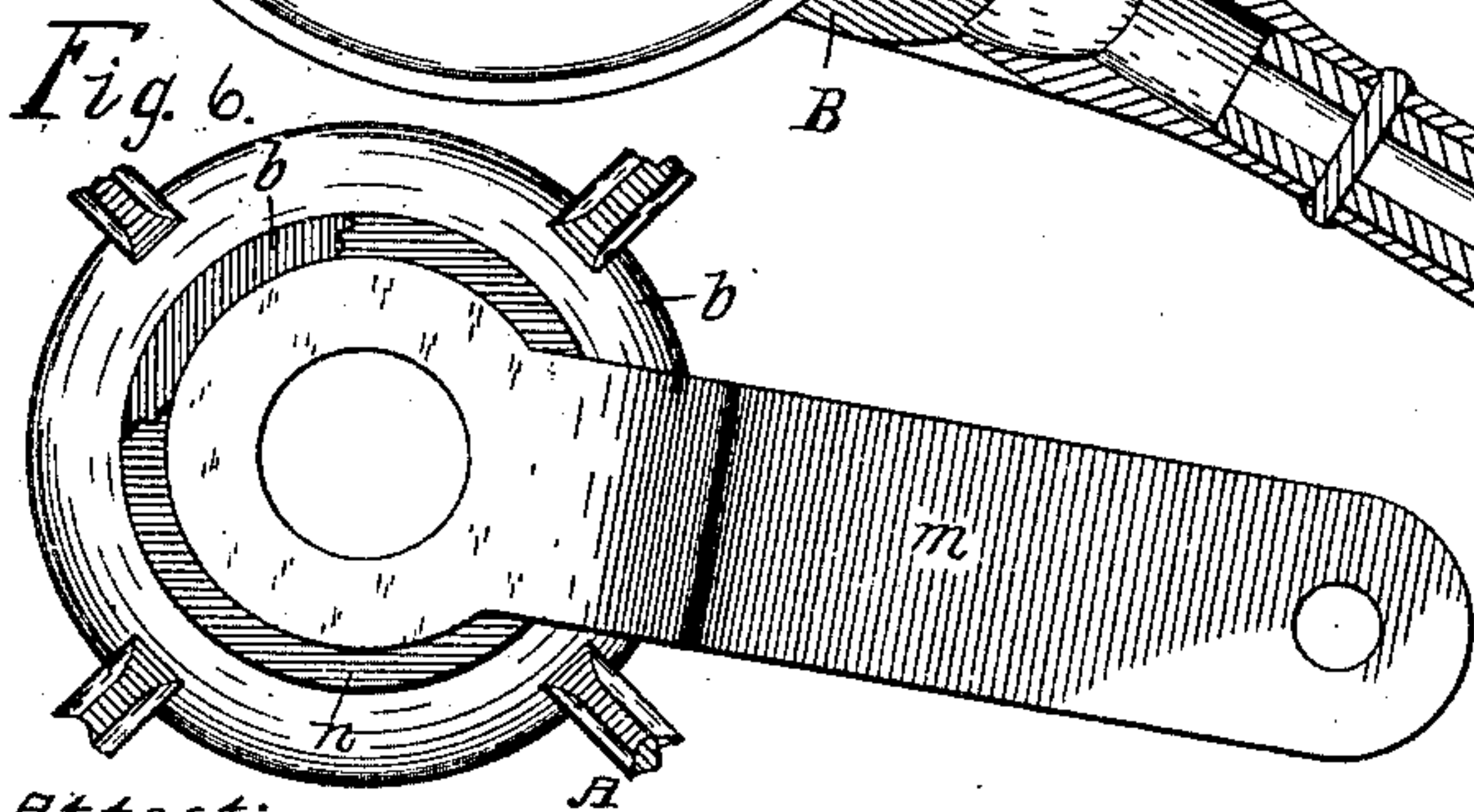
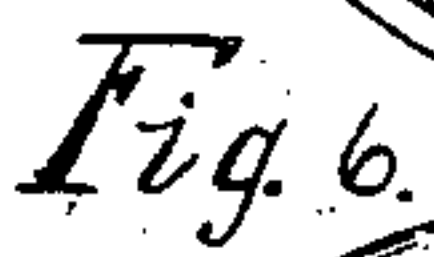
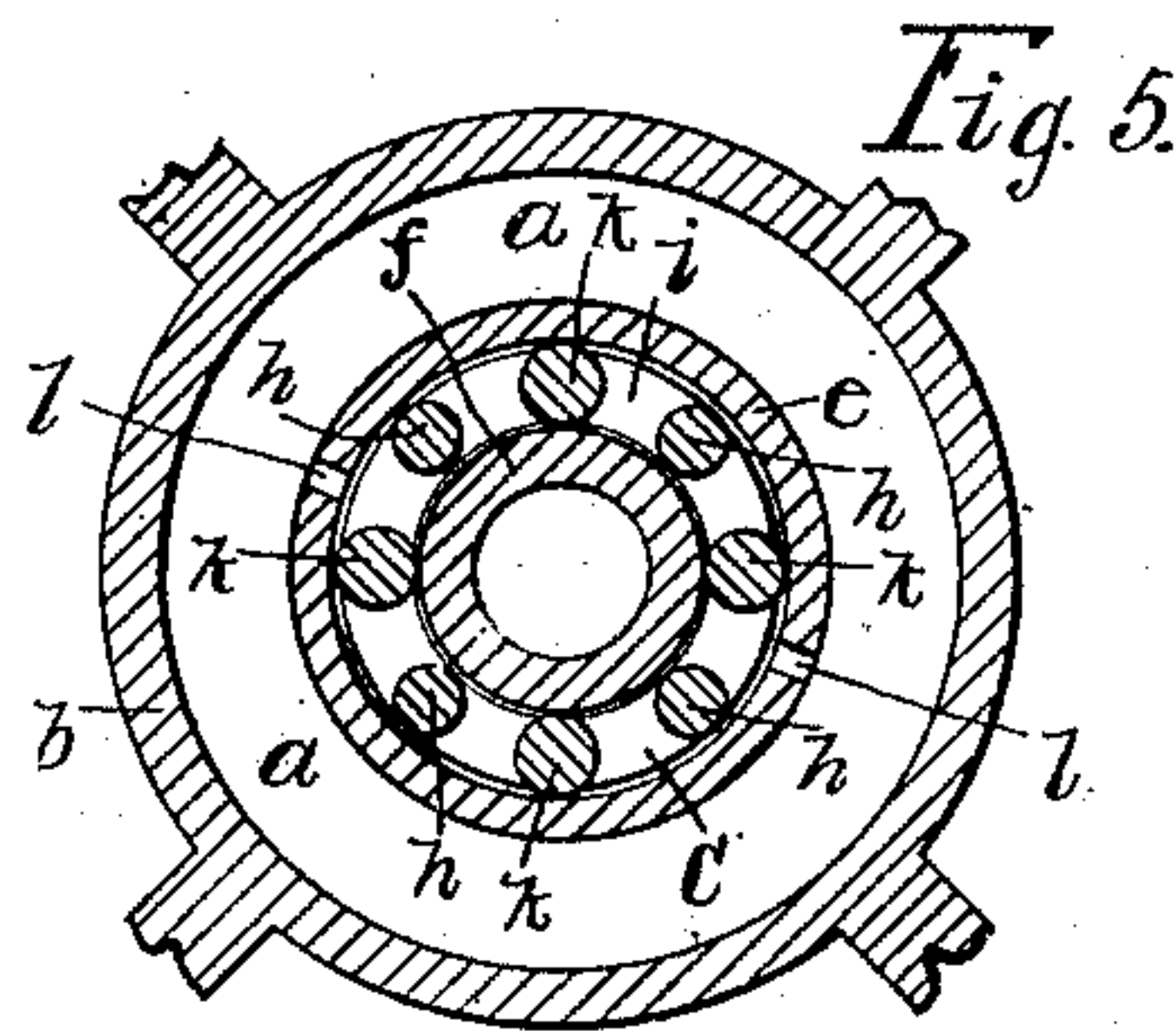
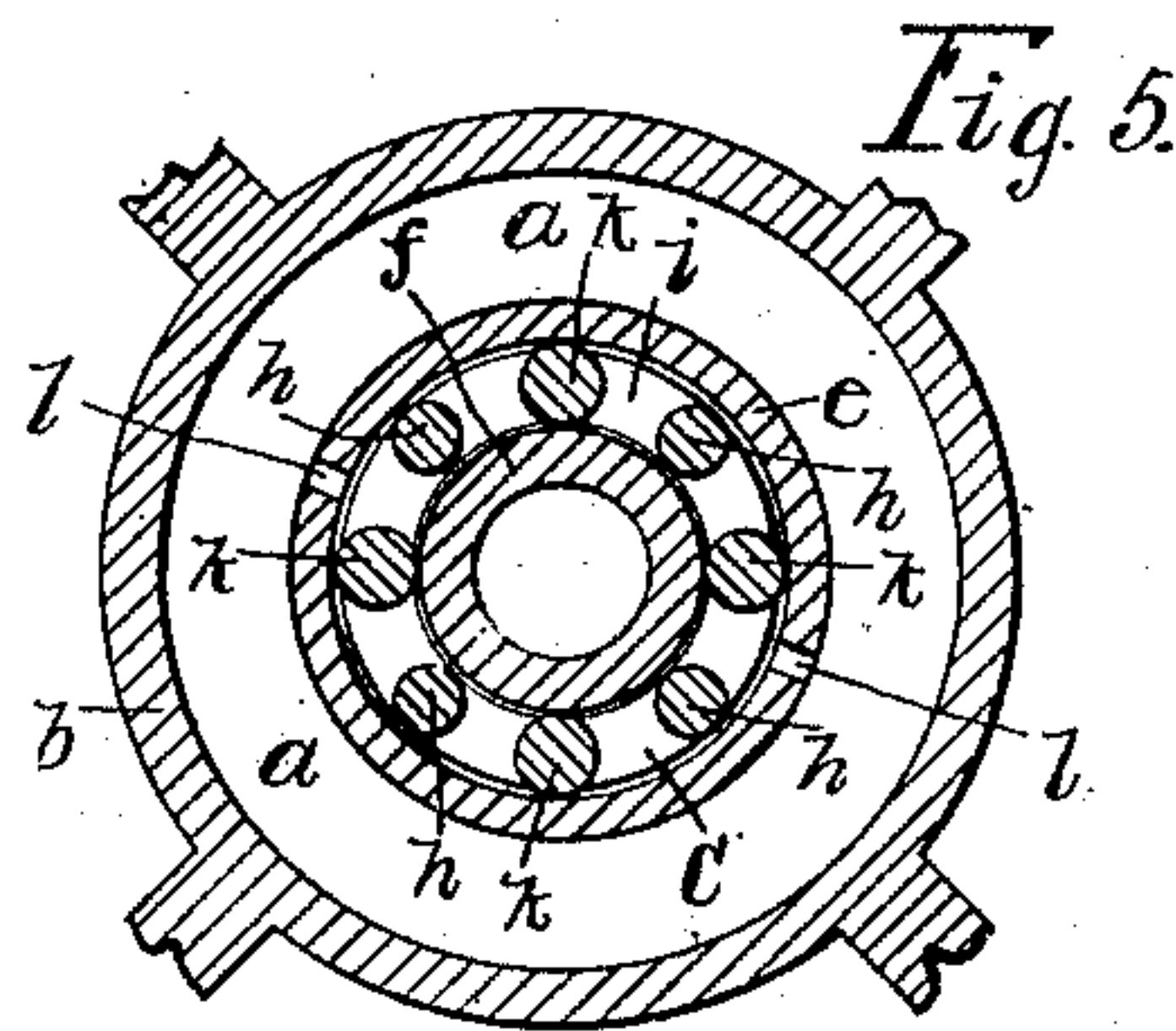
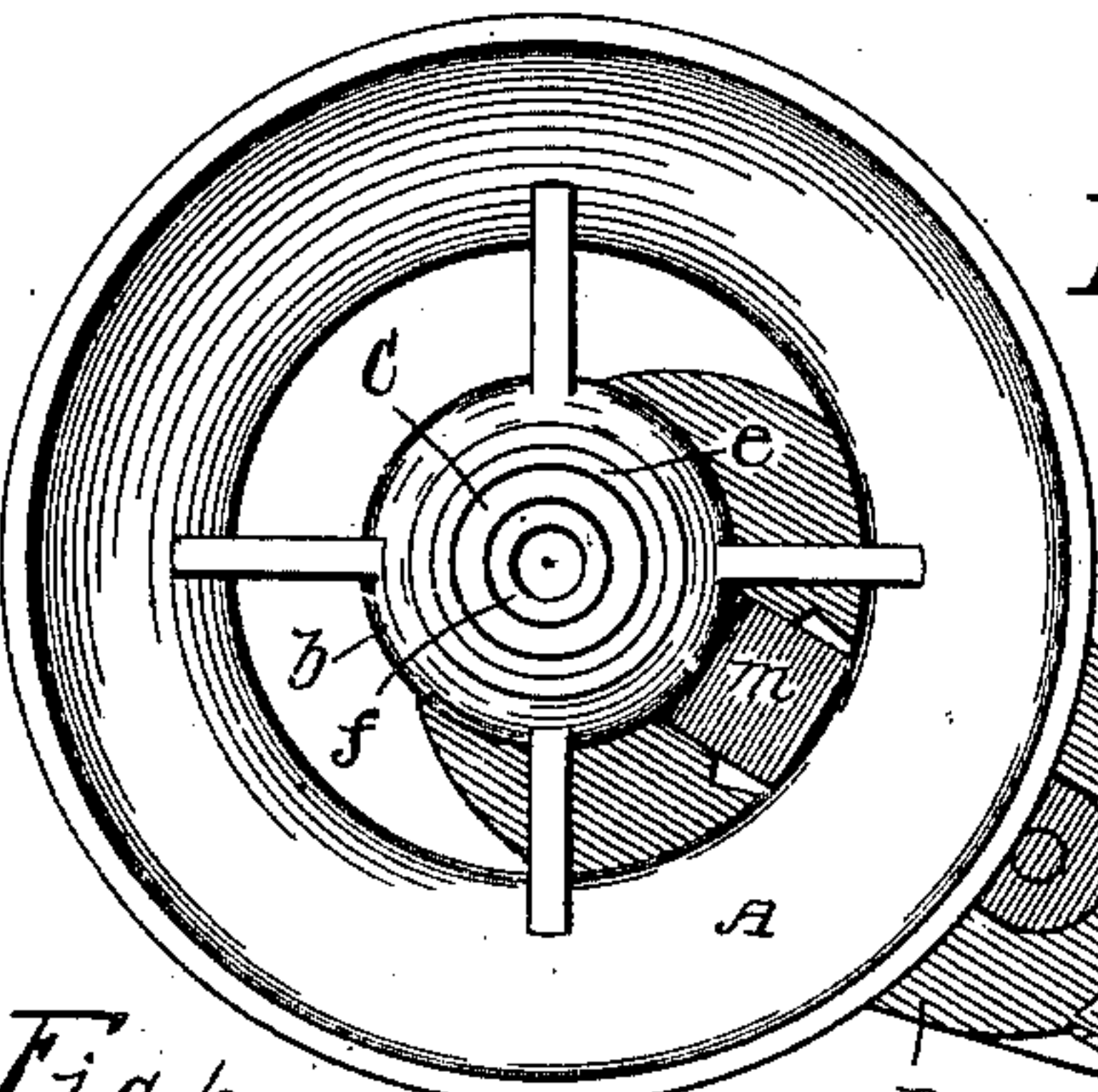
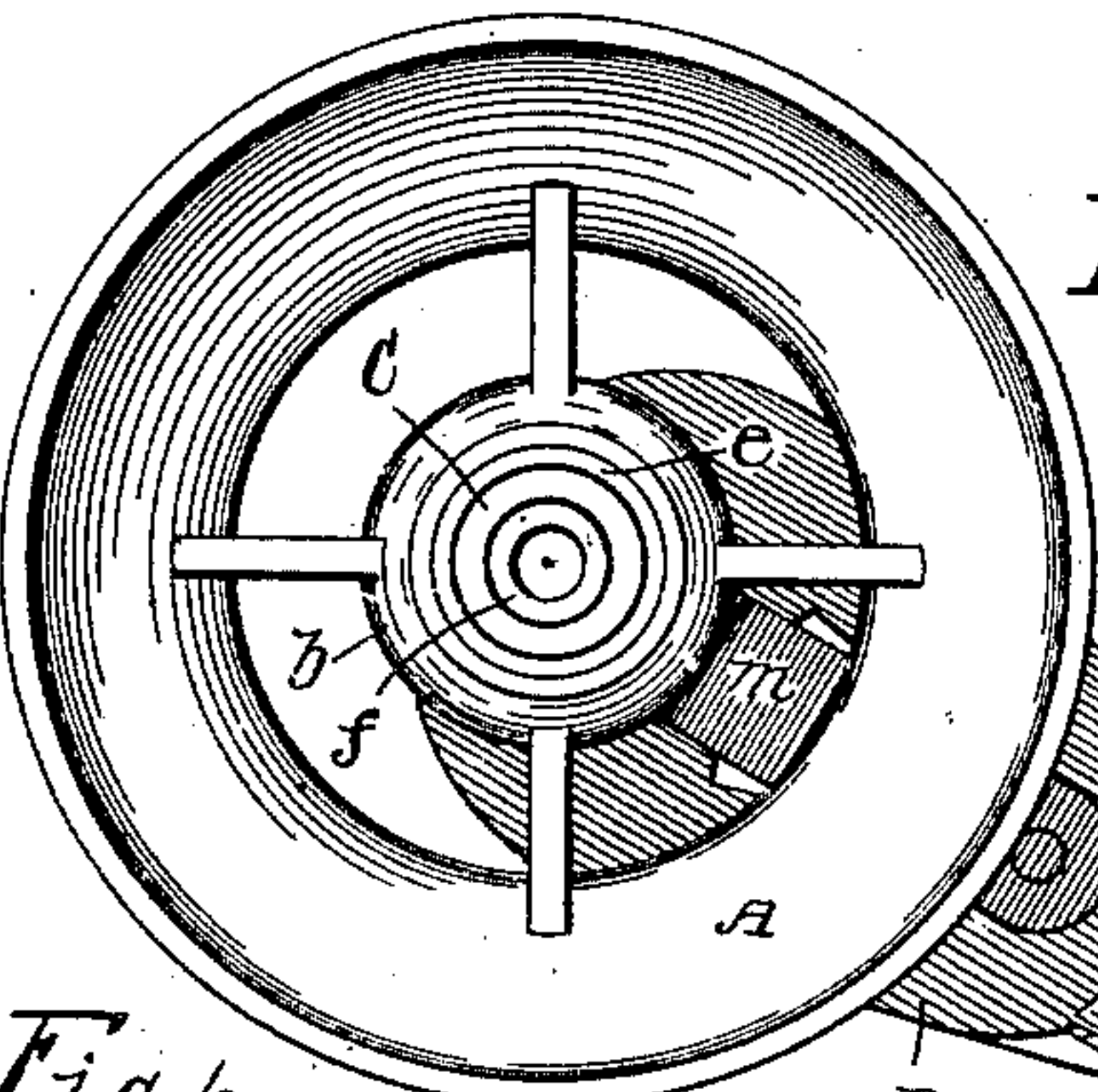
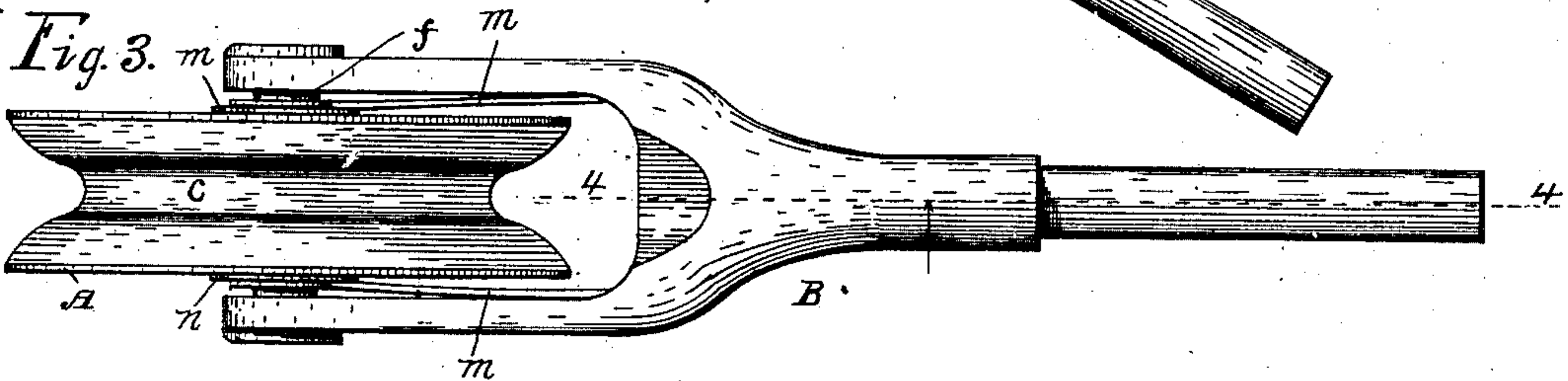
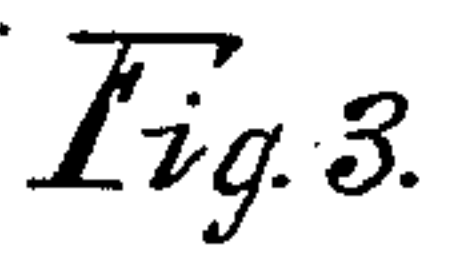
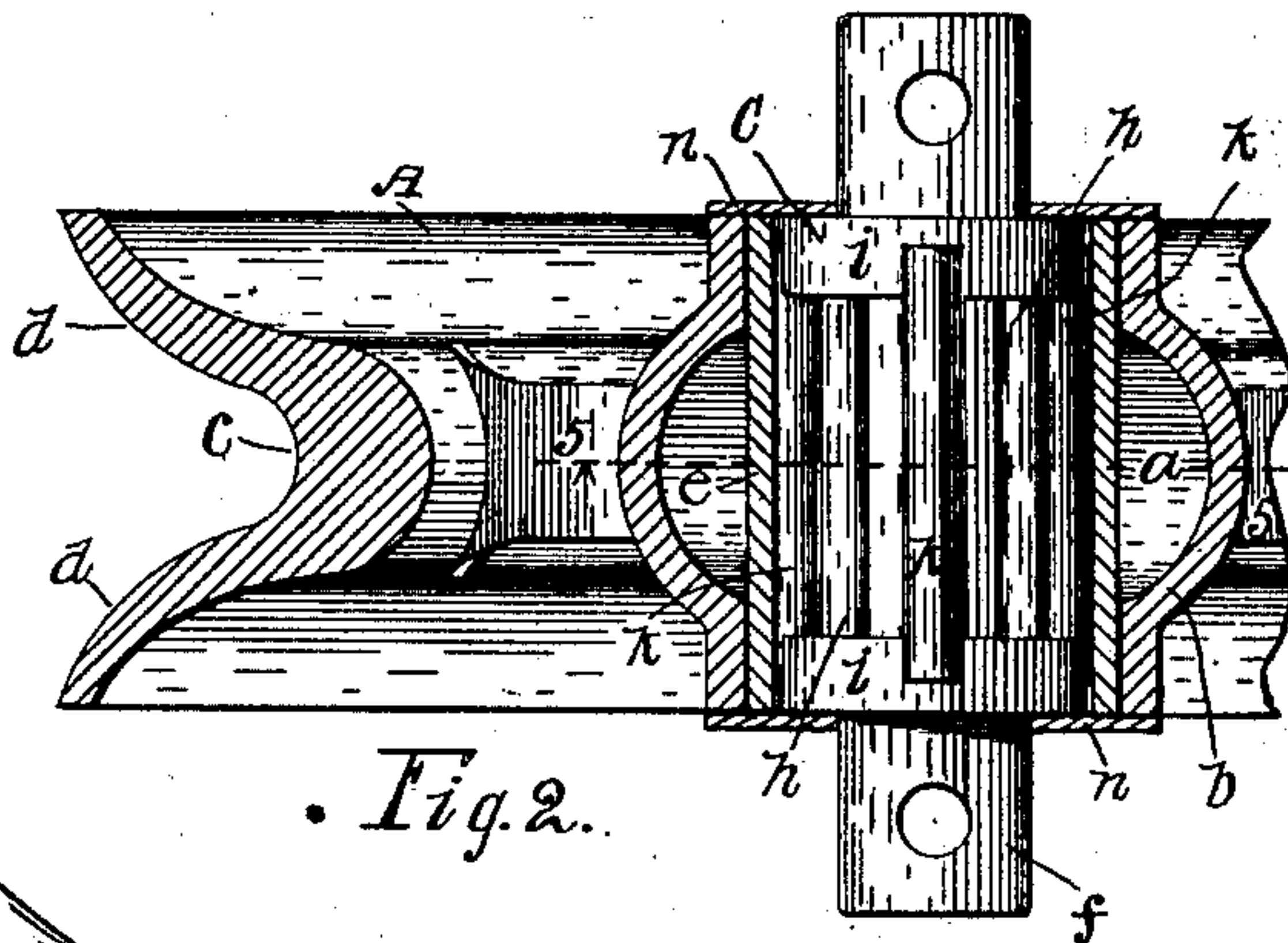
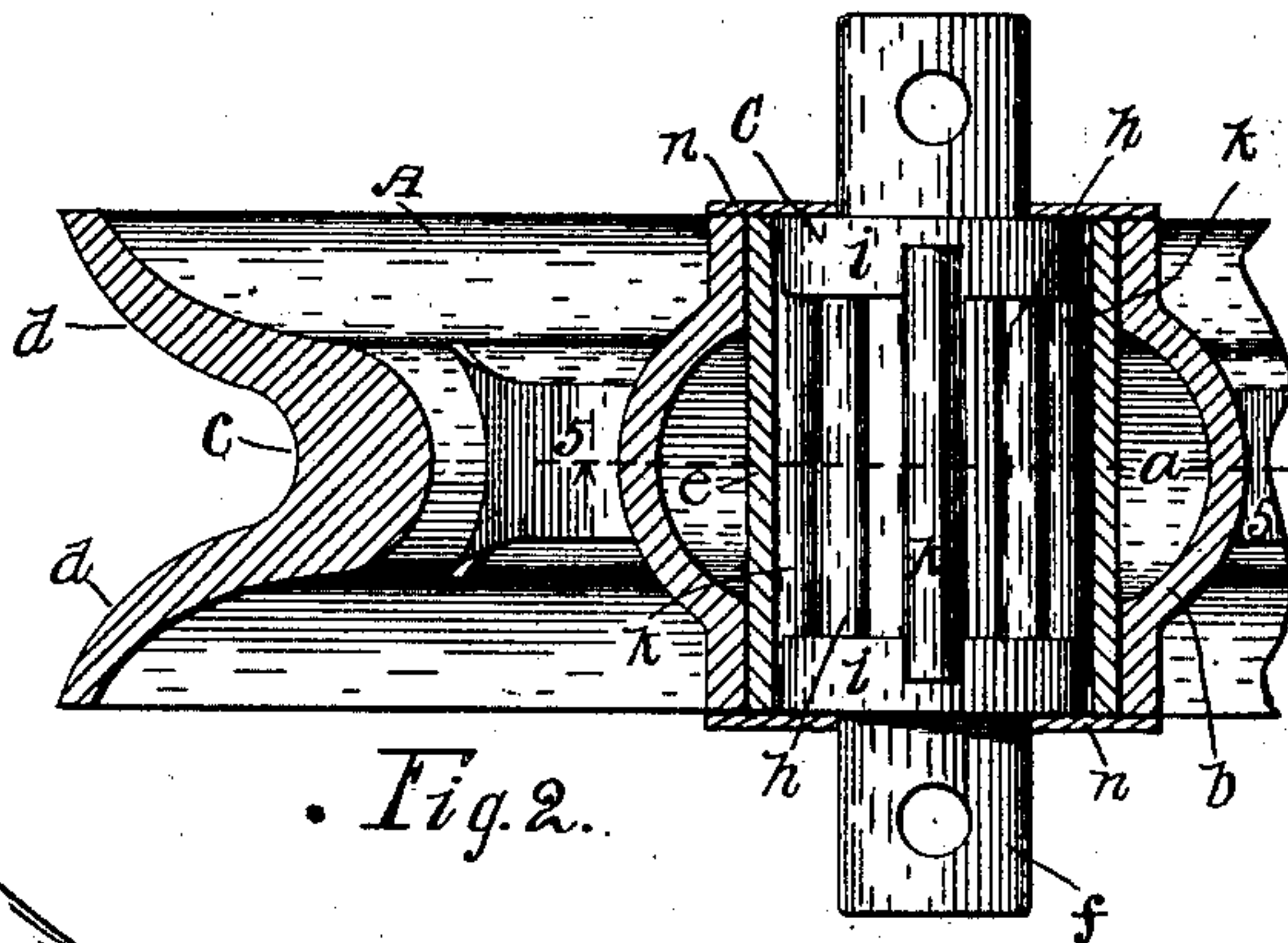
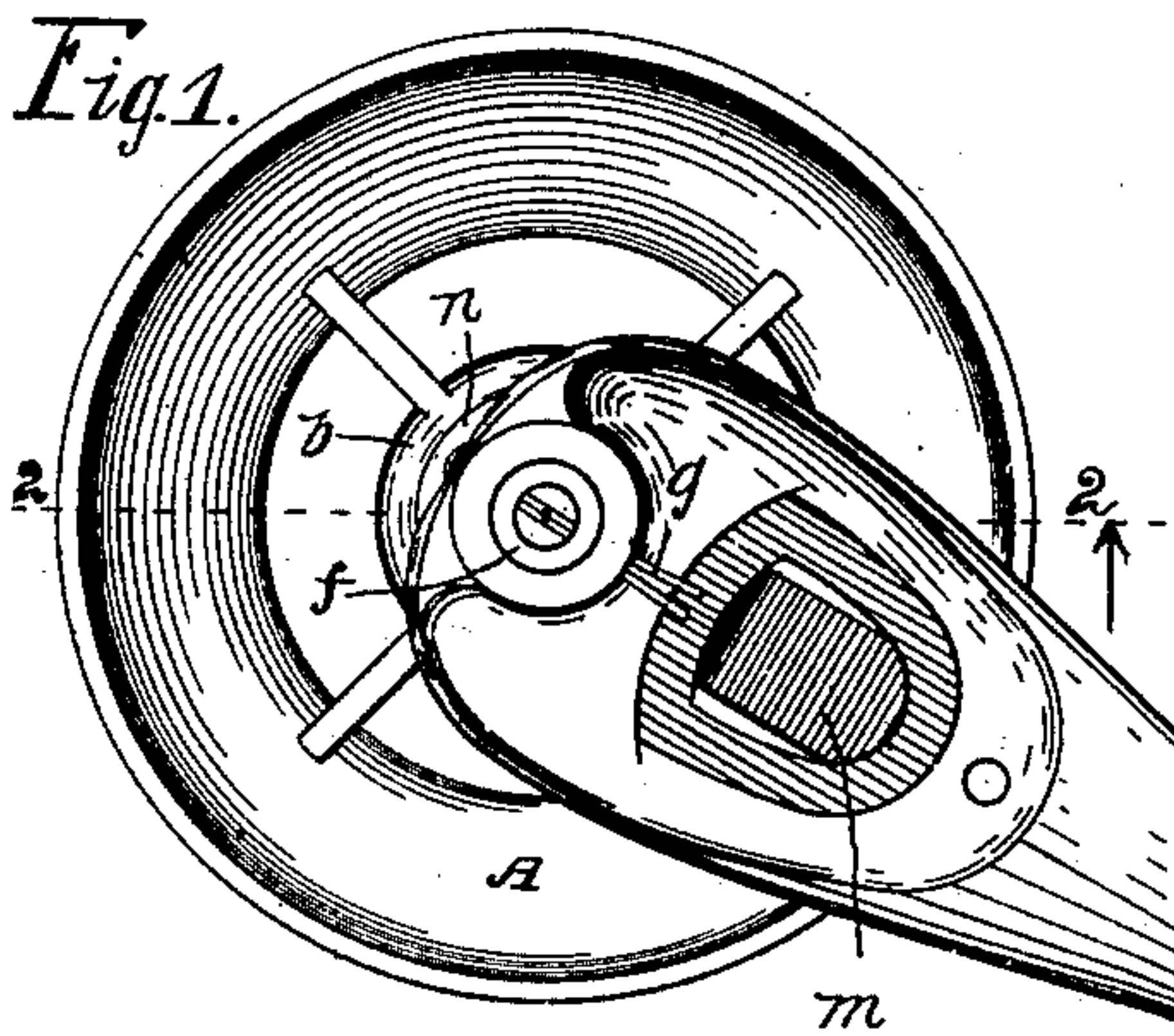


**No. 729,082.**

PATENTED MAY 26, 1903.

**F. D. MOON.**  
**TROLLEY WHEEL AND HOLDER.**  
**APPLICATION FILED AUG. 1, 1902.**

**NO MODEL**



Attest:  
W.B. Smith.  
M.D. Phillips.

Inventor:  
Frank D. Moon.  
By E. B. Whitmore, Atty.



# UNITED STATES PATENT OFFICE.

FRANK D. MOON, OF LOCKPORT, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO NATIONAL TROLLEY MANUFACTURING COMPANY, A CORPORATION OF NEW YORK.

## TROLLEY-WHEEL AND HOLDER.

SPECIFICATION forming part of Letters Patent No. 729,082, dated May 26, 1903.

Application filed August 1, 1902. Serial No. 118,009. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK D. MOON, of Lockport, in the county of Niagara and State of New York, have invented a new and useful Improvement in Trolley-Wheels and Holders, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

My invention is a trolley-wheel and holder therefor, the same being hereinafter fully described, and more particularly pointed out in the claim.

One object of the invention is to produce a trolley-wheel having the groove in its contact-face formed with convex sides to more easily traverse the current-wire at the angles of the curves and at switches.

Another object of the invention is to construct the device so the wheel may be lubricated at its axial bearing without obstructing the flow of the electric current.

Other objects and advantages of the invention will be brought out and made to appear in the following specification, reference being had to the accompanying drawings, forming a part thereof, the invention being fully described, and more particularly pointed out in the claims.

Figure 1 is a side elevation of my improved trolley-wheel and holder as in action. Fig. 2 is a diametrical section of a part of the wheel and other parts, taken on the dotted line 2 2 in Fig. 1, parts being omitted. Fig. 3 is a plan of the device seen as indicated by arrow 3 in Fig. 1. Fig. 4 is a central longitudinal section of the bifurcated holder for the wheel, taken on the dotted line 4 4 in Fig. 3. Fig. 5 is a central transverse section of the hub of the wheel and the roller-bearing, taken on the dotted line 5 5 in Fig. 2. Fig. 6 is a side elevation of a controlling-spring and adjacent part of the hub of the wheel and the conducting-washer viewed as in Fig. 1, parts being broken away.

In the drawings, A is the trolley-wheel, and B the bifurcated holder therefor, formed to connect with the trolley-pole. The wheel A is of novel construction, it being large in diameter for easy rolling and formed with a hollow hub *b*, the cavity *a*, Fig. 2, within

which serving as a font or reservoir for holding oil for lubricating the axial bearing. The wheel is further formed at its hollow periphery or contact-face so that a diametrical section, Fig. 2, will show two reverse curves—that is to say, the wheel is formed with a concave surface *c* between two equal convex surfaces *d d*, the three together constituting a continuous easy curve from side to side of the wheel. This double-reverse curve or ogee form of the contact-face of the wheel insures at all times an easy bearing for the current-wire against the wheel. Particularly is this the case and of great advantage when the wheel is passing curves—that is to say, abrupt bends or angles between the straight tangential sections of the current-wire over curves in the track. In such cases when the planes of the wheel and the wire are not parallel the wire crossing the grooved face of the wheel obliquely if the groove in the wheel be either V shape or concave throughout the slanting wire will draw or bear harshly against the edges or corners of the wheel, causing the latter to jerk and jump, and sometimes leave the wire. These objections are overcome and avoided by giving to the sides of the groove convex forms, as shown, besides insuring a continuous and perfect electrical contact between the wire and the wheel.

To complete the annular oil-cavity *a* in the hub of the wheel or make the inclosure perfect, a cylinder of metal or thimble *e* is inserted in the hub with a close and snug fit, as shown in Figs. 2 and 5. The wheel turns around an axial shaft *f*, held motionless in the branches of the holder B by some simple means, as transverse split keys *g g*, Figs. 1 and 3. The device is constructed to have the wheel turn light on a roller-bearing, a roller-frame C, Figs. 2 and 5, with antifric-tion-rollers *k*, being inserted in the thimble *e* around the shaft *f*. This roller-frame is formed with two equal parallel rings or annular heads *i i*, connected by longitudinal parallel rods *h*, equally spaced, the whole constituting a rigid frame or structure, holding the series of equal antifric-tion-rollers *k* parallel and between the rods *h*. These rollers are held to turn freely in bearings in



the heads *i i*, being of such diameter as to project laterally beyond the heads to bear on their outersurfaces against the inner surface of the thimble *e* and at their inner surfaces against the shaft *f*, thus constituting a roller-bearing for the wheel upon its axial shaft *f*, and it will be noted that if the bearings at the ends of the rollers *k* in time materially wear or become reduced a serviceable roller-bearing for the wheel will yet continue so long as the diameters of the rollers between the end bearings cause them to project within and without the concave and the convex surfaces of the annular heads *i i*, as stated. Small openings *l*, Fig. 5, are formed through the sides of the thimble *e* to permit of the flow of oil from the reservoir *a* onto the rollers *k*.

In constructing this device I employ plate-springs *m m*, Figs. 1, 3, and 4, rigid with the inner opposing faces of the fork or holder B, pierced at their free ends by the shaft *f*. These springs stand or incline normally inward or toward each other at their free ends in positions tending to press the opposite ends of the roller-frame C, washers *n n* being inserted between the springs and the frame. The wheel and the roller-frame are movable laterally along the shaft *f* between the branches of the holder B, and the springs tend to hold them centrally between the branches, said springs also constituting additional means for conducting the electric current from the wheel to the adjacent parts of the holder B. The washers *n* are purposely made larger in diameter, as shown in Figs. 2 and 6, so as to bear against the ends

of the thimble *e* and the hub *b* beyond or outside of the roller-frame to permit the divided currents to pass from the hub of the wheel through them and the springs to the shaft and the holder B. These washers thus furnish conductors for the currents onward toward the motor without the currents having to be transmitted through the oiled bearing-surfaces of the rollers and the axial shaft *f*. This device being thus constructed admits of the wheel turning easily on lubricated roller-bearings, allowing it to run long without wearing out, and at the same time provides for a free transmittal of the current between the wire and the trolley-arm.

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

The herein-described trolley device comprising a wheel, a forked holder therefor, springs rigid with the inner opposing faces of the holder with their free ends receiving the shaft of the wheel and inclined inwardly, said wheel being movable laterally along its shaft between the branches of the holder, a roller-frame, washers on said shaft upon opposite sides of the wheel and bearing against opposite ends of the hub of said wheel outside the roller-frame, said springs and washers constituting conductors for the electric current.

In witness whereof I have hereunto set my hand, this 28th day of July, 1902, in the presence of two subscribing witnesses.

FRANK D. MOON.

Witnesses:

ENOS B. WHITMORE,  
MINNIE SMITH.