

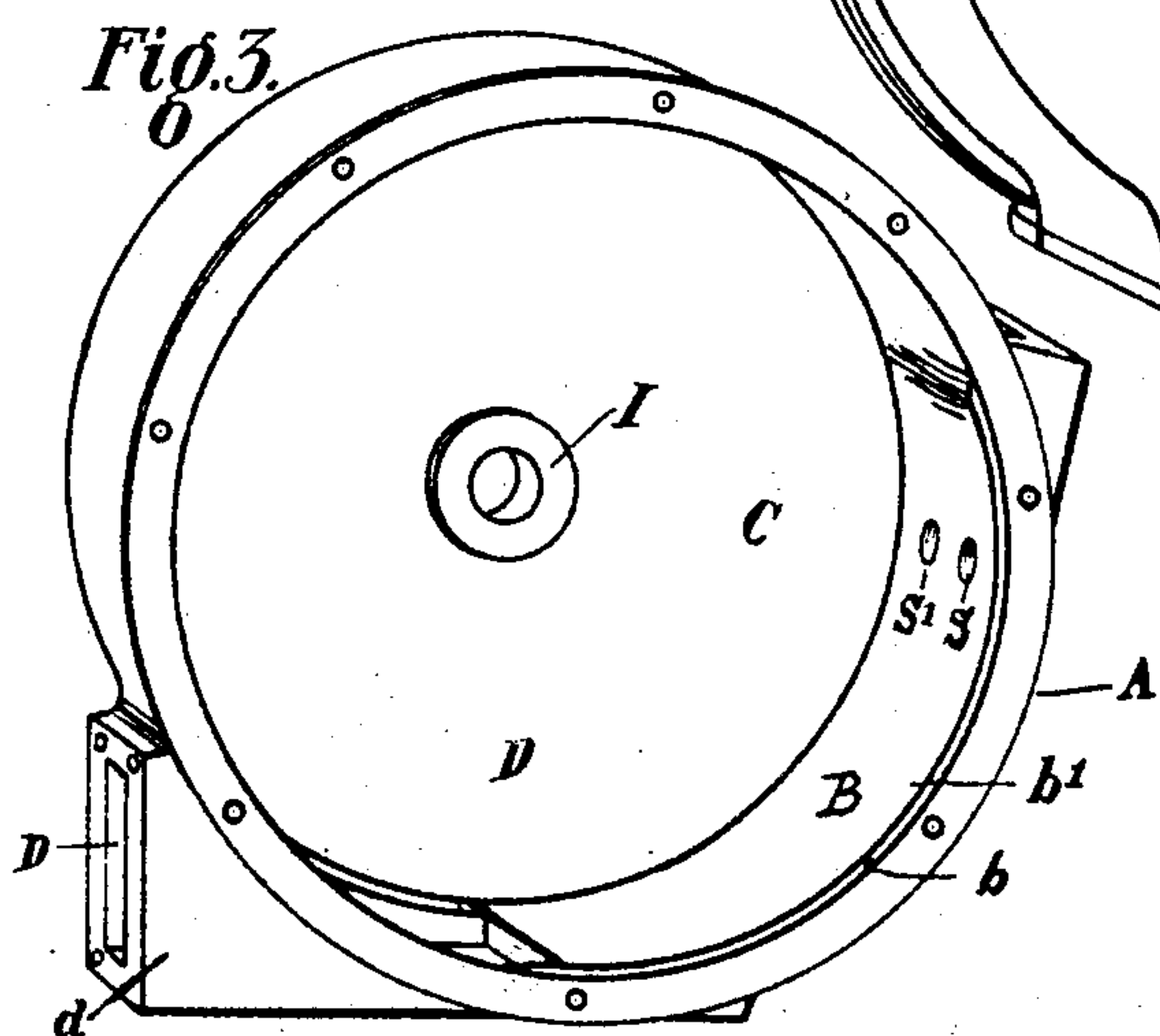
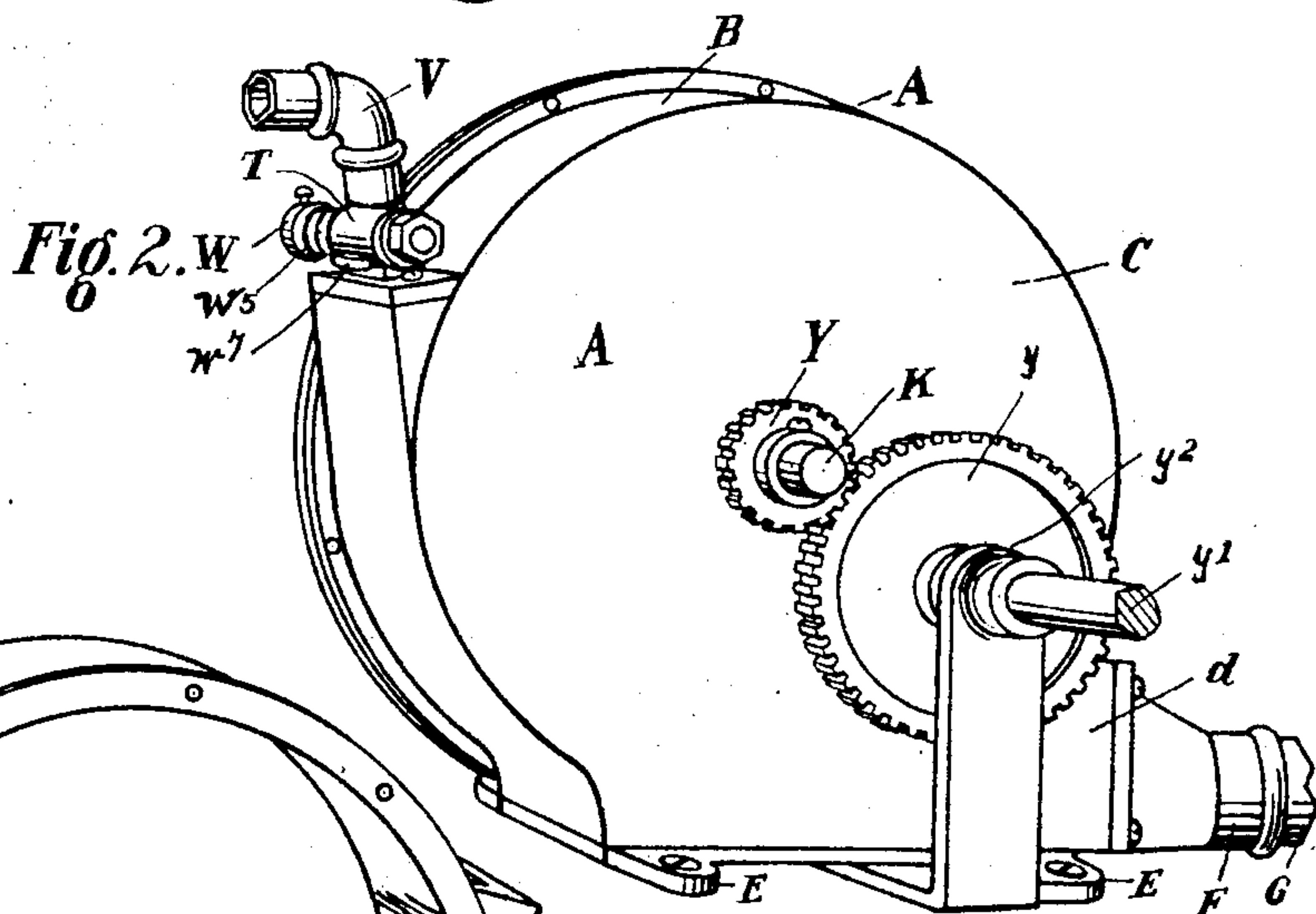
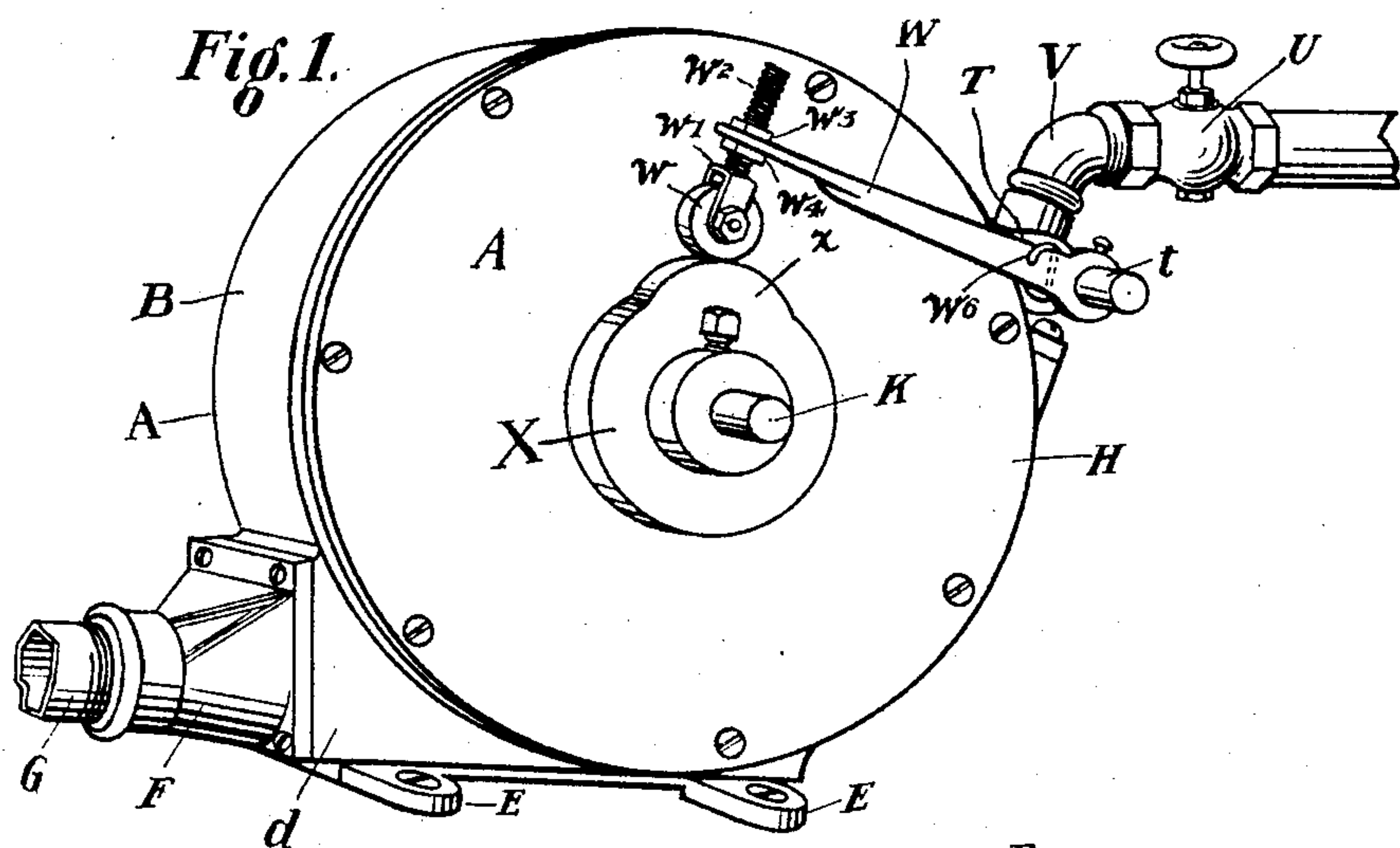
No. 803,595.

PATENTED NOV. 7, 1905.

J. HOFMANN.
FLUID MOTOR.

APPLICATION FILED JAN. 2, 1904.

2 SHEETS—SHEET 1.



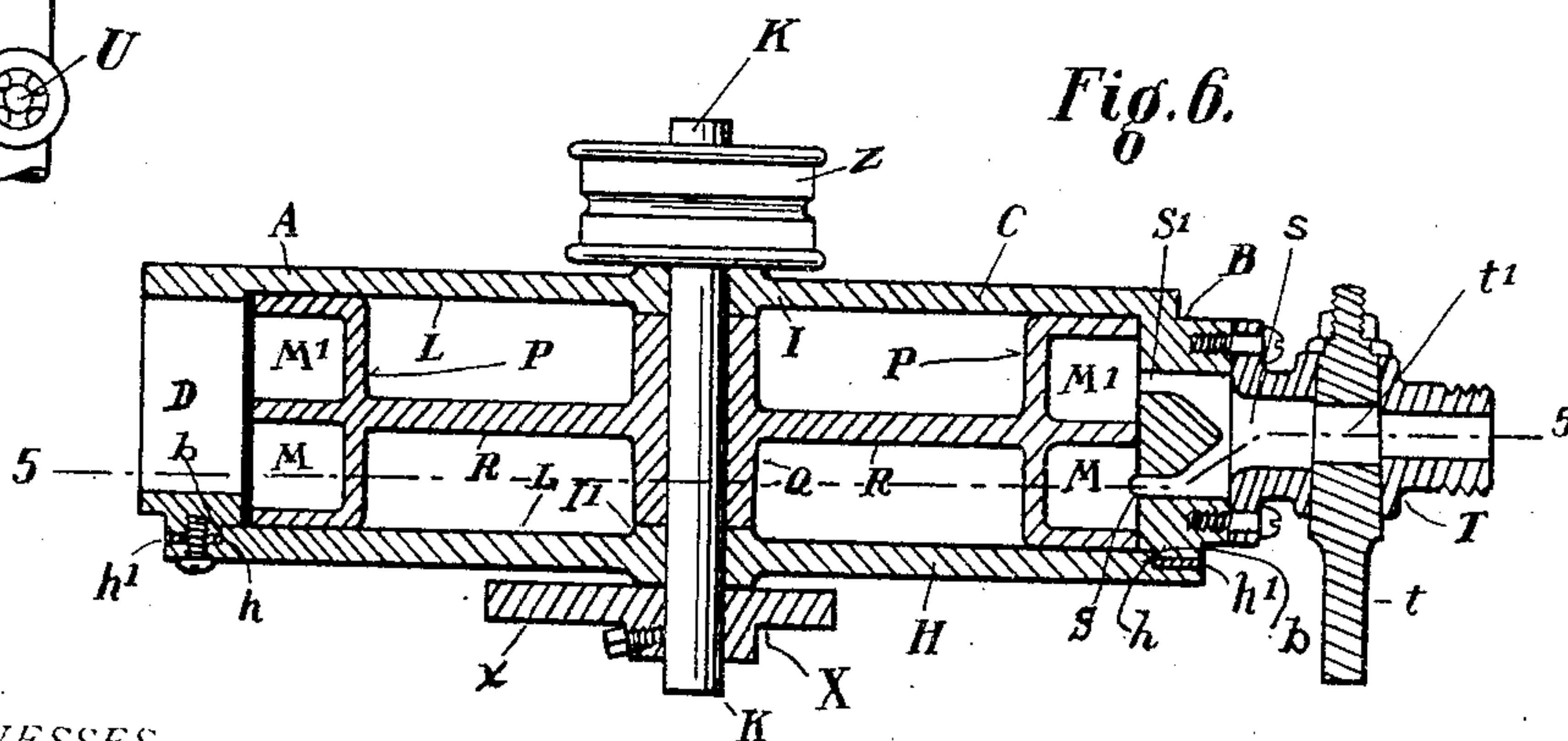
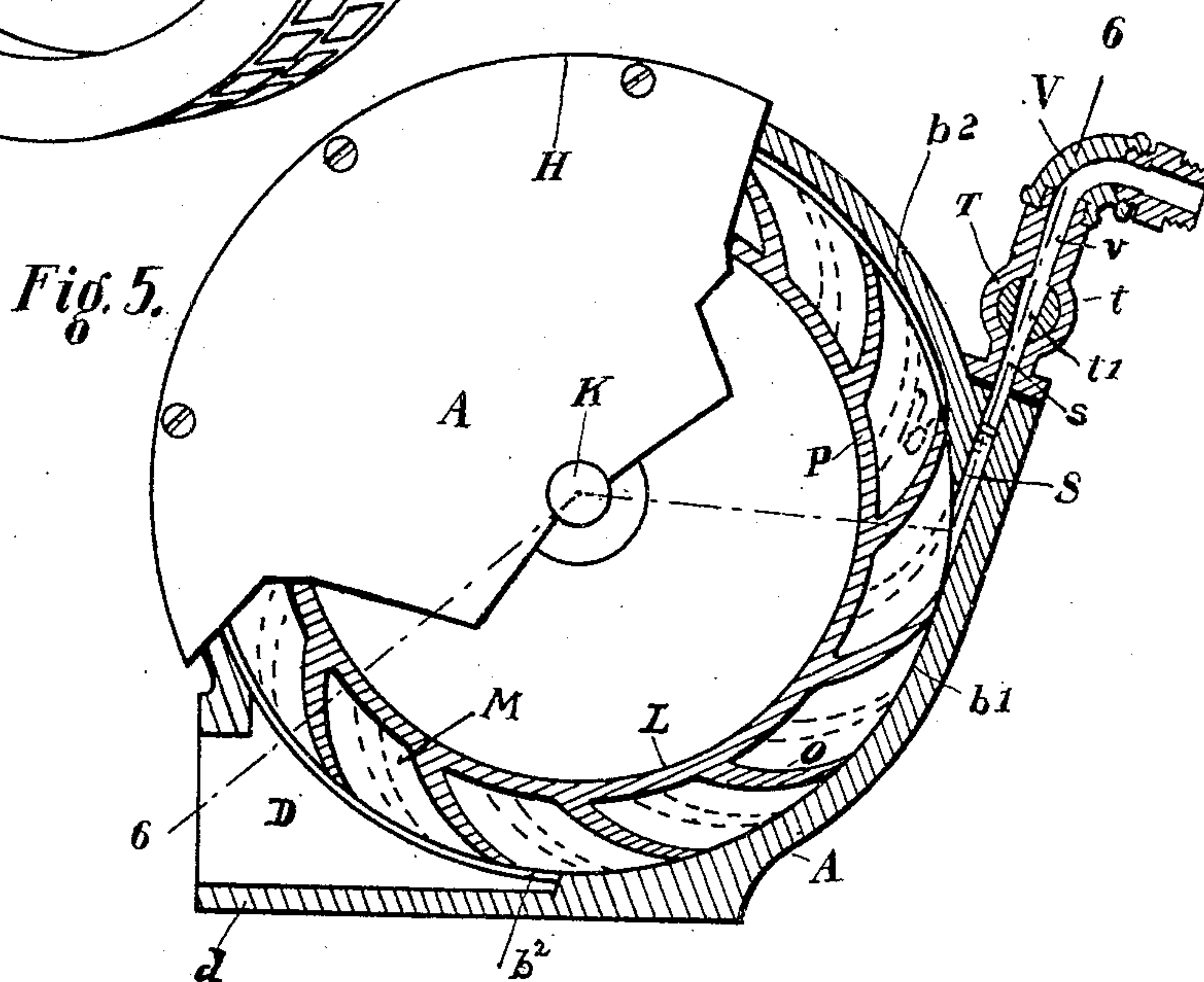
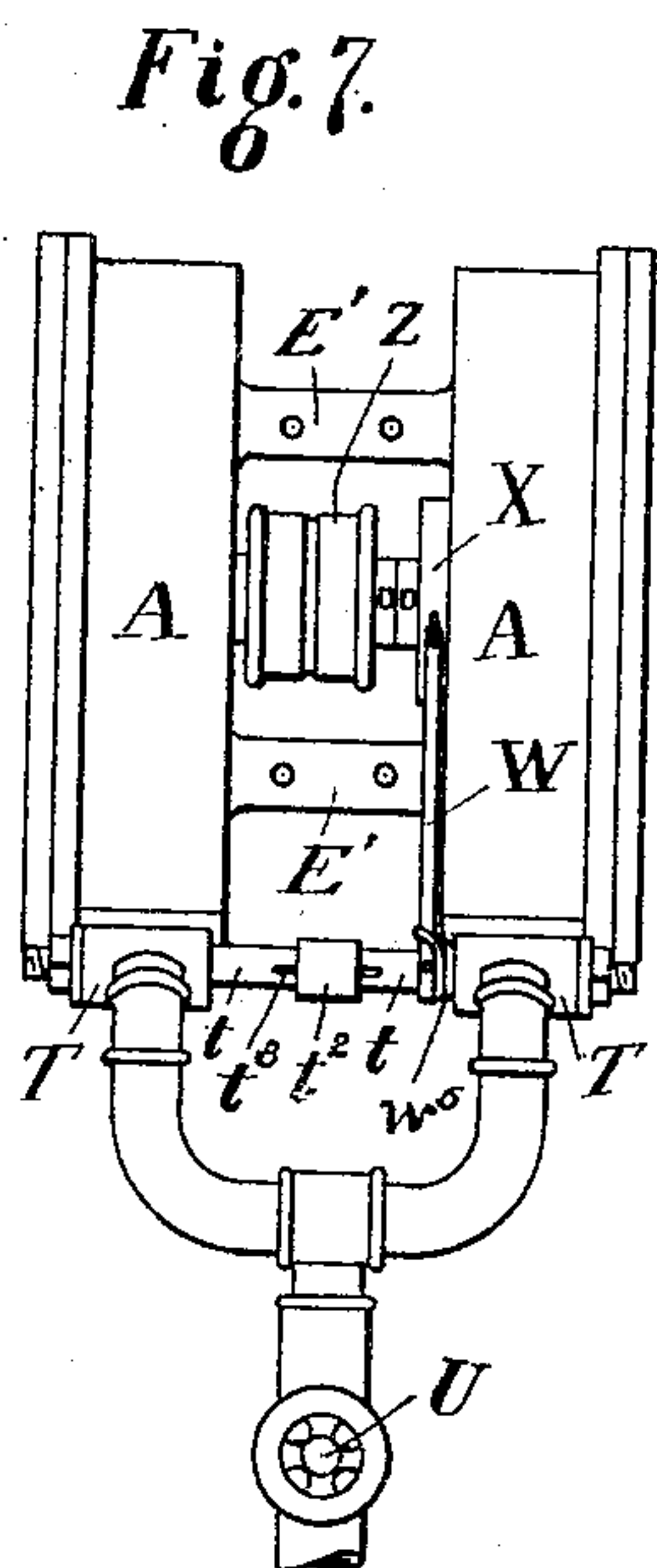
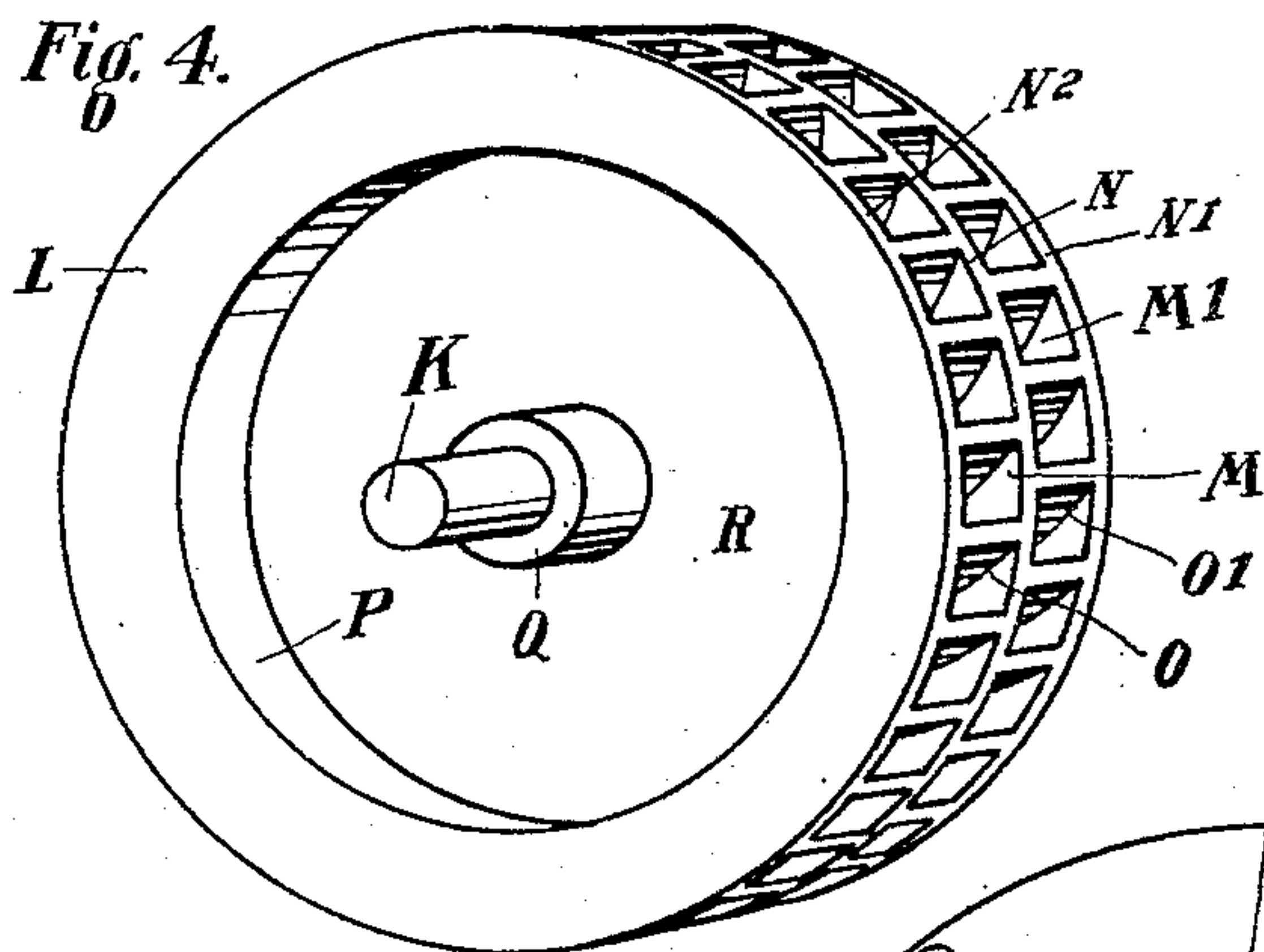
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2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHANN HOFMANN, OF WEST COVINGTON, KENTUCKY, ASSIGNOR OF ONE-HALF TO HARRY F. BITTLINGER, OF COVINGTON, KENTUCKY.

FLUID-MOTOR.

No. 803,595.

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed January 2, 1904. Serial No. 187,542.

To all whom it may concern:

Be it known that I, JOHANN HOFMANN, a citizen of the United States, residing at West Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Fluid - Motors, of which the following is a specification.

My invention relates to fluid-motors—such as water-motors, steam-motors, or the like—and has for its object the providing of a motor of the character mentioned of simple and compact construction of few parts, and the invention will be readily understood from the following description and claims and from the drawings, in which latter—

Figure 1 is a front perspective view of my improved device. Fig. 2 is a rear perspective view of the same. Fig. 3 is a perspective view of the shell, frame, or cylinder of my improved device. Fig. 4 is a perspective view of the power-wheel thereof. Fig. 5 is a side elevation of my improved device, partly in section, on the line 5 5 of Fig. 6. Fig. 6 is a cross-section of the same on the line 6 6 of Fig. 5, and Fig. 7 is a plan view showing my improved device in side-by-side duplex form.

A represents the frame of my improved device, comprising, preferably, a ring B and wall C, forming, preferably, an integral cup or dish-shaped shell having an outlet-port D, (shown in the shape of an outlet-box d ,) the parts just mentioned being preferably made in one casting. Lugs E are provided, by which the frame may be secured to any suitable support or foundation. An outlet-plug F may be suitably secured to the outlet-box. An outlet-pipe G is secured to the plug for leading the exhaust or waste fluid to any suitable point. A plate H is suitably secured to the ring B, constituting a wall for the shell and forming a closed cylinder of the shell. The ring B has an annular rabbet b and the plate H an annular shoulder h , forming guides for centering the plate on the ring. An annular washer h' takes between the plate H and ring B. Bearings I I' for the shaft K of the fluid-wheel L are located in the end walls of the cylinder, the fluid-wheel shaft being journaled in the bearings and the fluid-wheel rotating within the cylinder. The fluid-wheel is preferably made of one casting and comprises a plurality of rows of fluid-sockets M M', arranged in alternately-progressive po-

sitions about the periphery of the fluid-wheel, an annular flange or flat ring N thereabout separating the series of rows of sockets. Similar annular flanges or flat rings N' N² are provided at the outer edges of the fluid-wheel, the flanges forming side walls for the fluid-sockets. The end walls of the sockets are formed by curved ribs O O', extending in curved form tangentially of the fluid-wheel and extending in the general direction of the inflow of the fluid, and with the annular rims P, which constitute the bottoms of the sockets, form pockets, by which the fluid under pressure is received. The fluid-wheel has a hub Q, connected with the rims P by a web R.

S S' represent the inlet-ports for the respective series of sockets or pockets.

T is an inlet-valve, and U a shut-off valve for the fluid under pressure. The inlet-valve stem t has a passage t' , communicating with the passage s of the inlet-ports and the fluid-passage v of an inlet-pipe V. By turning the inlet-valve stem the passage of fluid is regulated, or, if desired, entirely shut off, it being the intention, however, to employ the inlet-valve T for the purpose of regulating or setting the degree of flow of fluid into the motor, the valve U being employed, preferably, for shutting off the passage of fluid entirely or admitting the fluid when the motor is put into operation.

For governing the flow of fluid into the motor I provide the governor, comprising, preferably, the valve-stem t , with a lever W, preferably firmly secured to the valve-stem, and also provide the fluid-wheel shaft with a guide-wheel X, preferably having one or more cams w , the lever being permitted to ride on the guide-wheel, as by having an antifriction-roller w contacting with the guide-wheel, the roller being journaled in a stem w' , having a threaded end w^2 taking through an opening in the swinging end of the lever and positioned with relation to the lever by having nuts $w^3 w^4$ screw about the stem w' for throwing the lever proper radially farther from or permitting it to project closer to the axis of the fluid-wheel shaft, thereby affecting the degree of opening or closing of the inlet-valve T. For normally pressing the wheel w upon the guide-wheel I provide a spring w^5 , coiled about the stem t and having one end w^6 bent over the lever, the other end w^7 taking against the valve T.

The inner part of the ring of the frame be-

tween the inlet-port and the outlet-port is provided with a wall b' , shaped on the arc of a circle corresponding to the periphery of the fluid-wheel when the parts are in assembled form for substantially confining the fluid in the pockets of the fluid-wheel until they reach the outlet-port. The balance of the inner face of the ring may, as shown, be arranged on a circle of greater diameter, as shown at b^2 .

10 The fluid-wheel shaft may be provided with a pulley Z or other power-transmitting device, or, as shown in Fig. 2, may have a pinion Y secured thereto, meshing with a gear y on a shaft y' , journaled in a bracket y^2 , secured to the frame for transmitting power when it is desired to reduce the speed and increase the power transmitted from the motor-shaft.

My improved motor is especially useful as a water-motor and is arranged to be connected to the ordinary water-service of a city or town or any desirable water-supply, the pressure of the water service or supply in practice of course varying, and to compensate for this variation in pressure at installation and to regulate the motor for compensating for the various degrees of pressure that may obtain periodically in a given system of water-supply I provide the governor above described. In the form shown the farther the outer or swinging end of the lever is removed from the axis of the fluid-wheel shaft the less will be the flow of fluid into the motor, the cam on the guide-wheel being for the purpose of periodically still further closing off the supply during the operation, and thereby preventing the motor from overrunning itself; but I prefer to limit the flow of fluid into the motor only partially at any time. In operation my improved motor is capable of revolution at a very high rate of speed and of attaining a speed of two thousand five hundred to three thousand revolutions per minute at the fluid-wheel shaft. Regularity in revolution is obtained by means of having the pockets of the respective series of pockets arranged in alternately-advancing position, so that one or the other of the series will always be receiving its full quantum of fluid, the fluid being received successively by the respective series of pockets.

In Fig. 7 I have shown my improved device in side-by-side duplex form, the frames A A

being respectively of right and left form connected by webs $E' E'$, having holes for receiving fastening lag-screws, the valve-stems $t t$ being connected by a telescope connection t^2 for permitting relative longitudinal movement of the valve-stems to permit proper fit of the same in their seats, but compelling the same to rock together by reason of the spline connection t^3 .

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

1. In a fluid-motor, the combination of a shell, a fluid-wheel, a shaft for the latter journaled in the shell, a cam guide-wheel X on said shaft, an inlet-valve having a rocking valve-stem t , a lever W secured to said rocking valve-stem, an antifriction-roller w riding said guide-wheel, a stem w' having a threaded end w^2 for said roller, the free end of said lever having an aperture through which the said threaded end takes, nuts $w^3 w^4$ screwing about said threaded end at top and bottom of said free end of said lever, a spring w^5 coiled about said stem t and the rocking axis of said lever and having an end w^6 bent over said lever, constructed and operating substantially as and for the purpose specified.

2. In a fluid-motor, the combination of a pair of shells arranged side by side, a fluid-wheel for each, a shaft for the latter journaled in the shells, a cam guide-wheel X on said shaft, an inlet-valve having a rocking valve-stem t for each shell, said valve-stems having coincident rocking axes and having a telescopic connection t^2 between them for permitting relative longitudinal movement of said valve-stems, and a lever W secured to one of said rocking valve-stems, said valve-stems having connection for causing simultaneous rocking of said valve-stems, the free end of said lever carrying an antifriction-roller w riding said guide-wheel, substantially as described.

In testimony whereof I have signed my name hereto in the presence of two subscribing witnesses.

JOHANN HOFMANN.

Witnesses:

HERBERT F. HARDEN,
HARRY F. BITTLINGER.