

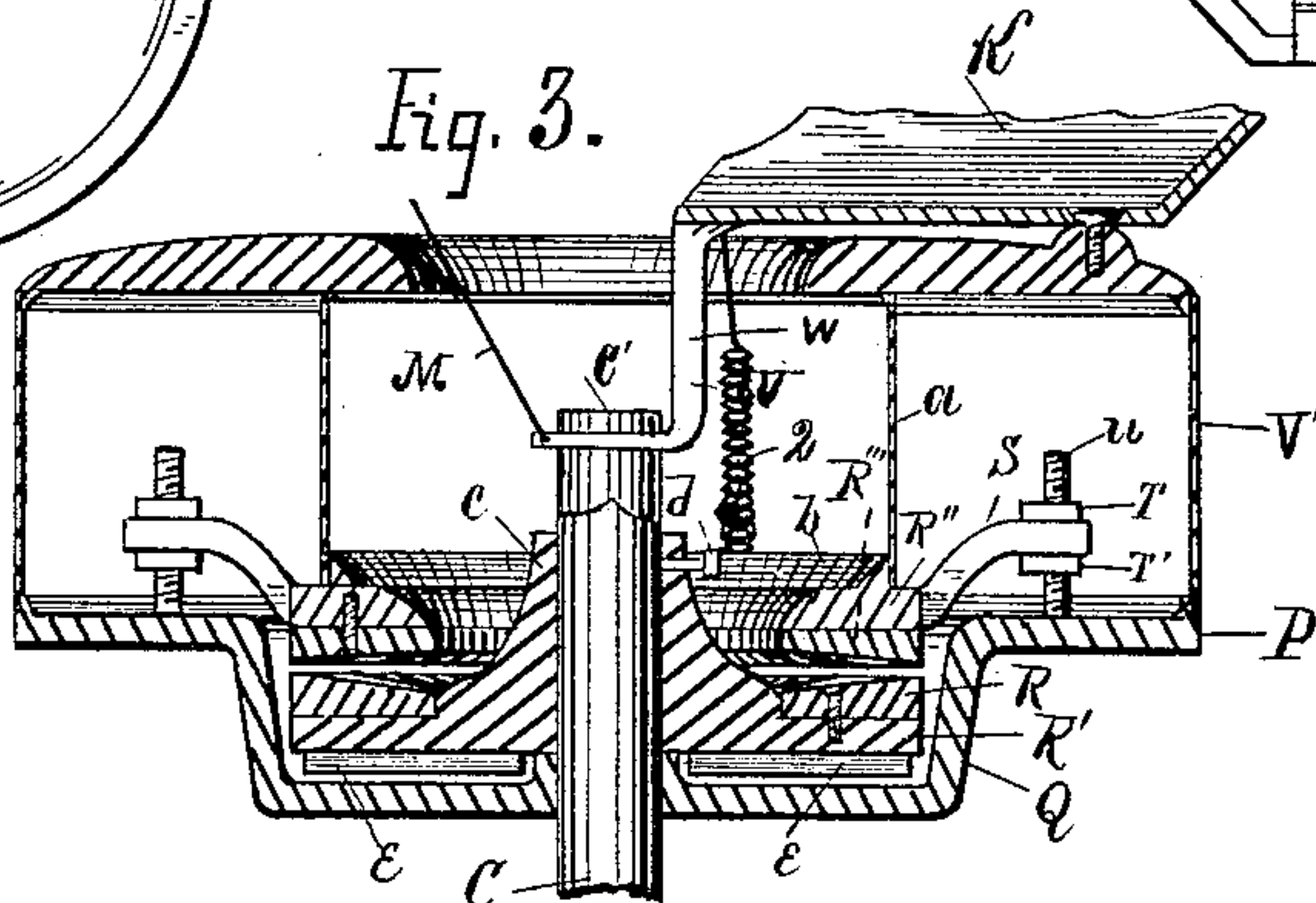
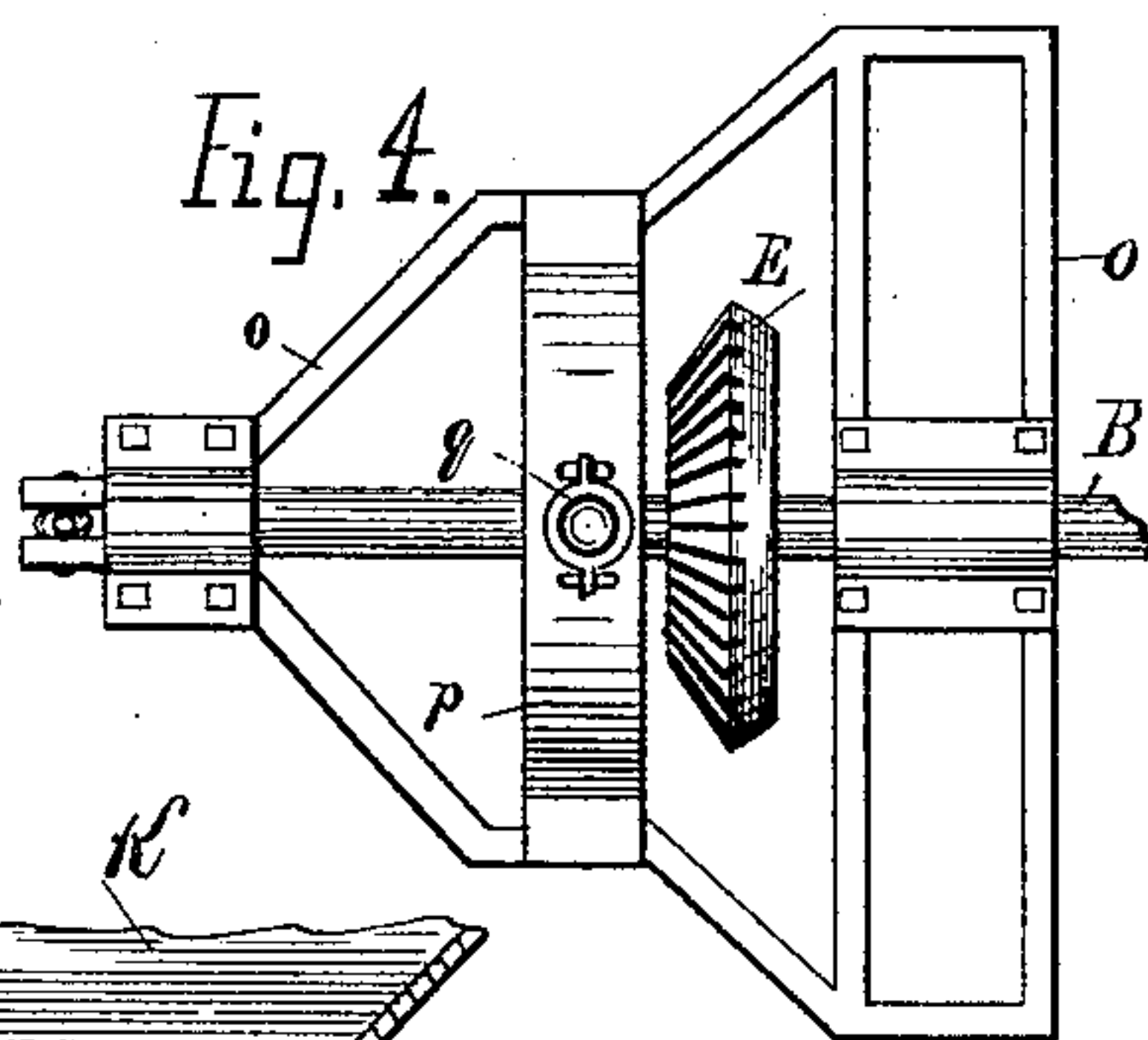
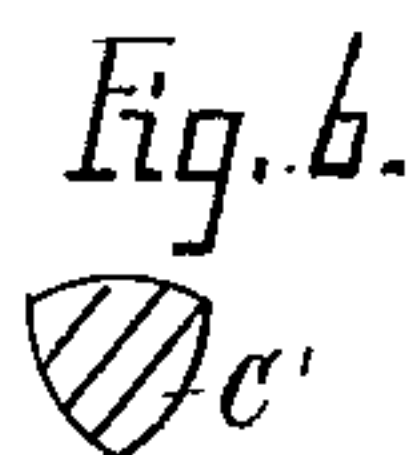
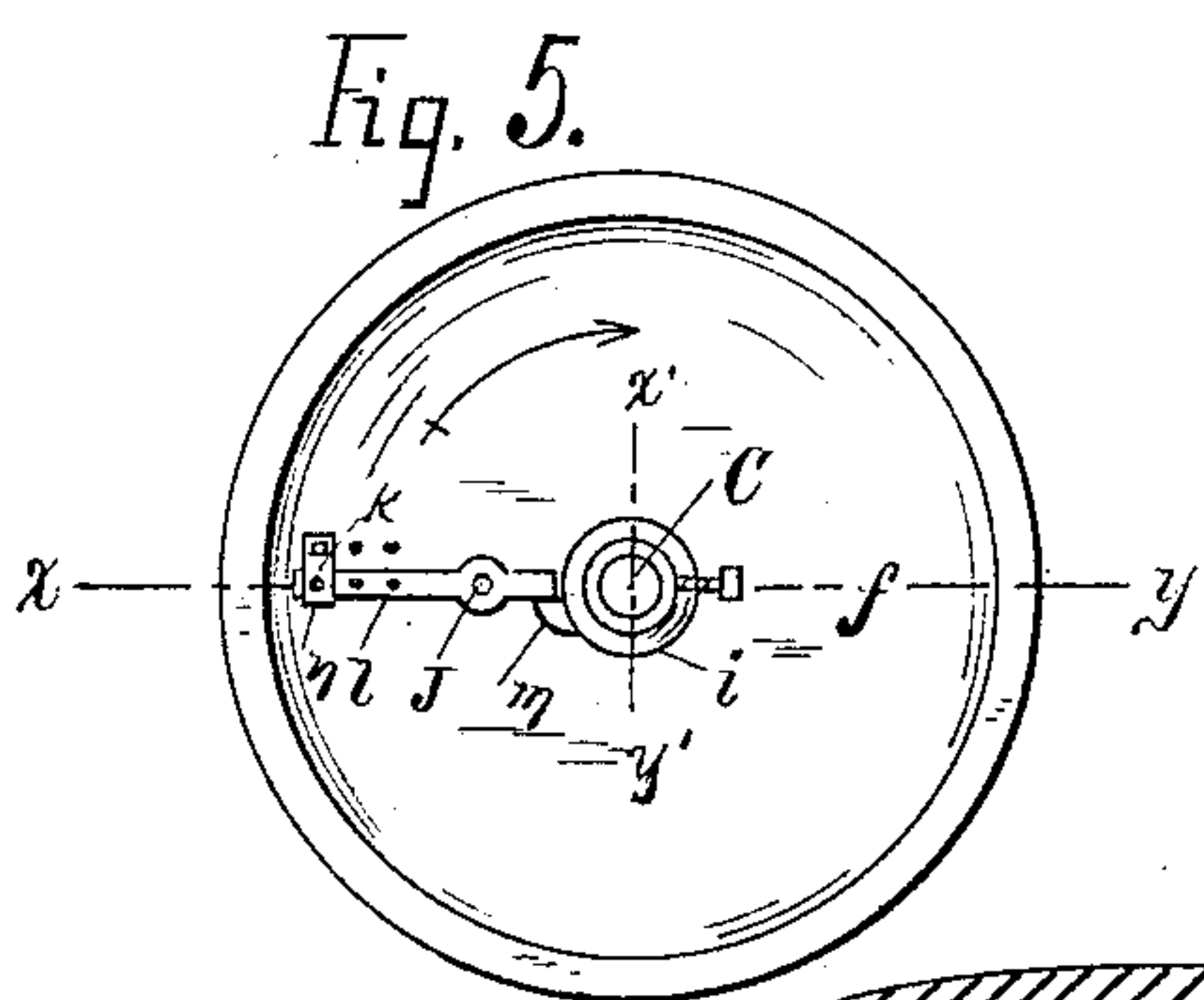
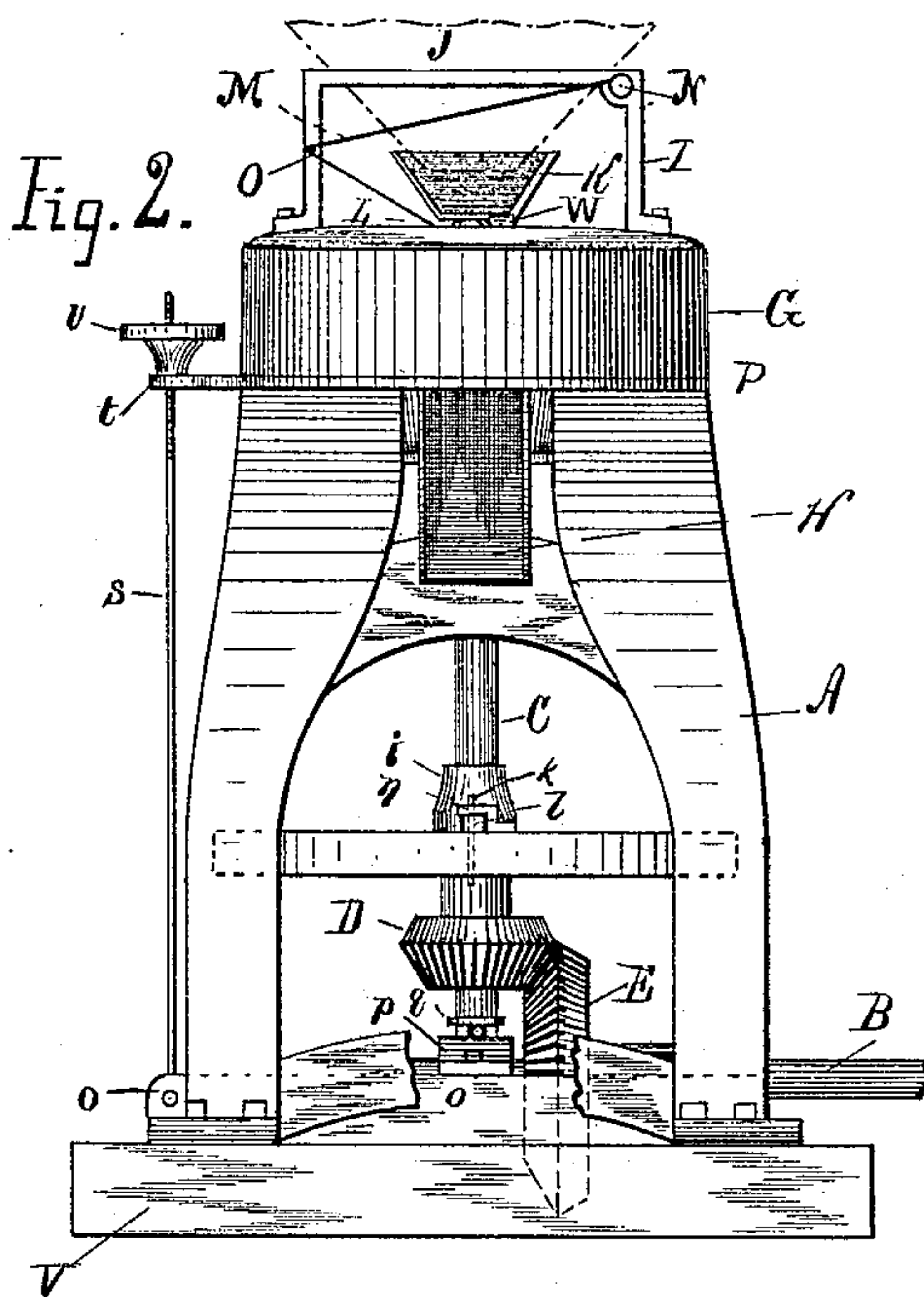
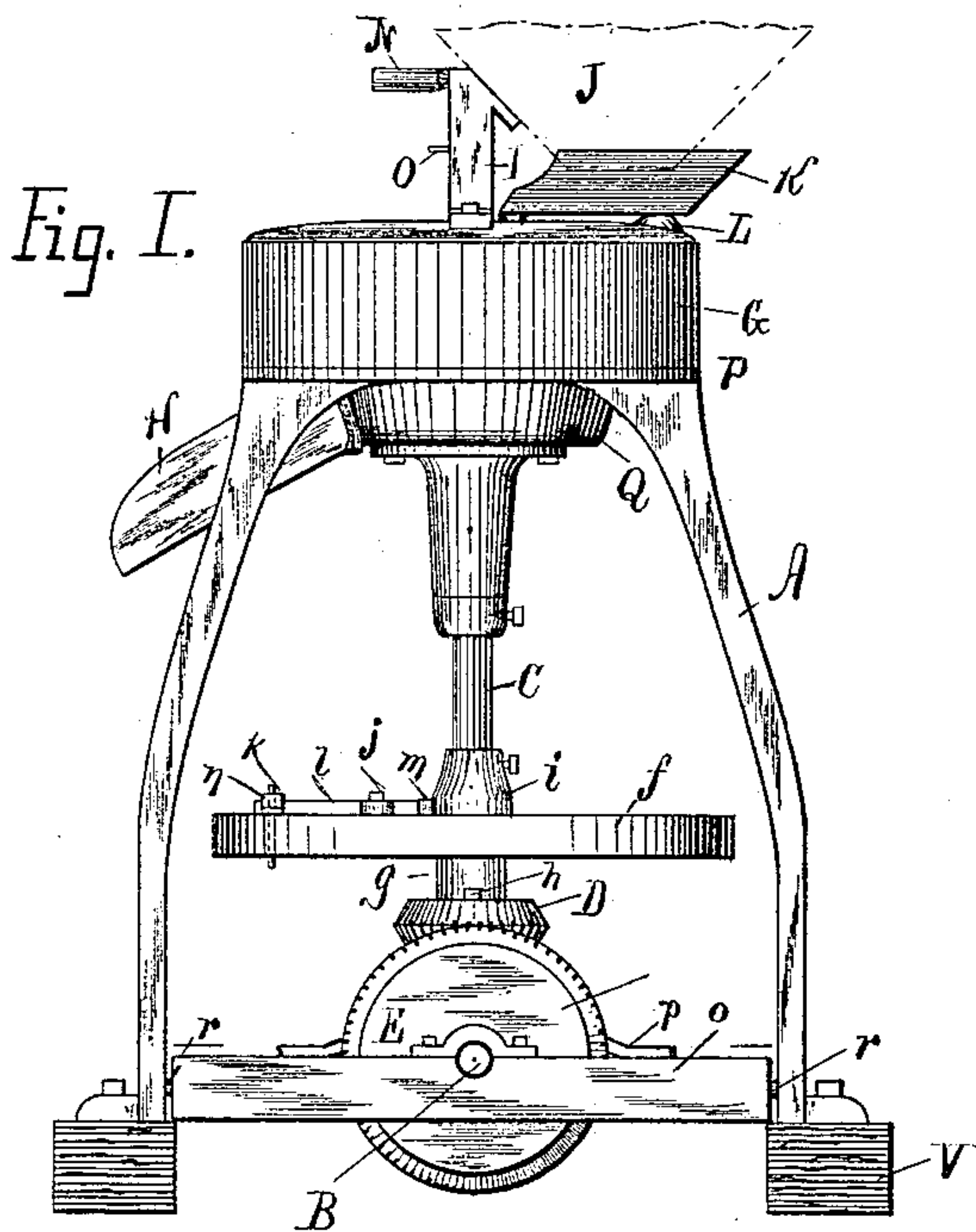
(No Model.)

2 Sheets—Sheet 1.

G. H. McCULLOCH.
GRINDING MILL.

No. 379,900.

Patented Mar. 20, 1888.



Witnesses.
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 7.

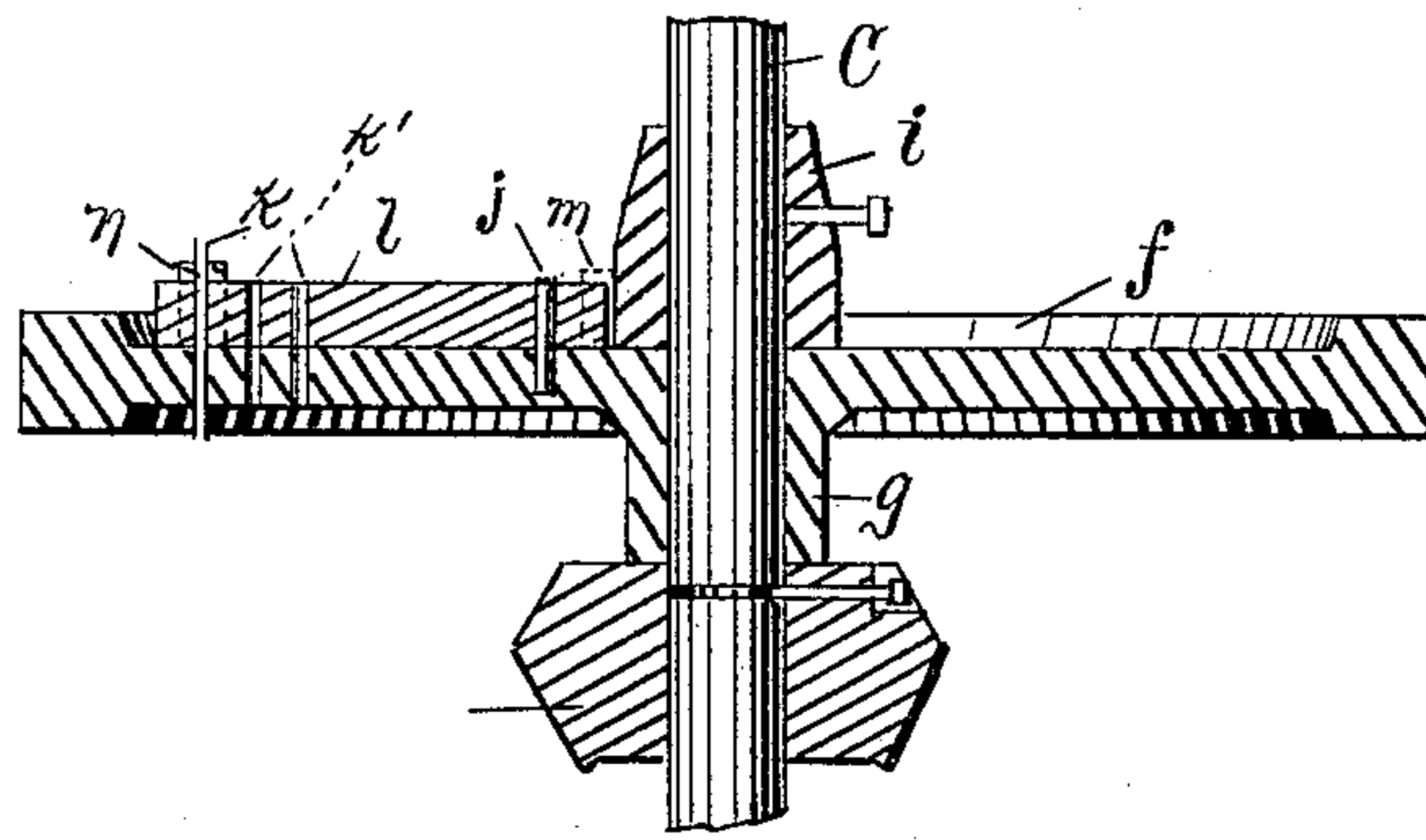
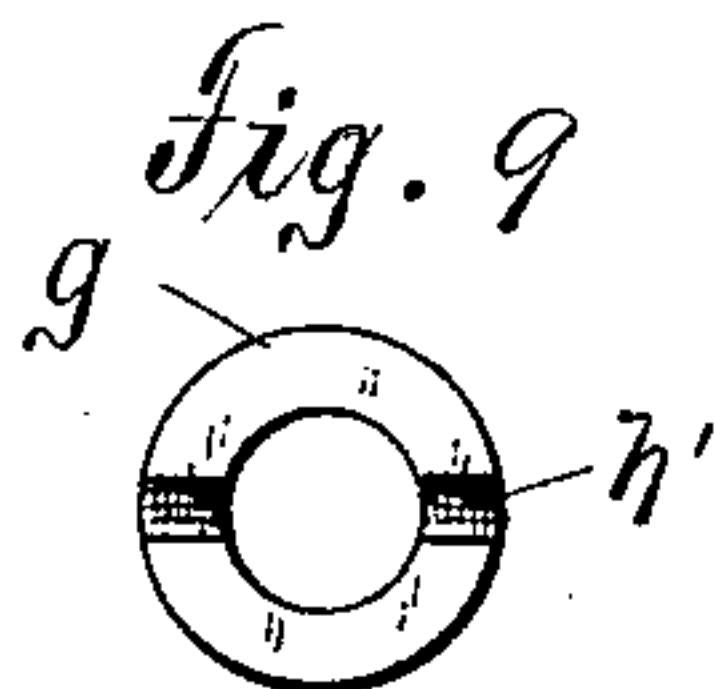
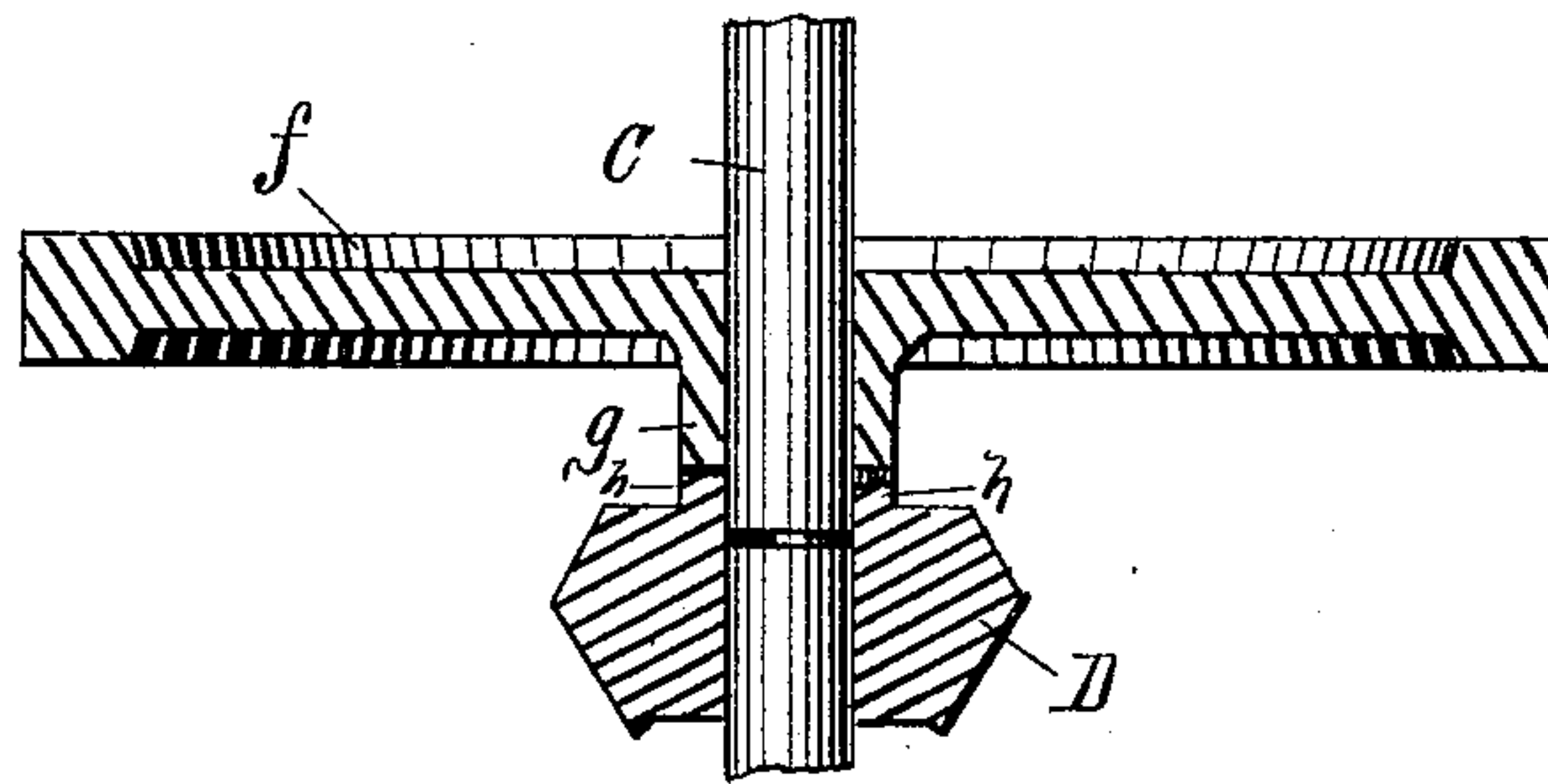


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE H. McCULLOCH, OF LENA, ILLINOIS, ASSIGNOR OF ONE-HALF TO
JOHN McCULLOCH, OF SAME PLACE.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 379,900, dated March 20, 1888.

Application filed May 28, 1887. Serial No. 239,629. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. McCULLOCH, a resident of Lena, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Grinding-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention is in mills of the class usually made of iron and driven by power independent of the mill. It is fully illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of the mill. Fig. 2 is a front elevation with the adjusting mechanism partly broken away. Fig. 3 is a central vertical section through the axis of the mill, showing the burrs and adjacent parts. Fig. 4 is a plan of a portion of the adjusting mechanism. Fig. 5 is a plan of the balance-wheel and certain connected parts. Fig. 6 is a section of the top of the burr-shaft. Fig. 7 is a section on the line xy , Fig. 5. Fig. 8 is a section on the line $x'y'$, Fig. 5. Fig. 9 is a view of the lower end of the hub g , seen in the line of the shaft C.

In all the figures like letters refer to the same parts.

A is an upright frame, in which is mounted a driving-shaft, B, and also a central vertical shaft, C, connected therewith by bevel-gears D E. Upon the upper part of the shaft C is rigidly secured the lower horizontal grinding-burr, while the upper burr is rigidly mounted upon the frame A. Grain is fed into the mill from a hopper supported by the frame A and the immovable parts attached thereto, and means are provided whereby the rapidity of delivery may be regulated and uniformity be secured. The burrs are inclosed in a case or box, G, from which the ground grain passes by a spout, H. Upon the top of the case is bolted an arch, I, to which the hopper J is firmly fixed in such position that its apex is at one side of the mill's axis and a little above the case G. A shallow trough, K, pivoted upon a hub, L, upon the case, receives the grain from the hopper and delivers it to the burrs. A finger, W, projecting from the front

end of the trough downward and outward, Fig. 3, lies alongside the upper end of the shaft C, and is held in contact therewith by a spring, 2, attached to the finger at one end and at the other to the upper burr-plate, which is stationary. The upper end of the shaft is of the form shown in cross-section in Fig. 6, and while the finger is kept in contact with its surface by the spring its rotation must cause oscillation of the trough. A cord, M, also attached to the finger and wound upon a handle, N, inserted in a friction-bearing in the arch I, serves for adjusting the inclination of the trough K, and consequently regulates the discharge of the grain from the trough.

A plate, P, is rigidly attached to the frame A and provided with a central depression, Q, which forms a receptacle for the burrs. The burrs R R' are fastened, respectively, to burr-plates R' R'' by means of screws. The lower burr-plate is provided with a central hub, c , and a set-screw, d , by which it is attached to the shaft C. Upon the lower surface of the burr-plate are wings e , by which the meal is swept through an aperture into the spout H. Fixed screw-threaded studs u project upward from the surface of the plate P near its outer margin and receive between the two nuts T T' arms S, extending outward from the edge of the upper burr-plate, R''. The upper surface of this plate P also bears an annular flange, b , adapted to receive a cylindrical receptacle, a , for the unground grain. By means of the nuts T T' the plane of the upper burr may be adjusted with reference to the lower burr, so that the work of grinding may be equally well done at all parts of the circumference.

Upon the shaft C, above the pinion D, is a balance-wheel, f , having an integrally-formed hub, g , engaging lugs h upon the pinion D. The balance-wheel and pinion are both loosely mounted upon the shaft C, and may, when desired, rotate freely without affecting the upper parts of the mill. Immediately above the balance-wheel a heavy sleeve, i , is secured to the shaft by a set-screw, and upon the wheel's upper surface is a pivoted lever, l , whose end engages with a lug, m , upon the sleeve i . The outer end of the lever lies beneath the free end of a hook fixed upon the wheel. Through the

hook, lever, and wheel passes a wooden pin, *k*, which keeps the lever from rotating about its pivot *j* when pressed by the lug *m*. The pin is of such strength that it may resist the strain of the lever in the ordinary operation of grinding, but may be instantly broken when any refractory substance enters between the burrs. By providing a series of holes for the pin *k* and pivot *j*, or either of them, the relative length of the lever-arms and the strain upon the pin may be adjusted to the character of the material to be ground. In all cases the breaking of the pin allows the lever to rotate about its pivot *j* and pass out of engagement with the lug *m*, disconnecting the power and allowing the burr to stop without displacement.

The shaft *C* is stepped in a rocking bearing, *q*, mounted upon an arch, *p*, which rests upon a frame, *o*, supporting both shafts. The frame *o* (shown in Figs. 1 and 2 and in plan in Fig. 4) is pivoted at *r* to the frame *A* of the mill, and at its other end is supported by a rod, *s*, screw-threaded at its upper end to receive a hand-wheel, *v*, which rests upon a lug, *t*, projecting from the edge of the plate *P*.

By turning the hand-wheel the whole frame *o* is swung about the pivot *r* and the shaft *C*, with the lower burr attached, is raised or lowered to regulate the fineness of the mill's product.

Having now fully described the construction and operation of my invention, what I claim is—

1. In a grinding-mill, a driving-shaft having a gear rigidly fixed thereon and a burr-

shaft bearing a rigidly-attached lug and a loosely-mounted gear meshing with the gear upon the driving-shaft, combined with a lever pivoted at its middle to a bearing rotating with said loosely-mounted gear and having one of its ends normally in engagement with said lug, and a breaking pin fixing the opposite end of said lever to said bearing, whereby the rotation of the power-shaft may be transmitted through said gears, lever, and lug to said burr-shaft, but only so long as the resistance of the burr-shaft is insufficient to break said pin.

2. In a grinding-mill, the combination of a rigid frame, a swinging shaft-support mounted in said frame, means for elevating the free end of said support, a driving-shaft mounted upon said support, a vertical shaft stepped in said support and having a sliding bearing in said frame, a gear fixed upon said driving-shaft, a gear with a connected balance-wheel loosely mounted upon said vertical shaft and meshing with the first-mentioned gear, a lug rigidly fixed upon said vertical shaft, a lever pivoted to said balance-wheel and normally engaging said lug, and a breaking pin adapted to retain said lever in its normal position, substantially as and for the purpose set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GEORGE H. McCULLOCH.

Witnesses:

GEO. E. WINGART,
HENRY WINGART.