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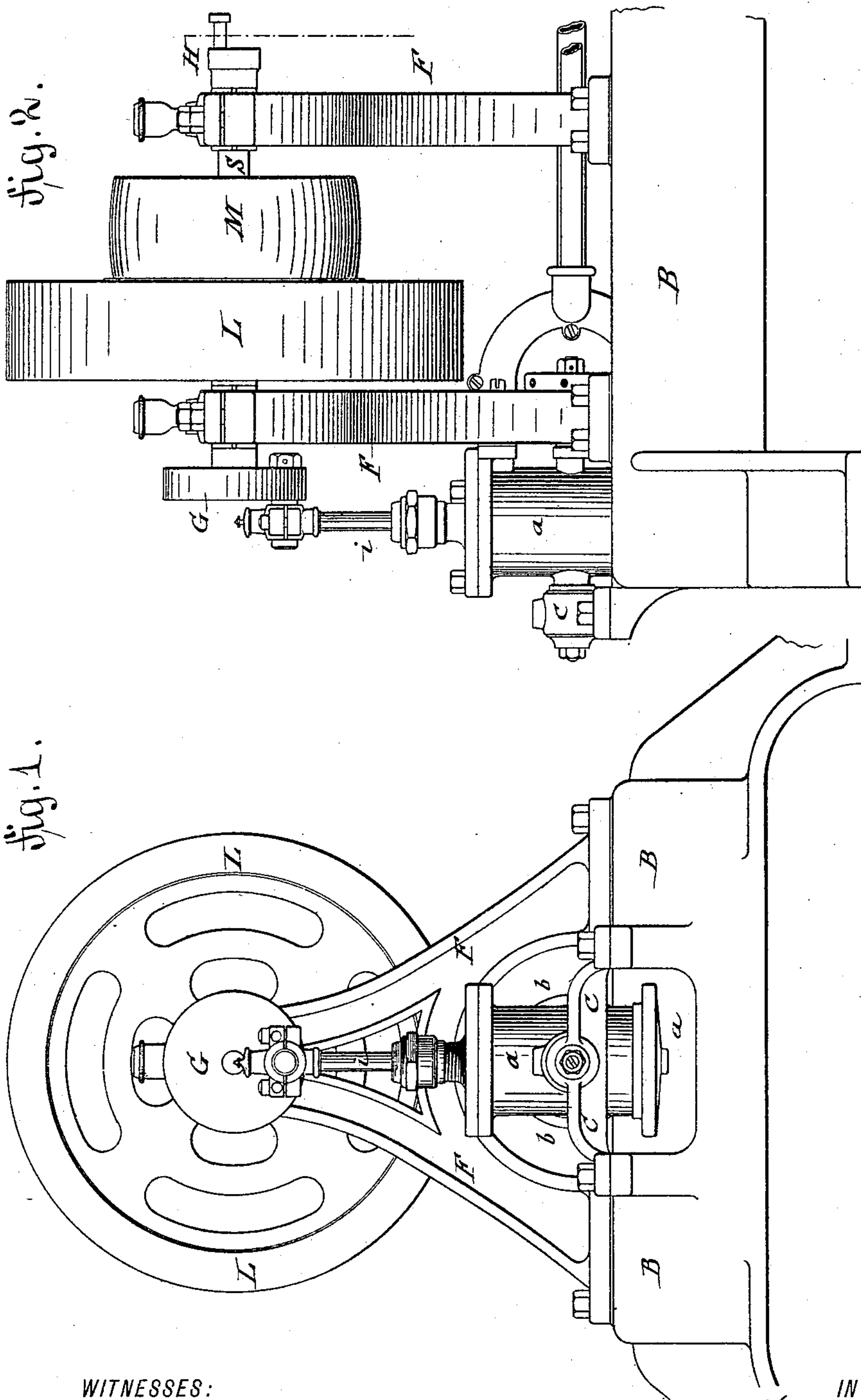
4 Sheets—Sheet 1.

M. ULRICH.

OSCILLATING STEAM ENGINE.

No. 338,890.

Patented Mar. 30, 1886.



WITNESSES:

Ernst Wolff.
Martin Petry.

INVENTOR

Max Ulrich
BY *Goepfer Raegener*
ATTORNEYS.

(No Model.)

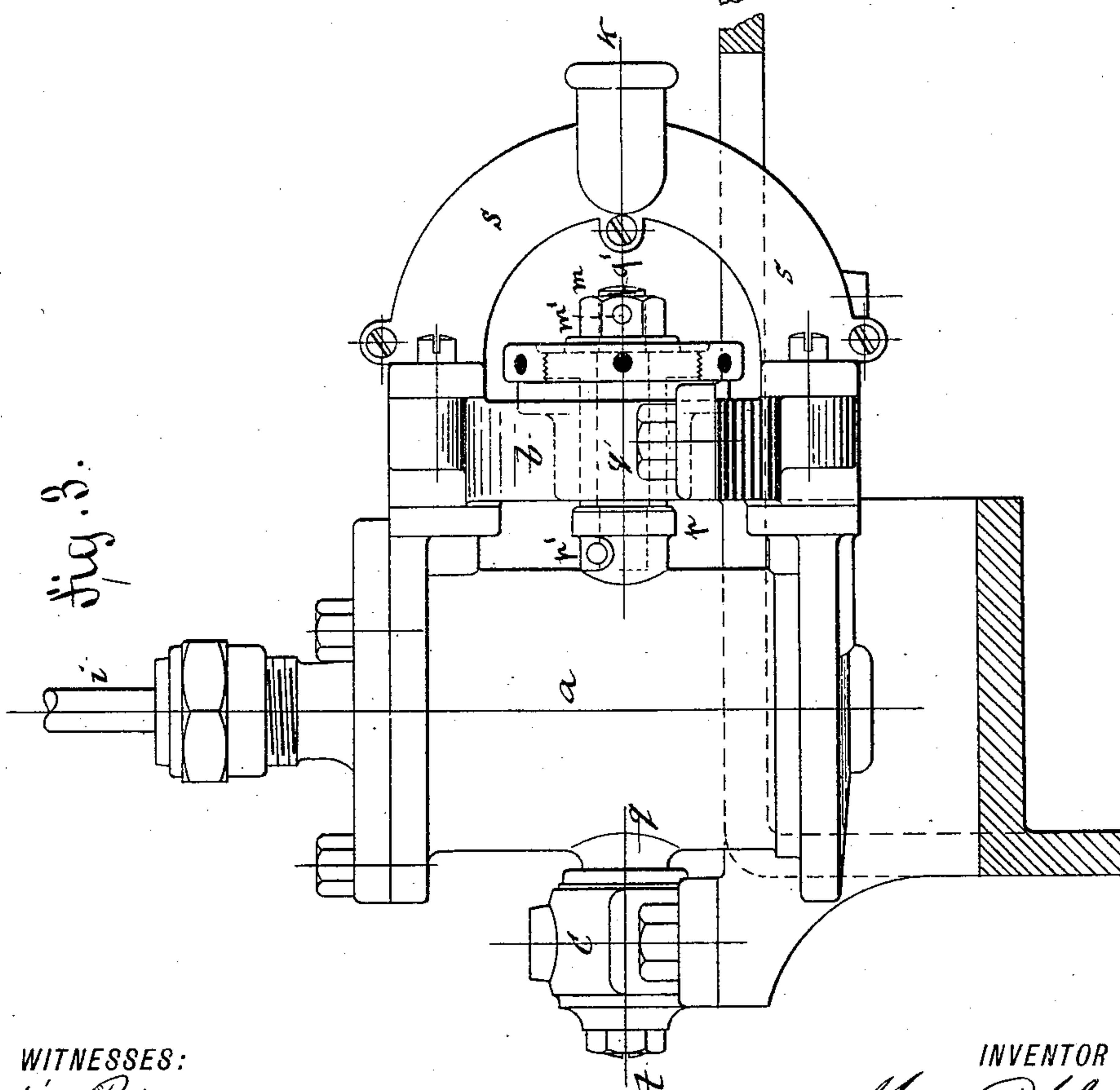
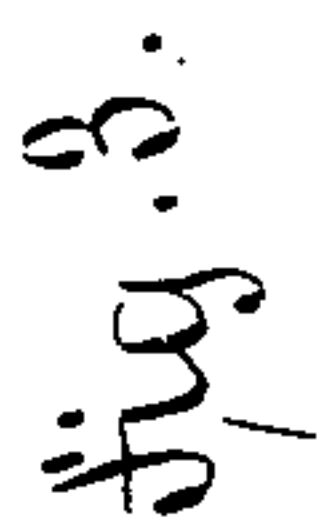
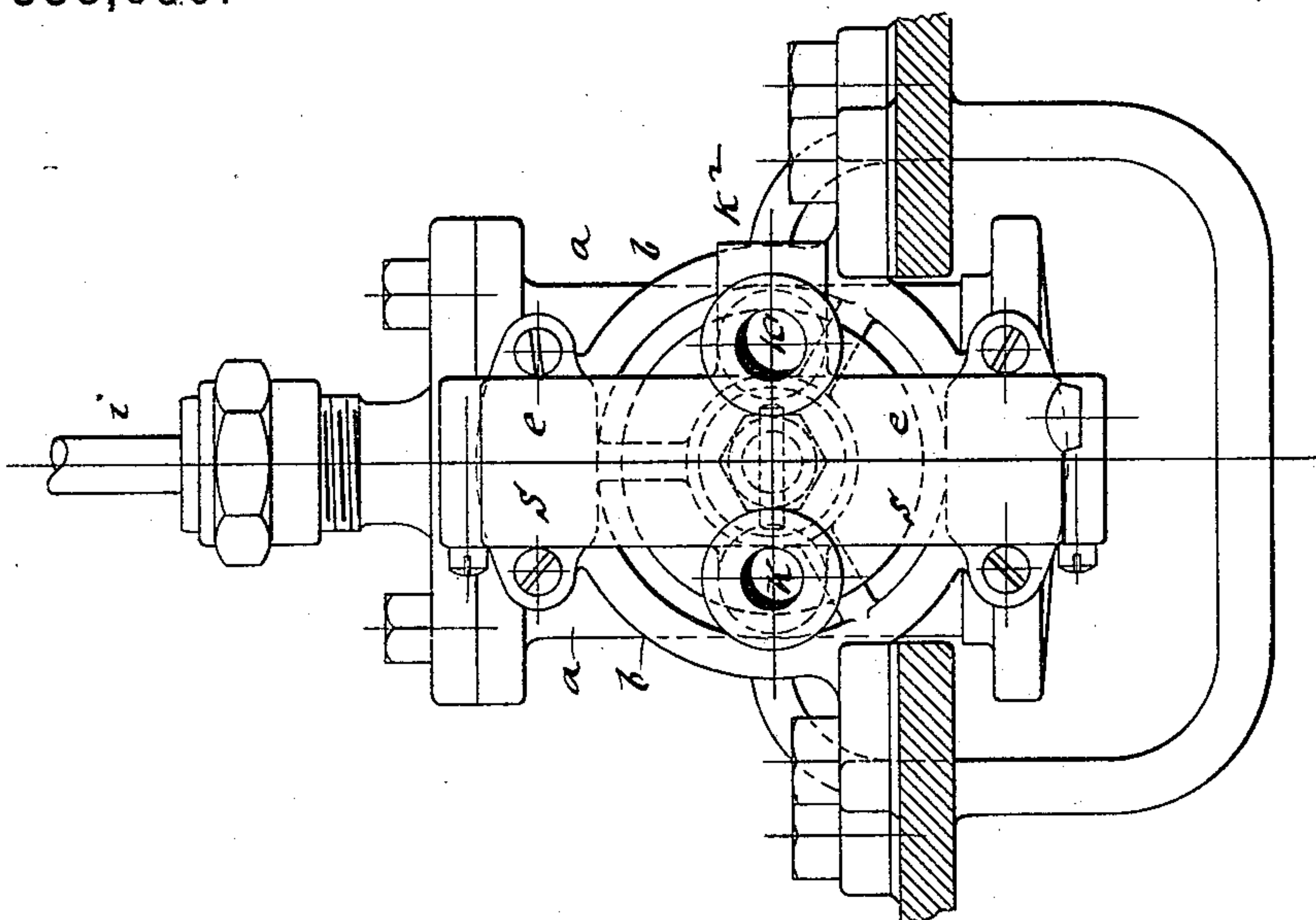
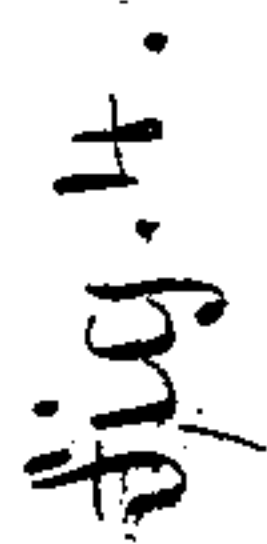
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WITNESSES:

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Martin Petry.
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(No Model.)

4 Sheets—Sheet 3.

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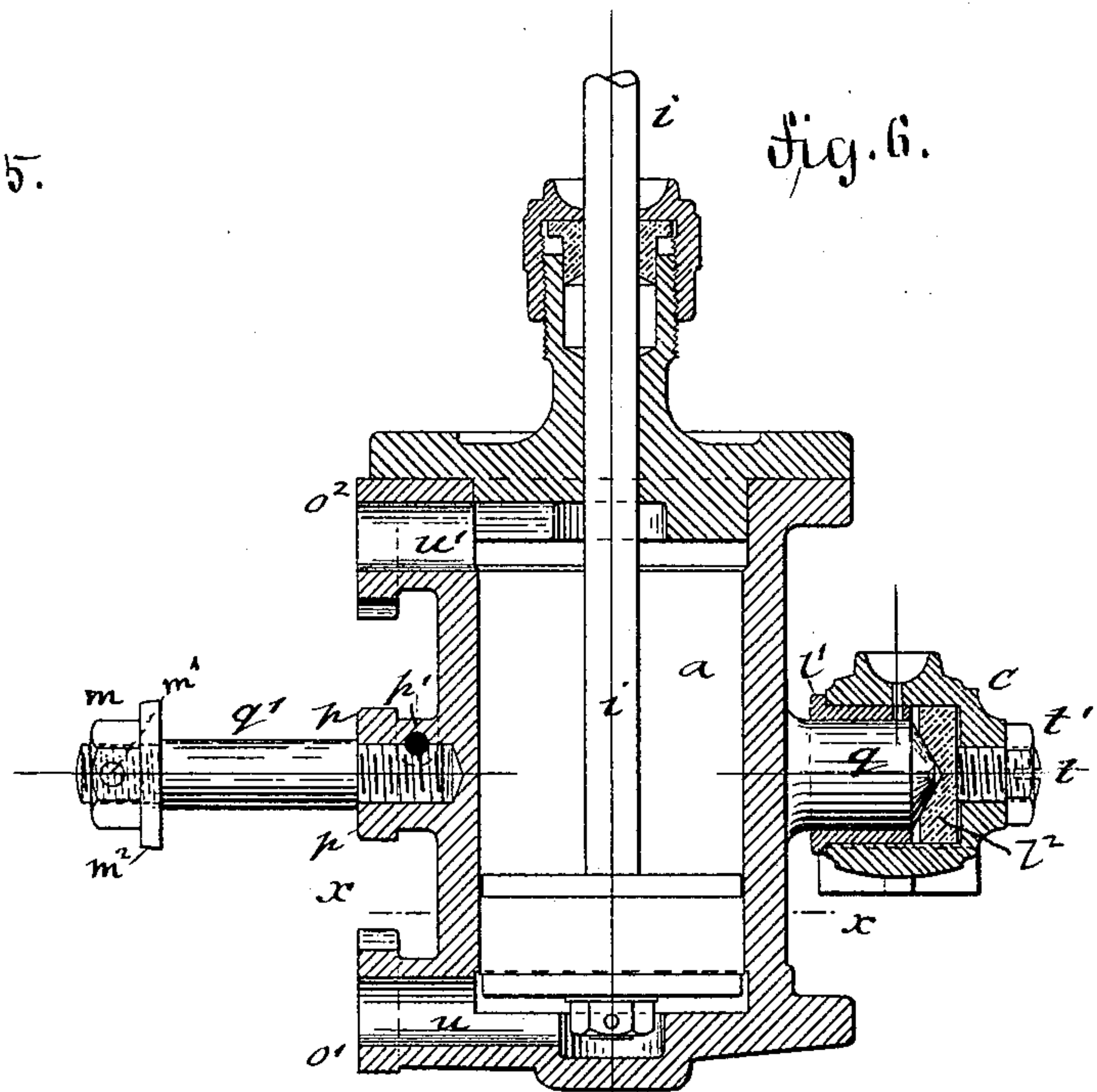
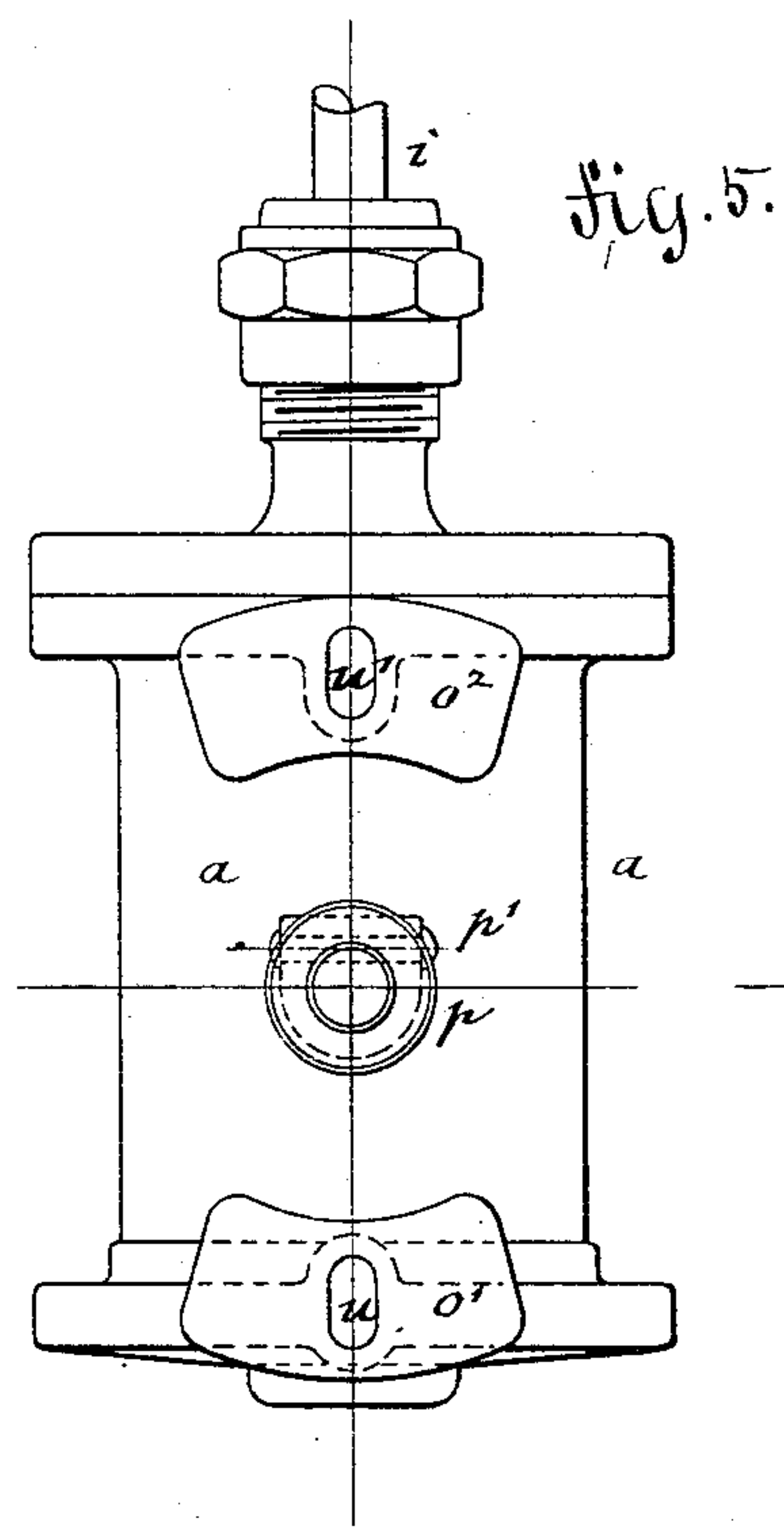
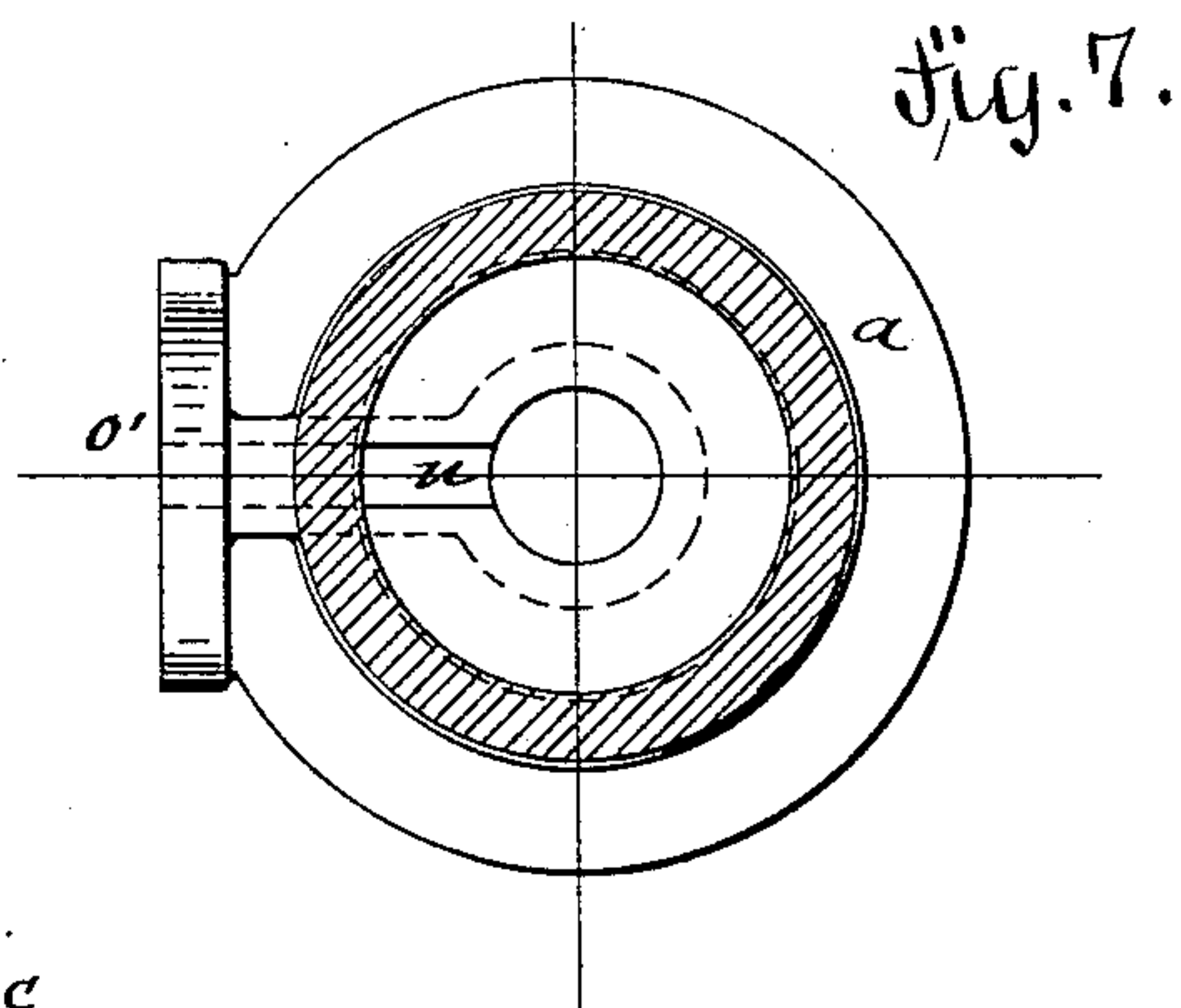
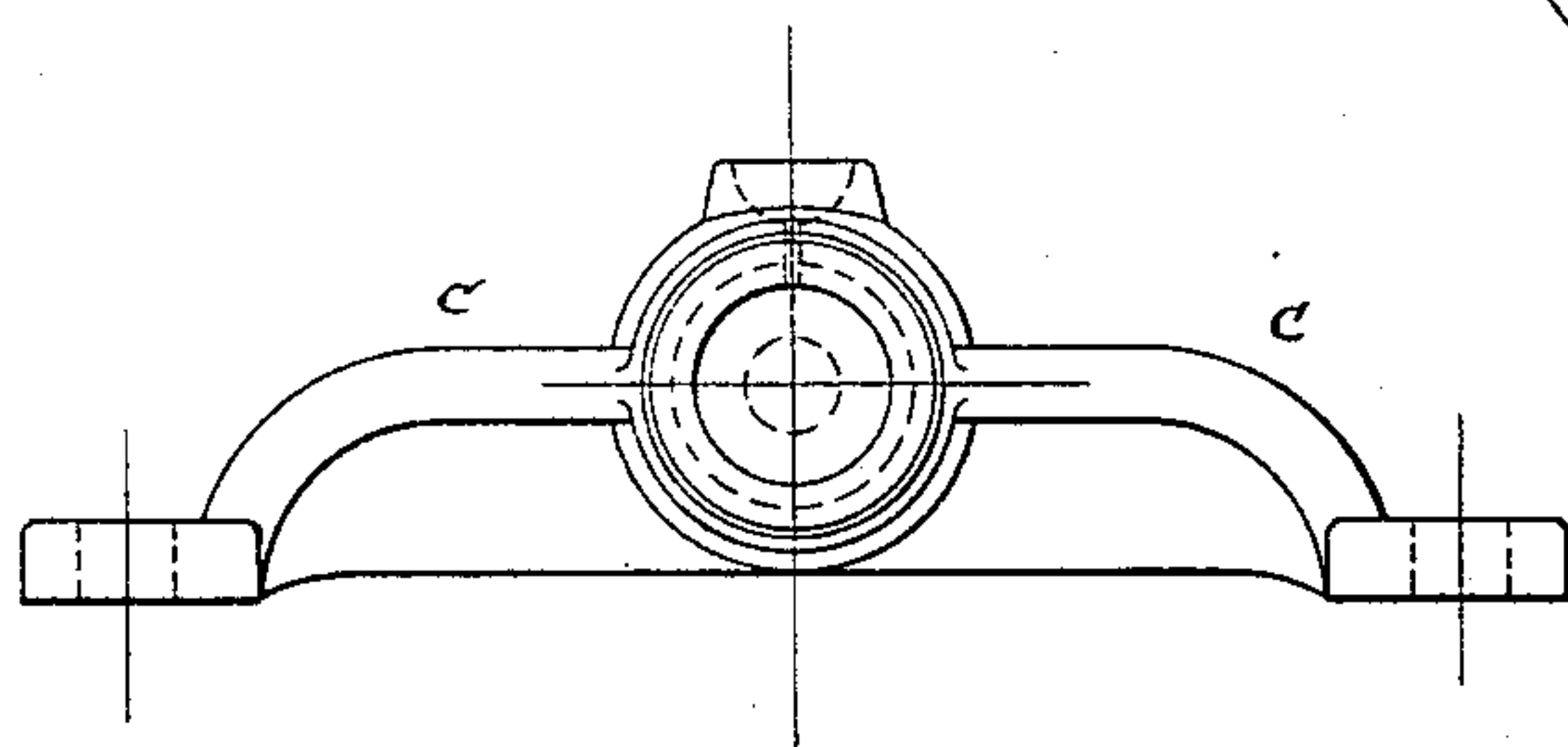


fig. 8.



WITNESSES:
Martin Petry
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(No Model.)

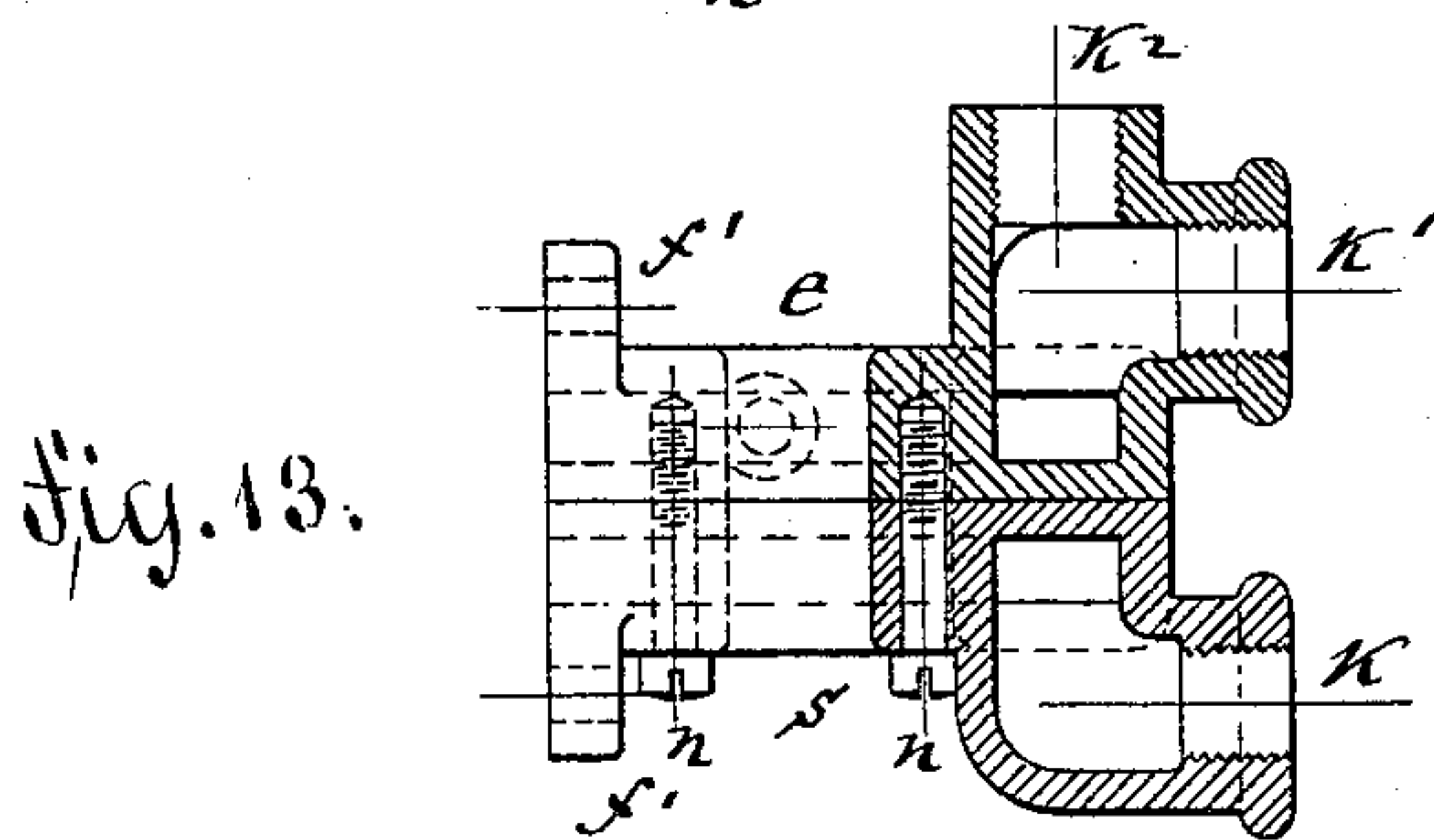
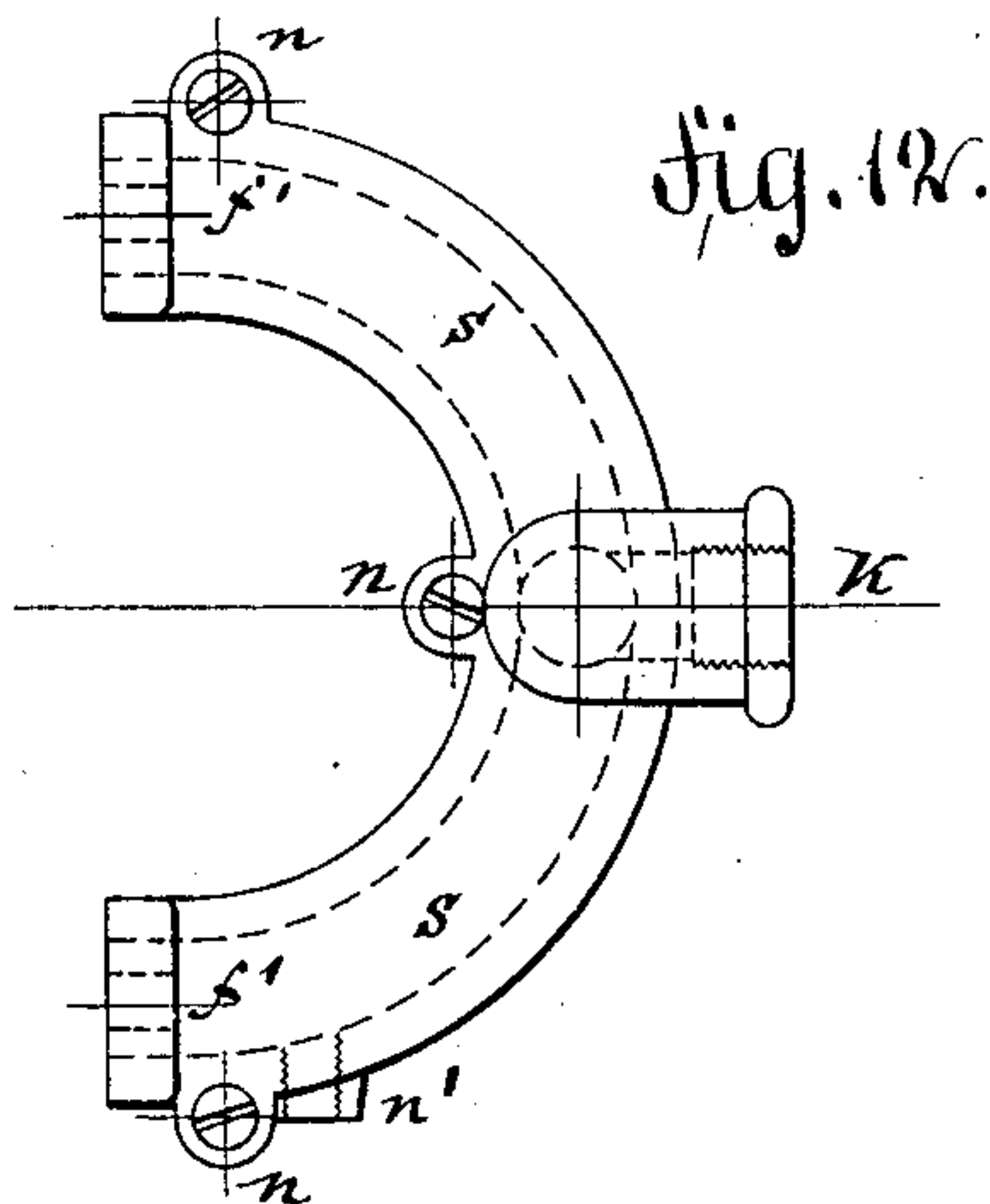
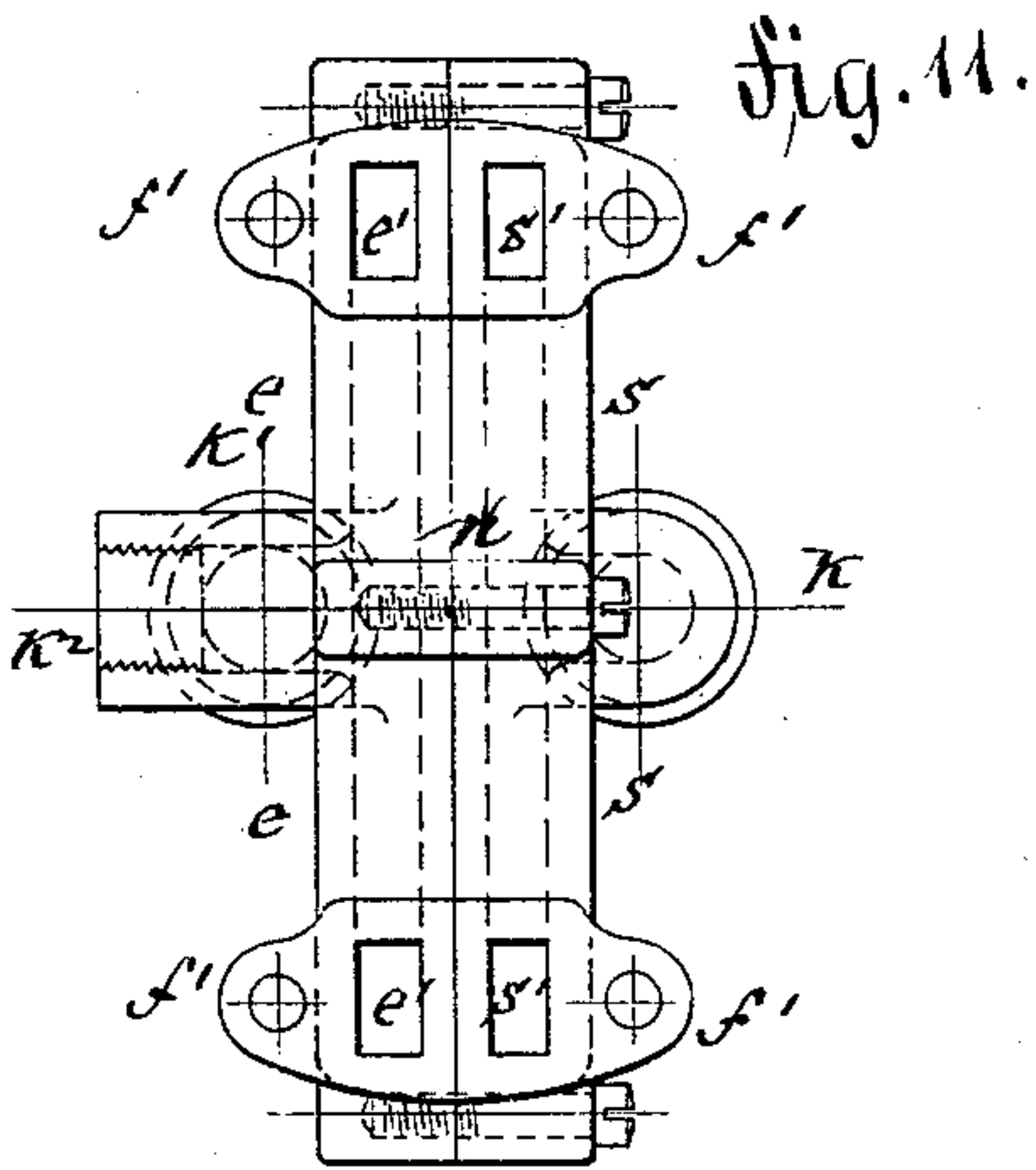
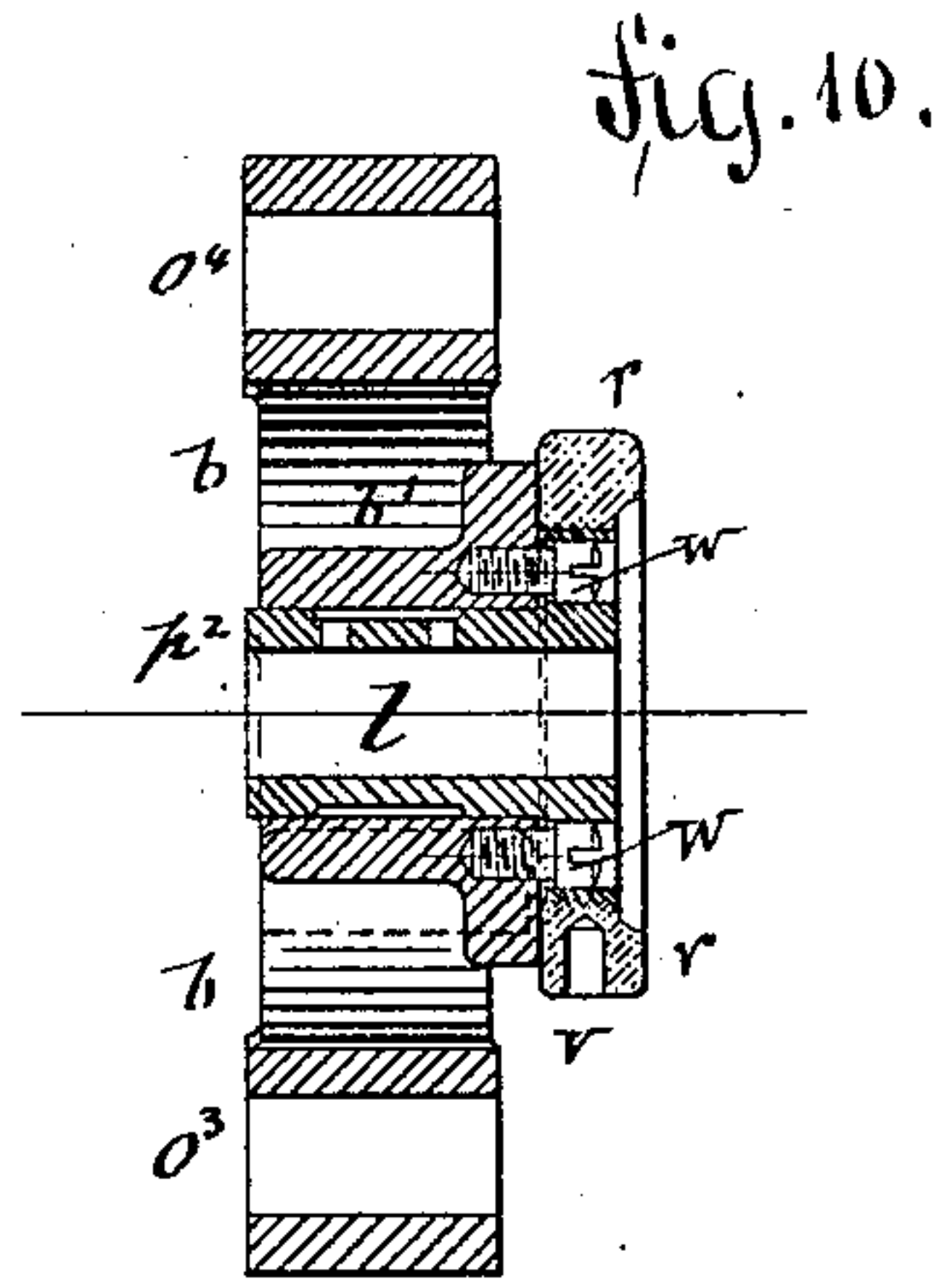
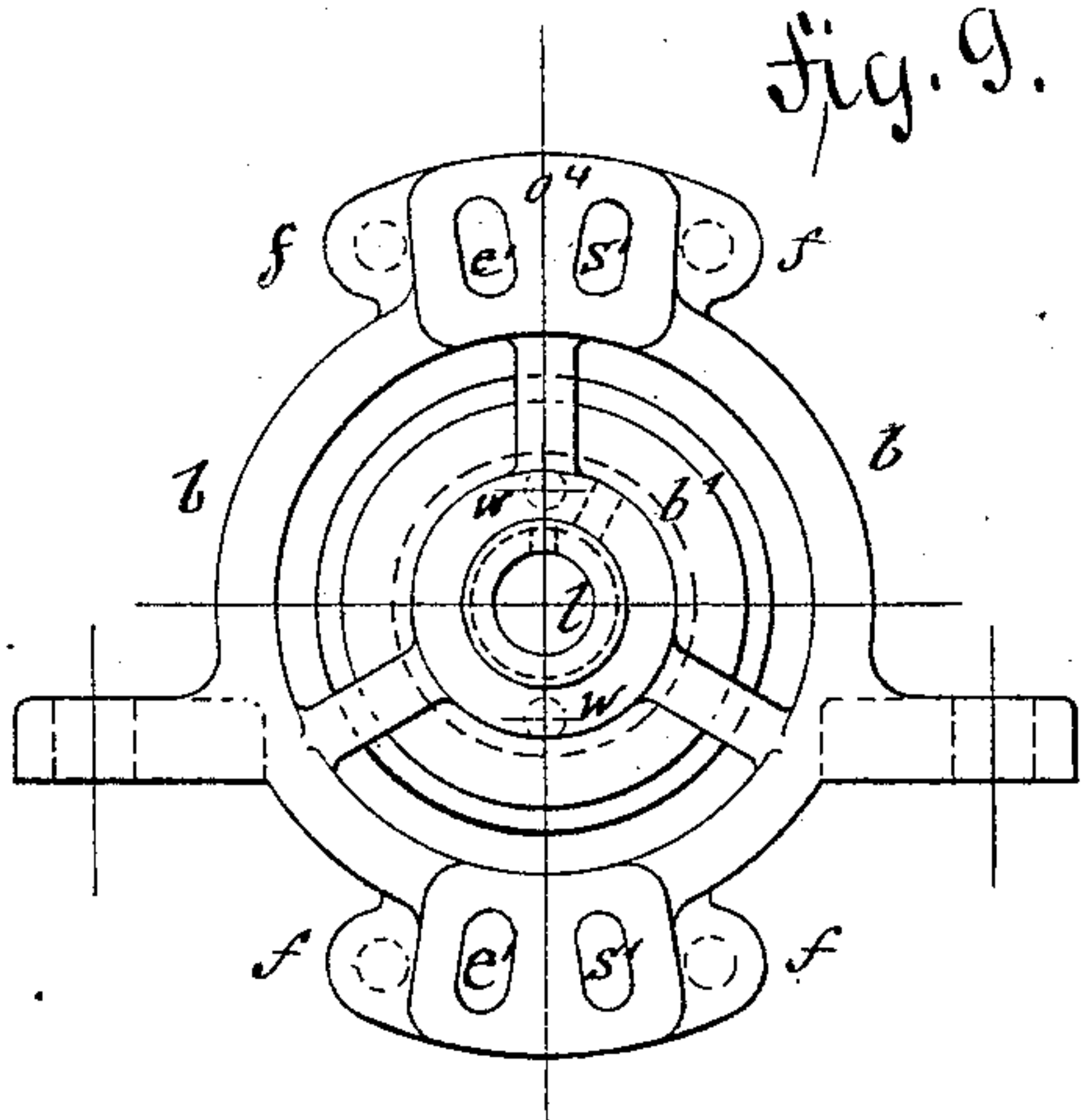
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M. ULRICH.

OSCILLATING STEAM ENGINE.

No. 338,890.

Patented Mar. 30, 1886.



WITNESSES:
Martin Petry.
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UNITED STATES PATENT OFFICE.

MAX ULRICH, OF EASTHAMPTON, MASSACHUSETTS.

OSCILLATING STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 338,890, dated March 30, 1886.

Application filed October 13, 1885. Serial No. 179,759. (No model.)

To all whom it may concern:

Be it known that I, MAX ULRICH, of Easthampton, in the county of Hampshire and State of Massachusetts, have invented certain
5 new and useful Improvements in Oscillating Steam-Engines, of which the following is a specification.

This invention relates to certain improvements in the oscillating steam-engine for which
10 Letters Patent of the United States were granted to me, No. 300,166, and dated June 10, 1884, whereby said steam-engine is made double-acting, and also adapted to be built on
15 a larger scale for use in cases where high-speed engines are required.

The invention consists of an oscillating steam-cylinder having steam-channels at both ends, said steam-cylinder being pivoted to suitable journal-bearings of a circular supporting-block and of a yoke resting on the bed-plate. Semicircular steam supply and exhaust pipes connect with the ports of the steam-channels of the cylinder.

The invention consists, further, of devices
25 for adjusting the pivots of the cylinder in their journal-bearings, and of other details of construction, which will be more fully described hereinafter, and finally pointed out in the claims.

30 In the accompanying drawings, Figures 1 and 2 represent a front and side elevation of my improved oscillating steam-engine. Figs. 3 and 4 represent a side and rear elevation of the oscillating steam-cylinder, its pivot-bearings, and the steam supply and exhaust pipes,
35 drawn on a larger scale. Figs. 5, 6, and 7 are respectively a rear elevation, a vertical longitudinal and a horizontal section on line $x\ x$, Fig. 6, of the oscillating steam-cylinder. Fig.
40 8 is a detail side view of the yoke for supporting one of the pivots of the cylinder. Figs. 9, 10, 11, 12, and 13 are details of the ring-shaped supporting-block for supporting the opposite pivot of the steam-cylinder and of the steam
45 supply and exhaust ports.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, a represents the steam-cylinder of my improved oscillating
50 steam-engine, and b a ring-shaped supporting-block, which is screwed to the bed-plate B of the engine, and which serves, in connection

with a yoke, c , that is also screwed to the bed-plate for supporting the pivots $q\ q'$ at the front and rear of the steam-cylinder a . The
55 main shaft S is supported in upright standards F F, which are attached to the bed-plate B and arched at their lower parts, so as to provide space for the supporting-block b , as well as for the steam supply and exhaust pipes. 60
Between the standards F F is arranged on the shaft S a fly-wheel, L, that is cast in one piece with a pulley, M. To one end of the main shaft S above the steam-cylinder is applied a crank-disk, G, to the wrist-pin of which is
65 pivoted the piston-rod i . To the opposite end of the main shaft S is applied a crank-disk, H, to which the connecting-rod of the feed-pump is pivoted.

The steam-cylinder a is provided with faces
70 $o' o^2$ and steam-channels $u\ u'$ at both ends of the same. It is further provided, intermediately between the faces $o' o^2$, with a socket, p , for the rear pivot, q' , said pivot being prevented from screwing loose by means of a trans-
75 verse key, p' . The outer end of the pivot q' is provided with a flanged nut, m , that is prevented from unscrewing by a split pin, m' . The pivot q' turns in a flanged journal-bearing, b' , at the center of a ring-shaped block, b ,
80 said bearing having a lining, l , which is fitted between the face of the socket p and the flange m^2 of the screw-nut m . The lining l is threaded at one end for a ring, r , which is screwed up against the face of the flanged bearing b' . The
85 screw-ring r serves for producing the tight adjustment of the faces of the steam-cylinder a with the face p^2 of the lining l . The lining l has on its threaded end two holes that are engaged by two screws, w , which are screwed
90 into the bearing b , whereby the lining is prevented from following the oscillating motion of the pivot q' , while it can be readily adjusted in longitudinal direction. The screw-heads rest in depressions of the threaded part of the
95 lining l , as shown in Fig. 10. The screw-ring r is provided at its circumference with several holes, v , as shown in Fig. 10, for putting in a pin and tightening up the faces.

The front pivot, q , is cast integral with the
100 steam-cylinder a and supported in a lining, l' , at the center of the yoke c , as shown in Figs. 3 and 6. The end of the pivot q is made conical, and bears against a plate, l^2 , which has a

corresponding depression, and which has the object to support the steam-cylinder in its centers, even if the lining l should be worn out. A set-screw, t , with a nut-lock, t' , adjusts the plate l^2 to the conical end of the pivot q , so as to keep it in close contact therewith.

The ring-shaped supporting-block b is provided at its upper and lower part with faces $o^3 o^4$, in which the ports $s' e'$ of the steam supply and exhaust pipes s and e are arranged, as shown in Fig. 9. The exhaust-ports $e' e'$ of the block b are equal in size with the ports of the steam-channels $u u'$ of the cylinder a , but larger than the steam-supply ports $s' s'$, by which the exhaust of the steam is facilitated and the wear of the ports considerably diminished. The supporting-block b is provided at both sides of the ports $s' e'$ with lugs f , to which the semicircular steam supply and exhaust pipes s and e are attached by lugs f' and screws. The steam-pipes s and e are connected sidewise to each other by screws $n n$, as shown in Figs. 11 and 12. To the middle portions of the pipes s and e are applied pipe-couplings $k k' k^2$ for the conducting-pipes. The cross-sections of the semi-circular pipes s and e and of the connecting-pipes $k k' k^2$ correspond to the area of the ports of the cylinder a , so that the steam is not retarded in its motion to and from the cylinder. The exhaust-steam can pass out either through the pipe k' or k^2 , according as the same is to be conducted to the draft-pipe of the boiler or directly to the atmosphere or to a condenser, as the case may be. At the bottom of the exhaust-pipe e is arranged an opening, n' , to which is screwed a drip-cup, for collecting the water of condensation and keeping the cylinder free from the same.

The faces of the steam-channels of the cylinder and of the ports of the supporting-block and the faces of the pivot-socket of the cylinder are turned off, so that they can be adjusted in close contact with each other, as shown in Fig. 3, so as to prevent the escape and loss of steam.

My improved steam-engine can be built on a larger scale, so as to be used for such purposes in which a high-speed engine is required. The novel features, as compared to the steam-engine heretofore patented to me, consists of the arrangement of the double supply and ex-

haust channels, whereby the engine is rendered double-acting, and in the pivoting of the steam-cylinder at the front and rear, whereby a greater degree of stability and a smoother motion is imparted to the same.

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

1. The combination of a laterally-oscillating steam-cylinder, a , having steam-channels $u u'$ and front and rear pivots, $q q'$, a yoke, c , for the front pivot, q , and a ring-shaped supporting-block for the rear pivot, q' , the yoke c and block b being provided with journal-bearings for said pivots, having interior linings, l and l' .

2. The combination of a laterally-oscillating steam-cylinder, a , having steam-channels u and u' and front and rear pivots, q and q' , a yoke, c , into which said pivot q on the side opposite said steam-channels extends and is supported, a ring-shaped supporting-block, b , through which said pivot q' extends, and means within said yoke for forcing the cylinder away from said yoke and against the faces of the steam-ports of the supporting-block.

3. The combination of a laterally-oscillating steam-cylinder, a , having steam-channels $u u'$ and front and rear pivots, $q q'$, the end of the pivot q being conical, a yoke, c , having a journal-bearing provided with interior lining, l' , end plate, l^2 , against which the conical end of said pivot is adapted to bear, and set-screw t in said yoke, for adjusting said plate l^2 and forcing the cylinder away from said yoke, a ring-shaped supporting-block, b , having a central journal-bearing, b' , and steam supply and exhaust pipes s' and e' .

4. The combination of a laterally-oscillating steam-cylinder, having steam-channels $u u'$ and front and rear pivots, $q q'$, a yoke, c , a ring-shaped supporting-block, b , having a central journal-bearing, b' , and steam supply and exhaust ports s' and e' at the upper and lower parts, and semicircular steam supply and exhaust pipes s and e , attached to the supporting-block, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

MAX ULRICH.

Witnesses:

HERMANN HUPFER,
JULIUS LAMPE.