing the hub from the arm, in order to tighten it up. In short, I retain all the advantages of the old English mail axle, and overcome all the disadvantages attending it as originally constructed.

I do not claim, broadly, the dispensing with long bolts extending entirely through the hub, for short bolts have been previously applied, but in a different way from mine, and they have not been generally adopted; but

I do claim as new and desire to secure by Letters Patent—

The construction and arrangement of the flanged cap or moon-plate F, the collar B, projection C, and lugs *a a* on the box A, and the collar E and washers *d f* on the arm D, when the moon-plate is secured to the collar B C *a* of the box A by screws *h h*, and the said box is made fast to the hub by screws *j j*, and is provided with the hollow nut H, screwed into one end, all as herein described.

DAVID DALZELL.

Witnesses:

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