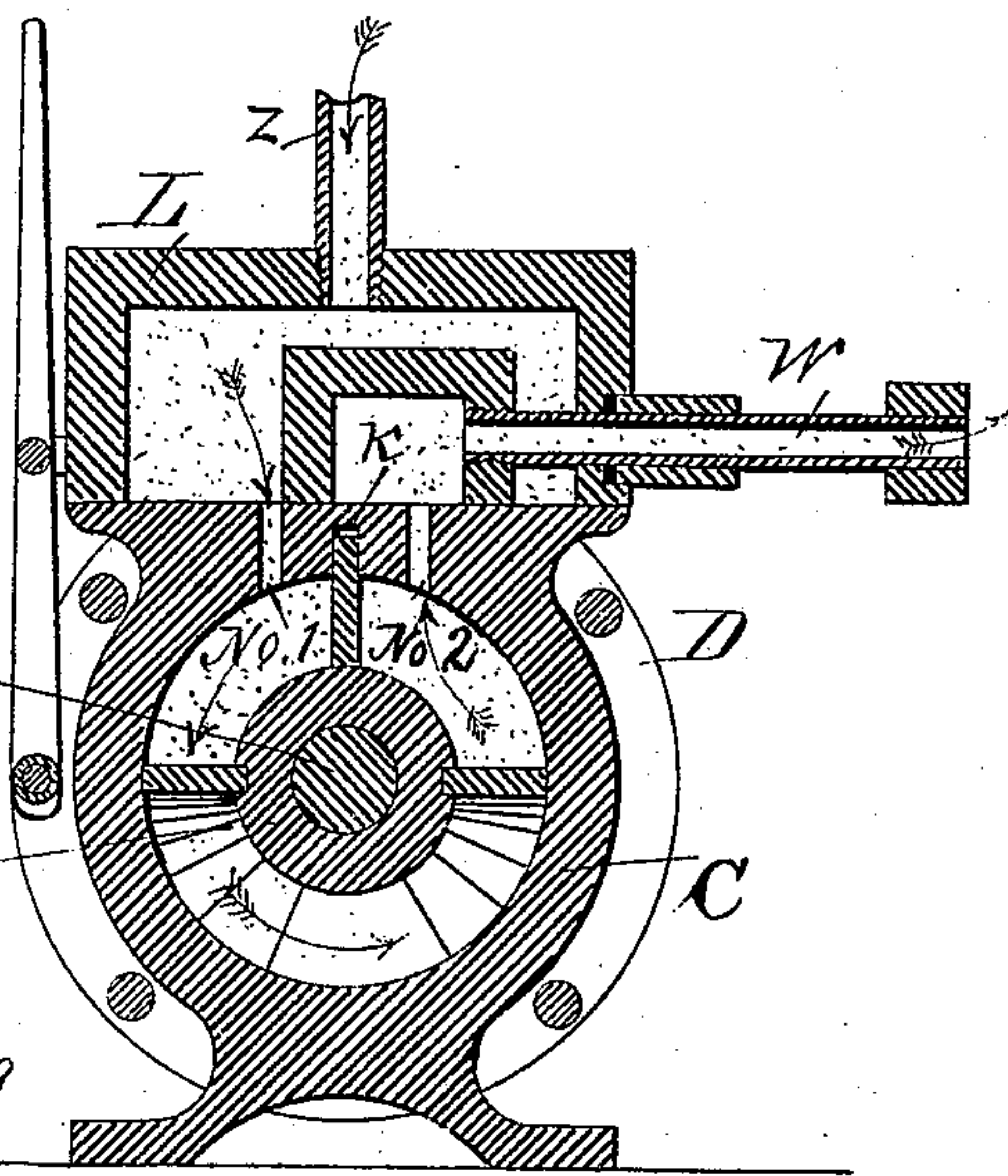
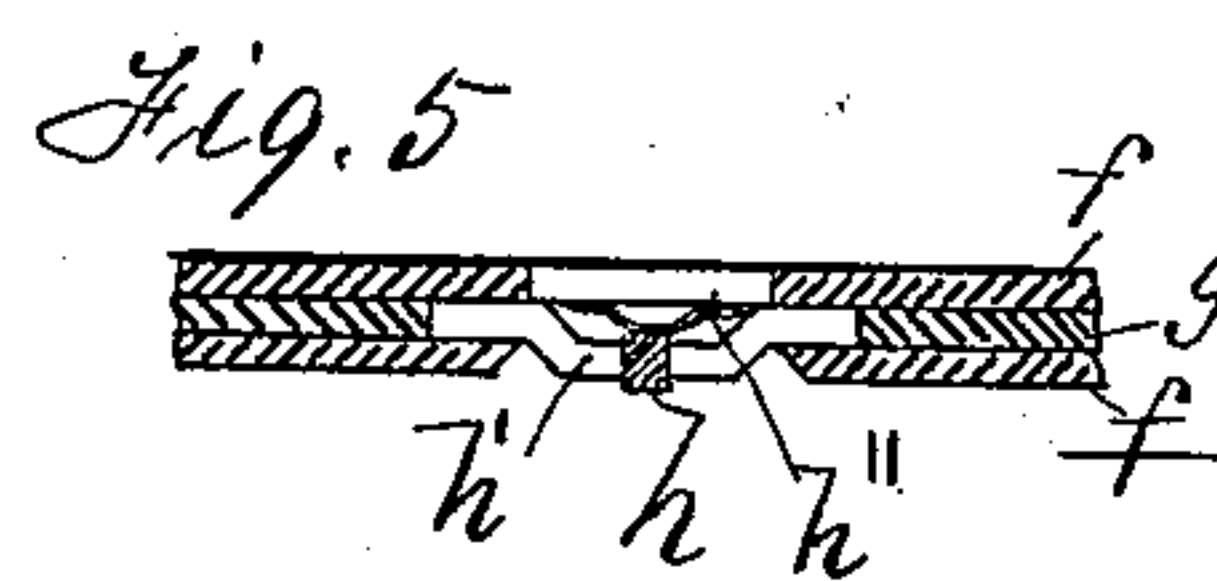
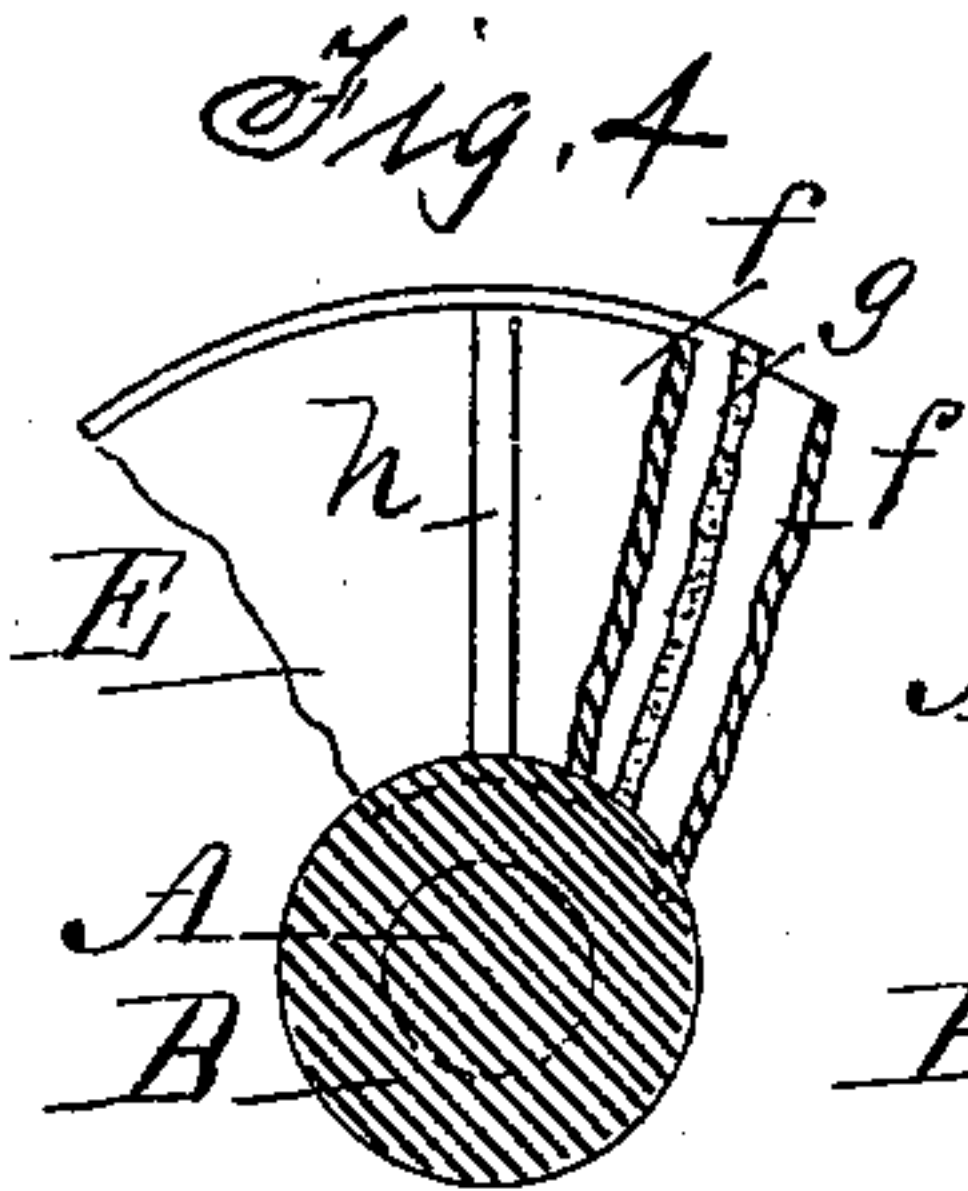
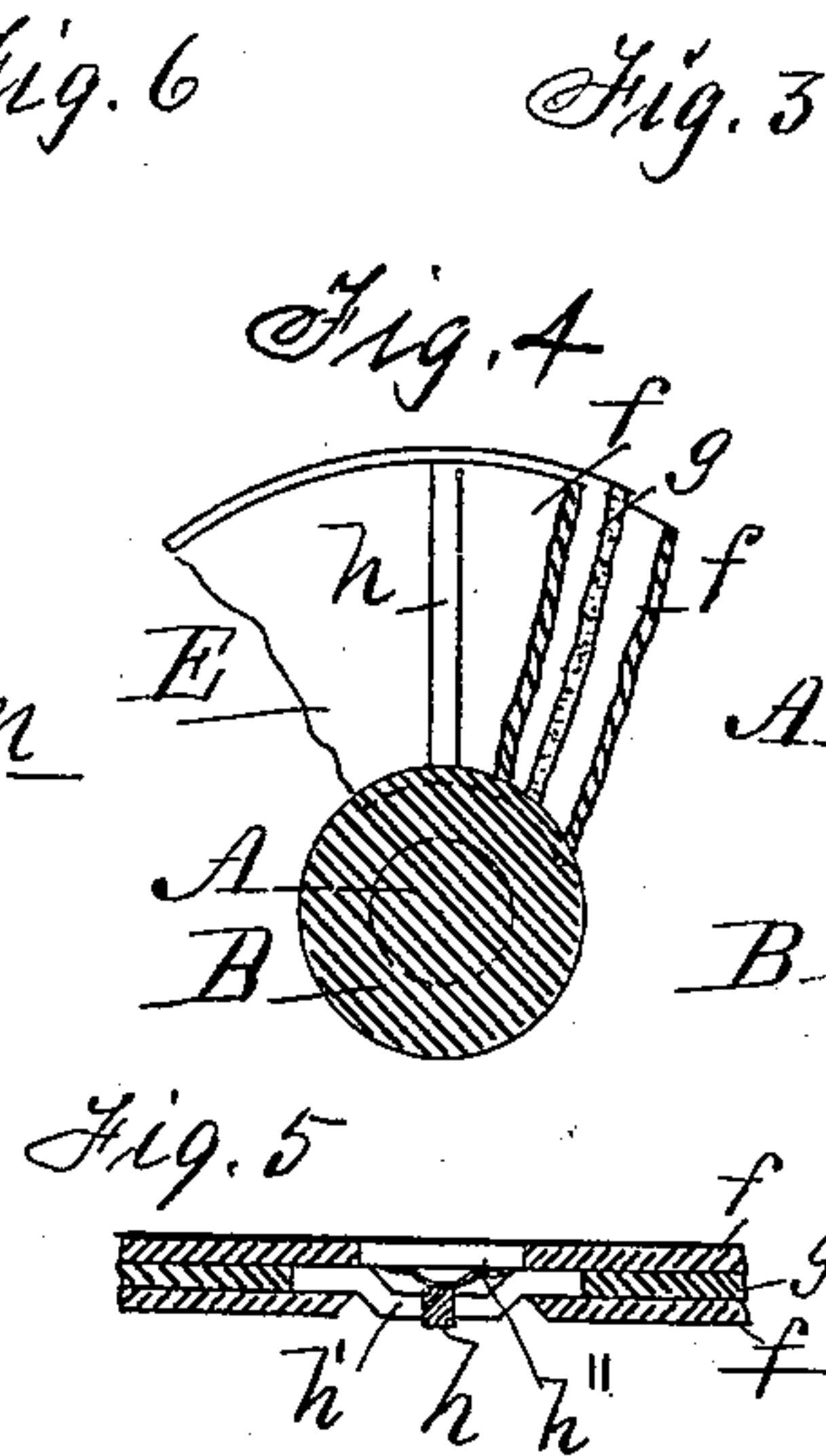
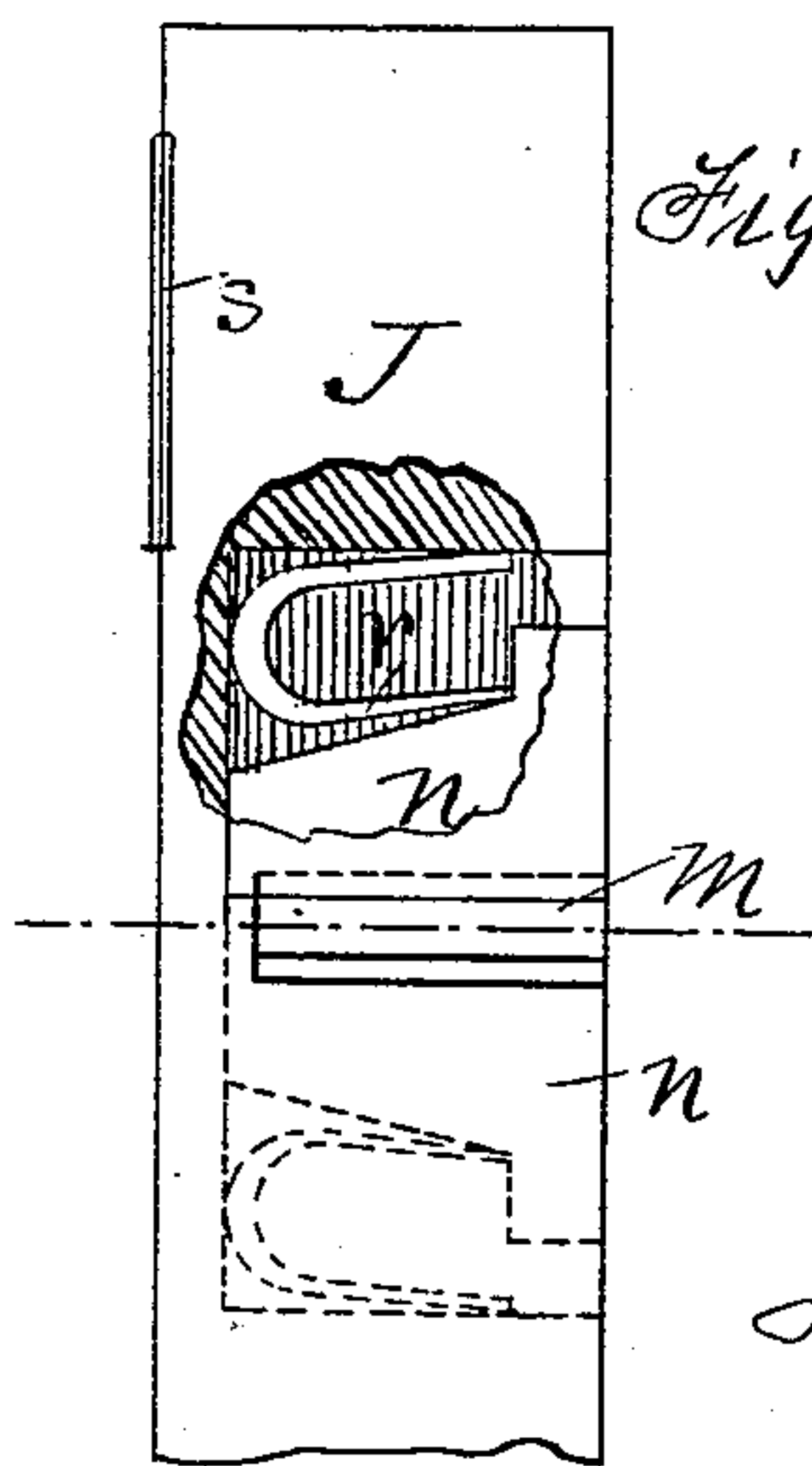
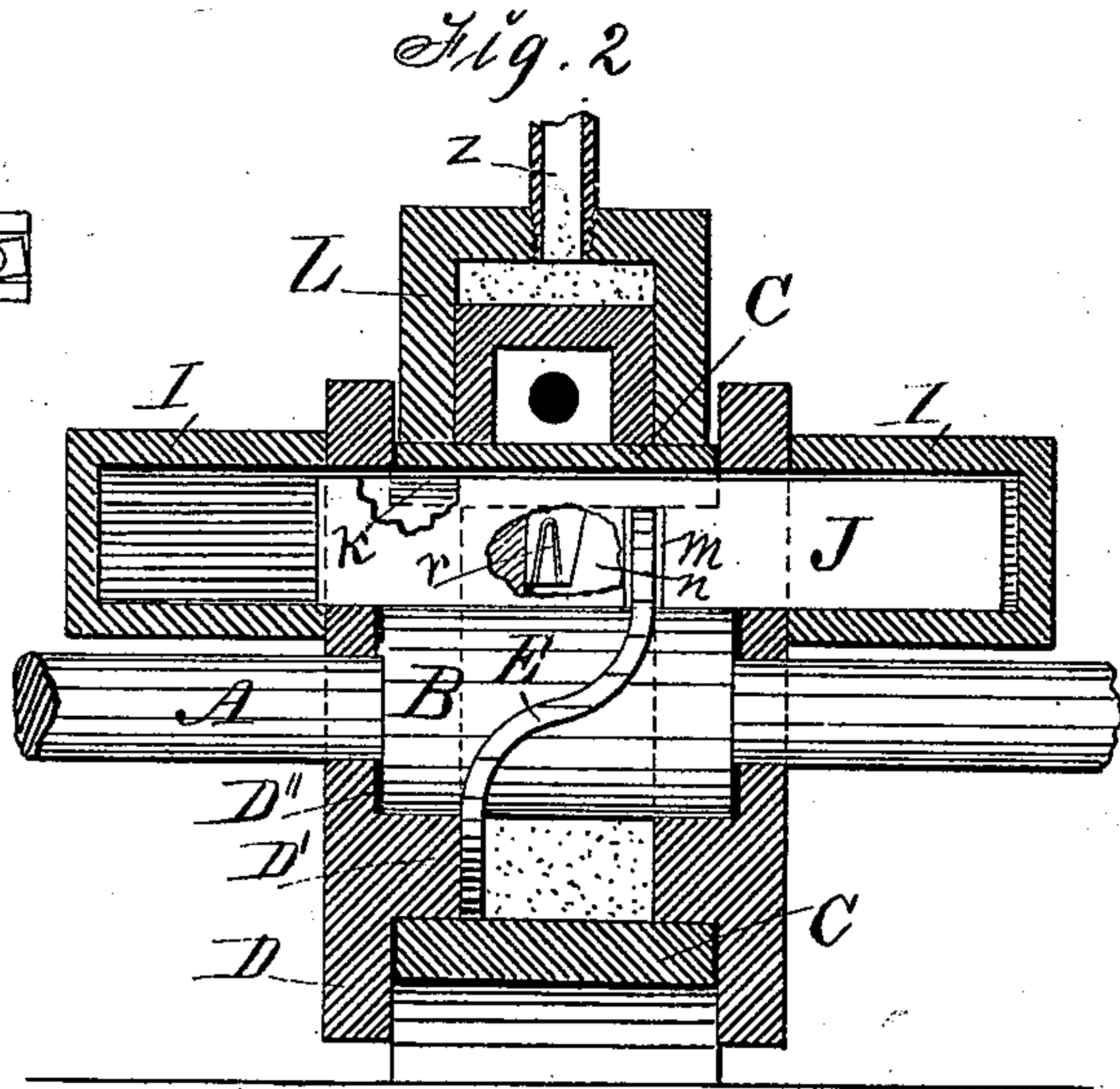
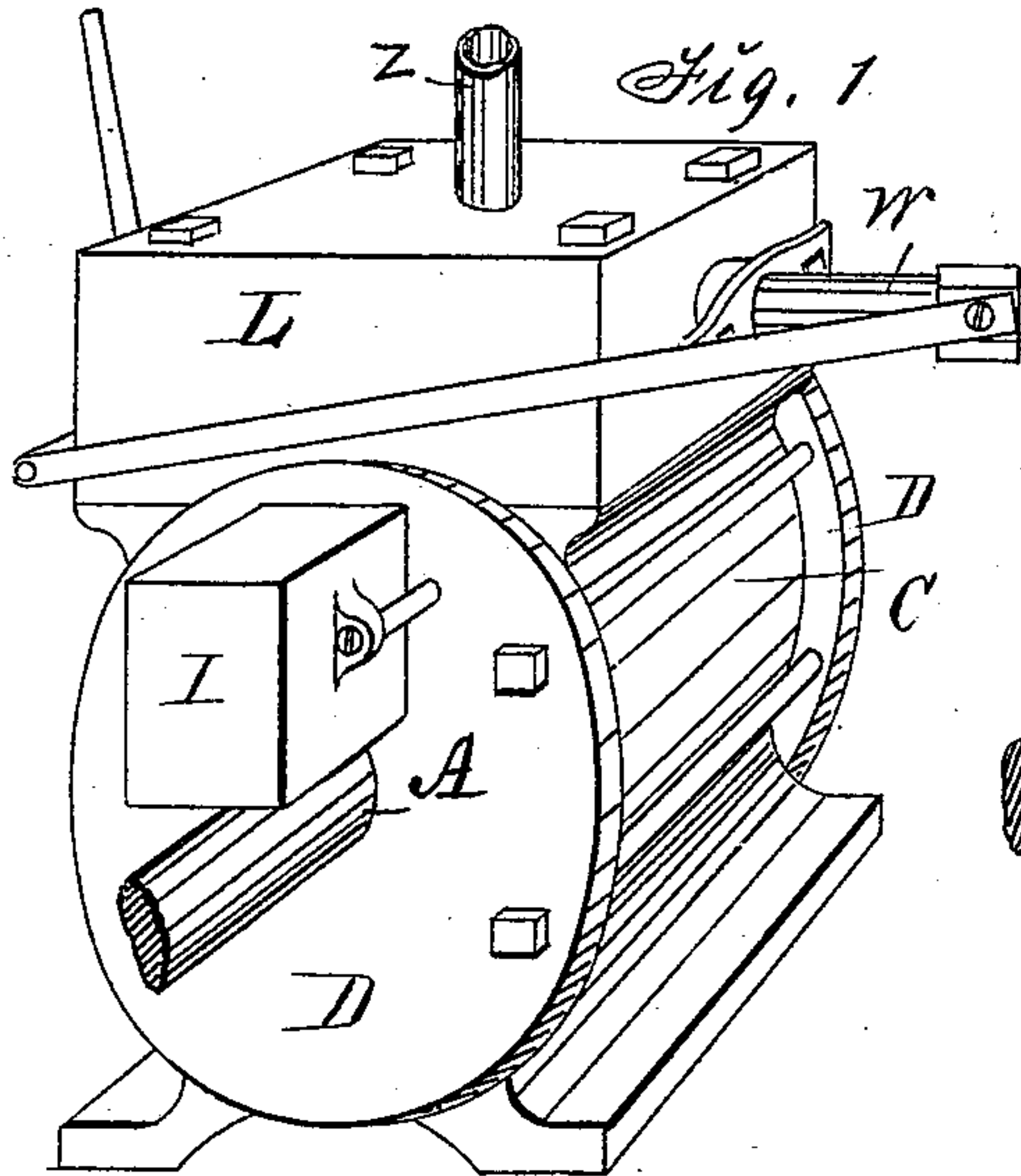


(No Model.)

F. FISCHER.
ROTARY STEAM ENGINE.

No. 250,722.

Patented Dec. 13, 1881.



Witnesses:
B. Schreiner.
Fred Hampton.

Inventor:
Friedrich Fischer,
By Thomas G. Orwig,
Attorney.

UNITED STATES PATENT OFFICE.

FRIEDRICH FISCHER, OF DES MOINES, IOWA.

ROTARY STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 250,722, dated December 13, 1881.

Application filed June 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH FISCHER, of Des Moines, in the county of Polk and State of Iowa, have invented an Improved Rotary Steam-Engine, of which the following is a specification.

The object of my invention is to save material, labor, and expense in constructing an engine, to diminish the size and bulk of an engine of a given capacity, to thereby economize space in locating and operating it, and to augment the power derived from a given quantity of steam.

Heretofore a continuous piston having packing in its periphery has been fixed to a rotating shaft in an inclined position to engage a corresponding groove in a parallel rotating shaft or cylinder. A spiral-shaped piston or cam on a reciprocating rod or shaft has been combined with a steam-cylinder and abutments having cam-shaped planes to produce a rectilinear reciprocating motion, and also a rotary motion.

My invention consists, first, in combining a continuous piston with a rotating shaft and hub and a steam-cylinder in such a manner that it will be in the form of an ellipse, with its ends constantly in direct contact with the heads of the cylinder while at rest or in motion, as required, to constantly maintain two distinct steam-chambers in the cylinder; second, in forming and combining with a cylinder a reciprocating slide to carry self-adjusting abutments from one end of the cylinder to the other, as required, to follow the piston that extends circumferentially and diagonally from the revolving hub in the cylinder, all as hereinafter fully set forth.

Figure 1 of my accompanying drawings is a perspective view of my engine. Fig. 2 is a longitudinal vertical section, and Fig. 3 a transverse section thereof. Fig. 4 is a detail view, illustrating the construction of my piston. Fig. 5 is a transverse section taken through the line *xx* of Fig. 4. Fig. 6 is a detail view, showing the construction of my slide and self-adjusting abutments. Jointly considered, these figures clearly illustrate the construction and operation of my complete invention.

A represents an engine-shaft, and B a hub formed or fixed thereto.

C is a cylinder.

D D are the heads of the cylinder.

D' are annular flanges, that extend inward from the heads D and fit closely between the cylinder C and revolving hub B.

D'' represents suitable packing material placed between the ends of the hub B and the heads D, and around the revolving shaft A, as required, to form a steam-tight connection or stuffing-box, within which the shaft can revolve.

E is my piston, that extends diagonally around the hub B in such a manner that its periphery will be concentric with the hub and cylinder, while its inclined body is an ellipse. The inner edge of the piston is fixed in a corresponding groove formed in the periphery of the hub. The ends of the ellipse engage the side faces of the flanges D' on the heads of the cylinder continuously as the hub and piston is revolved, and the periphery of the piston at the same time engages the inner face of the cylinder, and the cylinder-chamber is thereby continually divided diagonally into two compartments. The piston is composed of two plates, *ff*, and an intermediate plate of packing material, *g*, as shown in Figs. 4 and 5.

h is a sliding section of the piston, that carries a projecting packing, *h'*, that is pressed outward by means of a suitable spring, *h''*, as required, to engage the flanges D', that extend inward from the cylinder-heads. One of these detachable sliding sections is fitted in a corresponding opening formed in each end of the ellipse of the piston.

I I are boxes formed on or fixed to the top portions of the cylinder-heads D, to receive the ends of my reciprocating slide, that carries abutments to engage the revolving piston. Openings corresponding with the box-chambers and the slide are formed in the heads D. A groove, *k*, (shown in Figs. 2 and 3,) is also formed in the under side of the top portion of the cylinder C, to receive the upper edge or portion of the slide.

J is the slide that moves in the chambers of the boxes I and the groove *k*, as required, to

maintain a partition between the induction and
 eduction ports Nos. 1 and 2, that extend ver-
 tically through the top of the cylinder from the
 steam-chest L, and in combination with the di-
 vided cylinder-chamber form a steam-circuit.

m is an opening in the under portion and
 longitudinal center of the slide.

n n are detachable and adjustable abutting-
 blocks fitted into corresponding cavities formed
 in the slide L, to extend inward and upward
 from the opening *m*, as shown in Fig. 6.

Springs *r*, placed in the cavities and in rear
 of the blocks *n*, constantly press the blocks to-
 ward each other, as required, to abut against
 the side faces of the revolving piston.

s represents a spring fixed on the top edge
 of the slide to keep the lower edge of the slide
 pressed upon the periphery of the revolving
 hub, as required, to maintain a steam-tight
 connection therewith.

w represents a tubular stem and eduction-
 tube, connected with the reversible slide-valve
y in the steam-chest L. It passes outward
 through a stuffing-box fixed in or to the end of
 the chest, and is operated by means of a suit-
 able lever, to serve as a means for adjusting
 the valve and reversing the motion of the en-
 gine, and also as an eduction-tube to carry off
 the exhausted steam.

z represents a tube, through which steam is
 admitted into the chest L.

By simply forming an opening in the bottom
 of the cylinder my invention can be advan-
 tageously used as a hydraulic engine or water-
 motor.

To vary the power and capacity of my engine
 I simply vary the size.

From the detail specifications of the construc-
 tion and function of each part of my invention
 their unitary operation is obvious, and any prac-
 tical mechanic will be enabled thereby to con-
 struct my improved engine and operate it.

I claim as my invention—

1. In a rotary engine, the combination of a
 continuous and circumferentially-inclined pis-
 ton having packing in its periphery, and also
 at its ends, a rotating hub or shaft, and a steam-
 cylinder, substantially as shown and described,
 to operate in the manner set forth, for the pur-
 poses specified.

2. In a rotary engine, the slide J, having an
 opening, *m*, and carrying self-adjusting abut-
 ting-blocks *n*, the cylinder C D, having boxes
 I at its ends, and the combined shaft and hub
 A B, having a continuous fixed piston, E, ar-
 ranged and combined substantially as shown
 and described, for the purposes specified.

3. The improved rotary engine composed of
 the following elements and specific devices, to-
 wit: the shaft A, having a hub, B, the cylin-
 der C, having ports Nos. 1 and 2 and flanged
 heads D D', the continuous and circumferen-
 tially-inclined ellipse and piston E, having de-
 tachable sections *h* at its ends carrying adjusta-
 ble packings *h'*, the boxes I, the slide J, hav-
 ing an opening, *m*, carrying self-adjusting abut-
 ting-blocks *n*, a steam-chamber, L, and a re-
 versible slide-valve, substantially as shown
 and described.

FRIEDRICH FISCHER.

Witnesses:

J. C. STARR,
 HENRY J. MOHME.