

(No Model.)

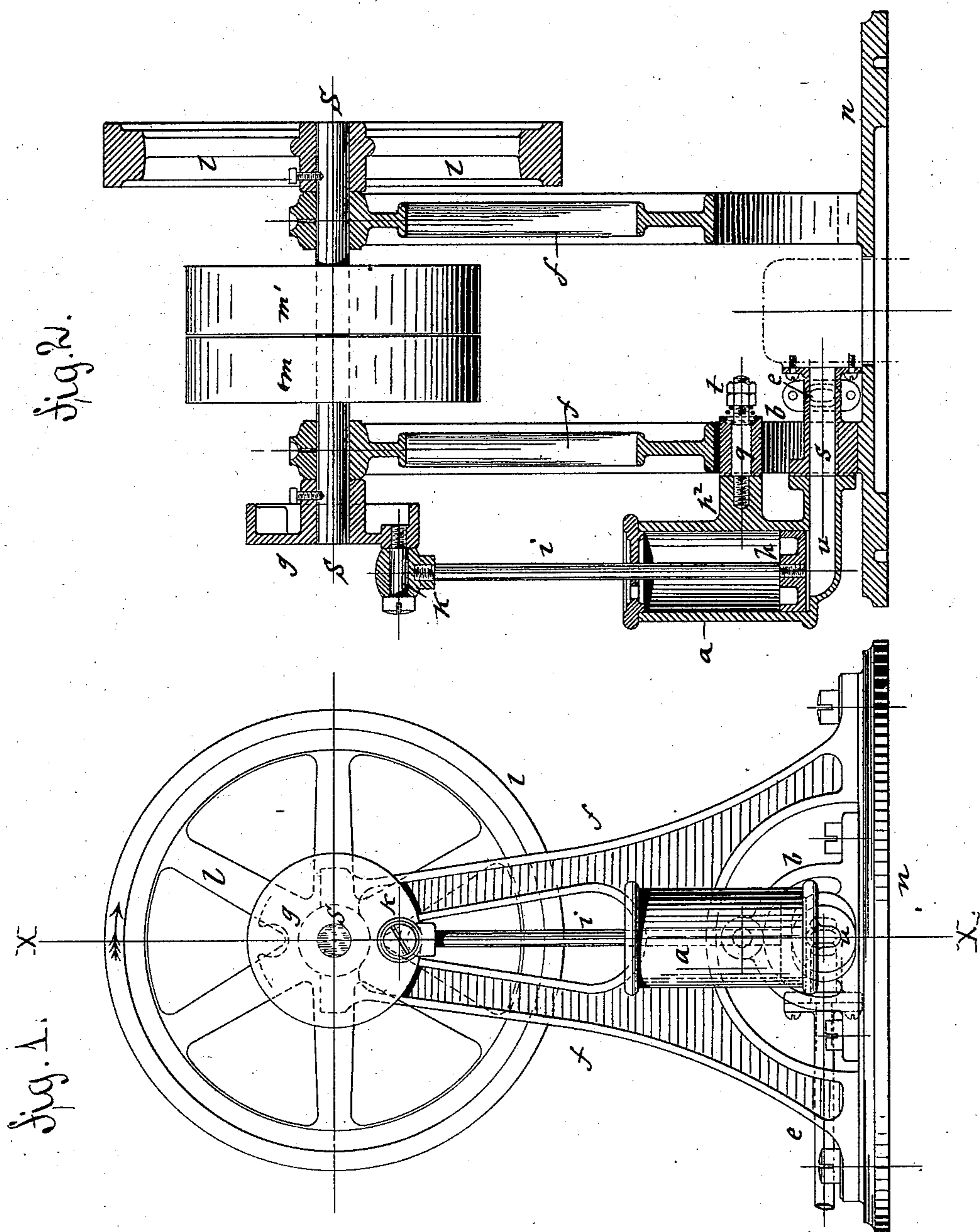
4 Sheets—Sheet 1.

M. ULRICH.

OSCILLATING STEAM ENGINE.

No. 300,166.

Patented June 10, 1884.



Witnesses:
J. H. Rosenbaum.
Martin Petry.

Inventor:
Max Ulrich
by Goepel & Raegenen
Attorneys.

(No Model.)

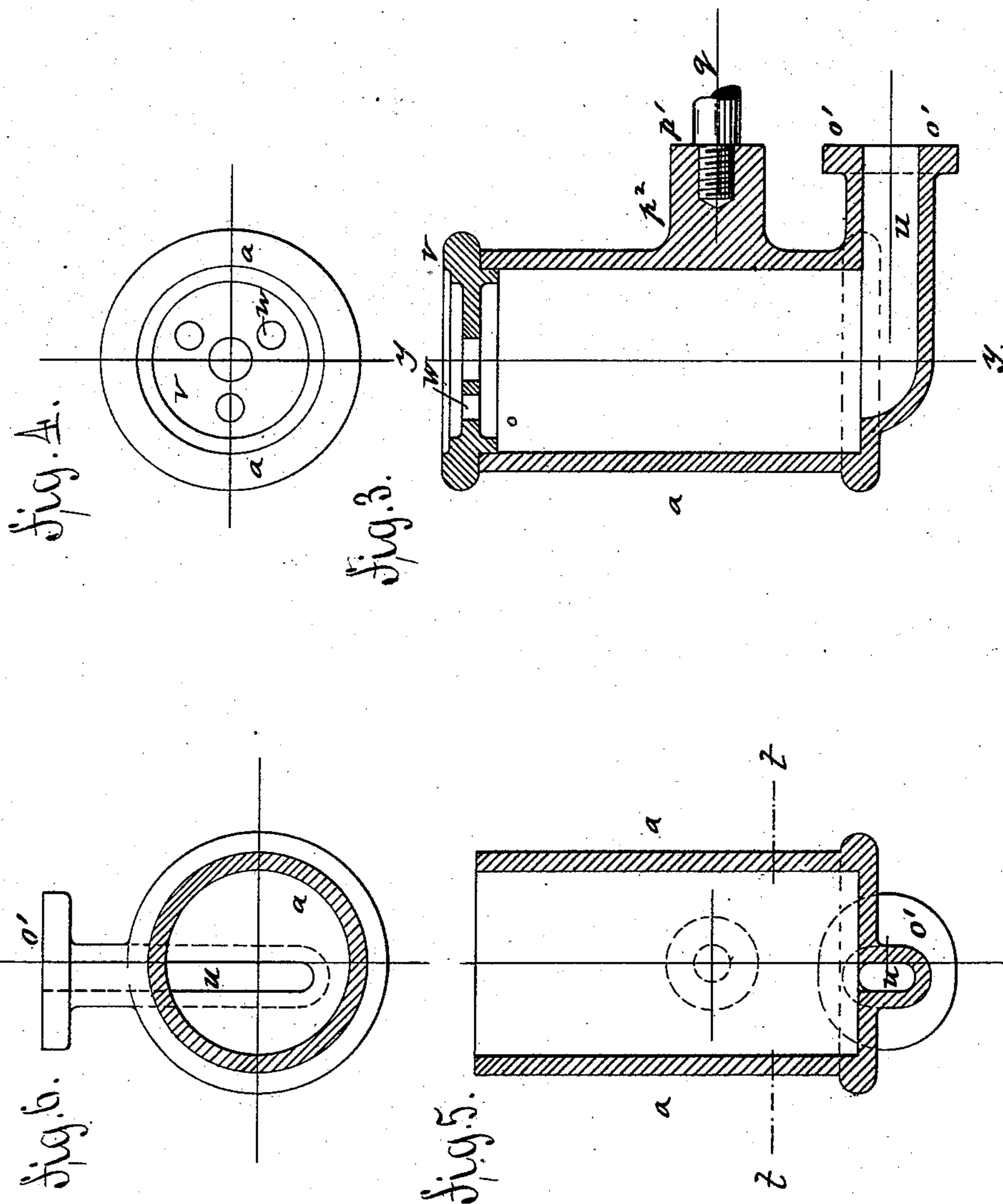
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4 Sheets—Sheet 3.

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fig. 8.

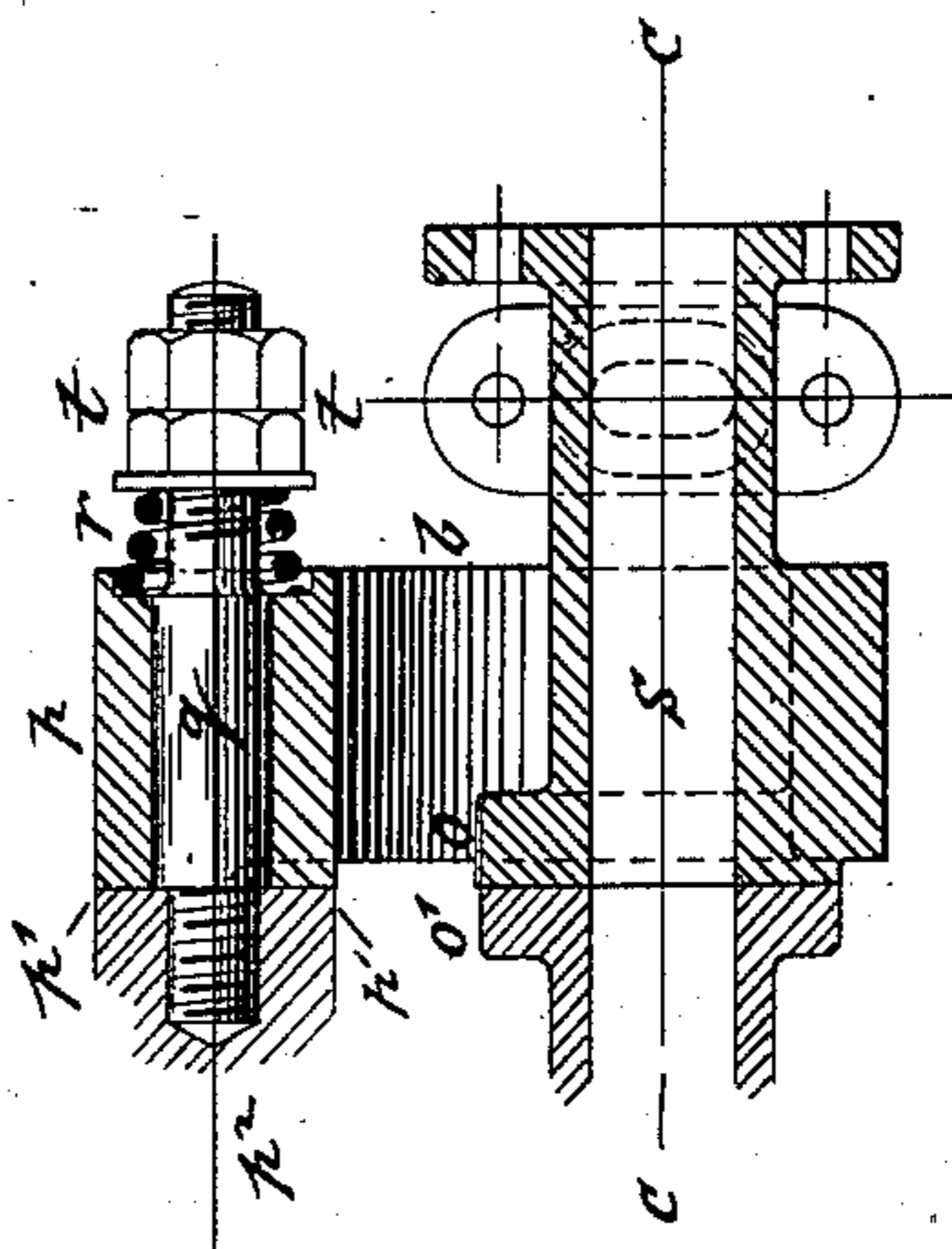


fig. 9.

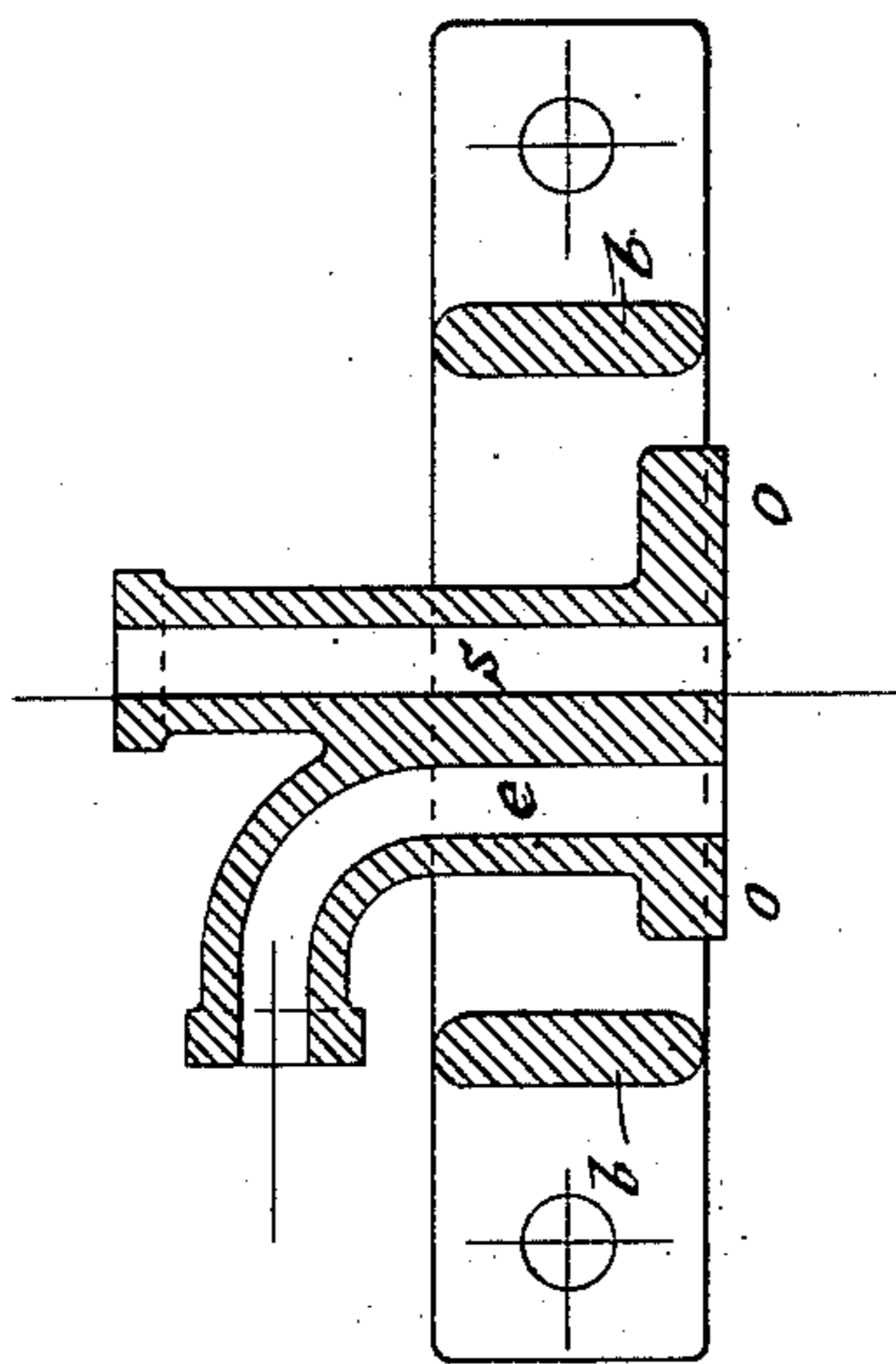
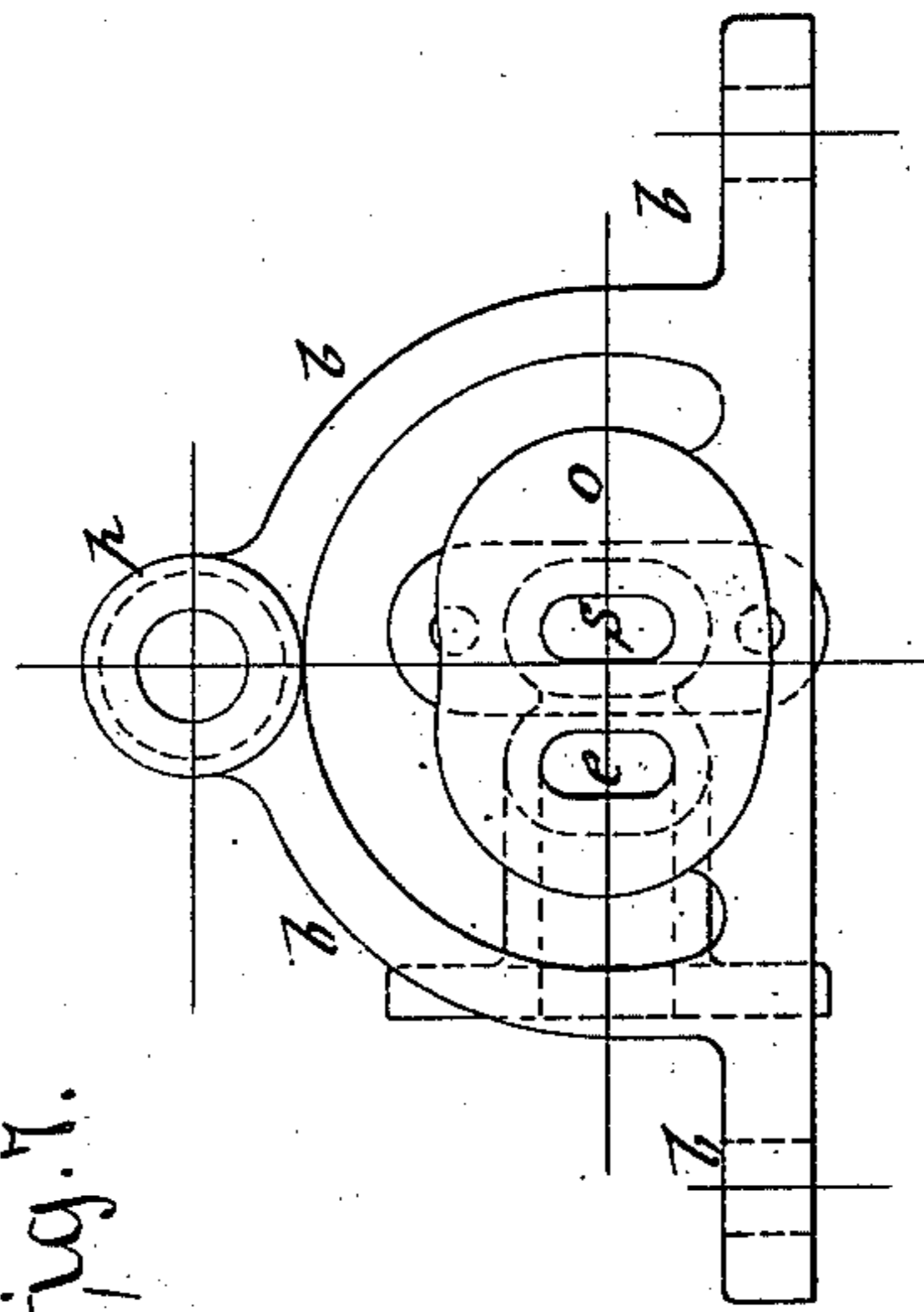


fig. 7.



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fig. 14.

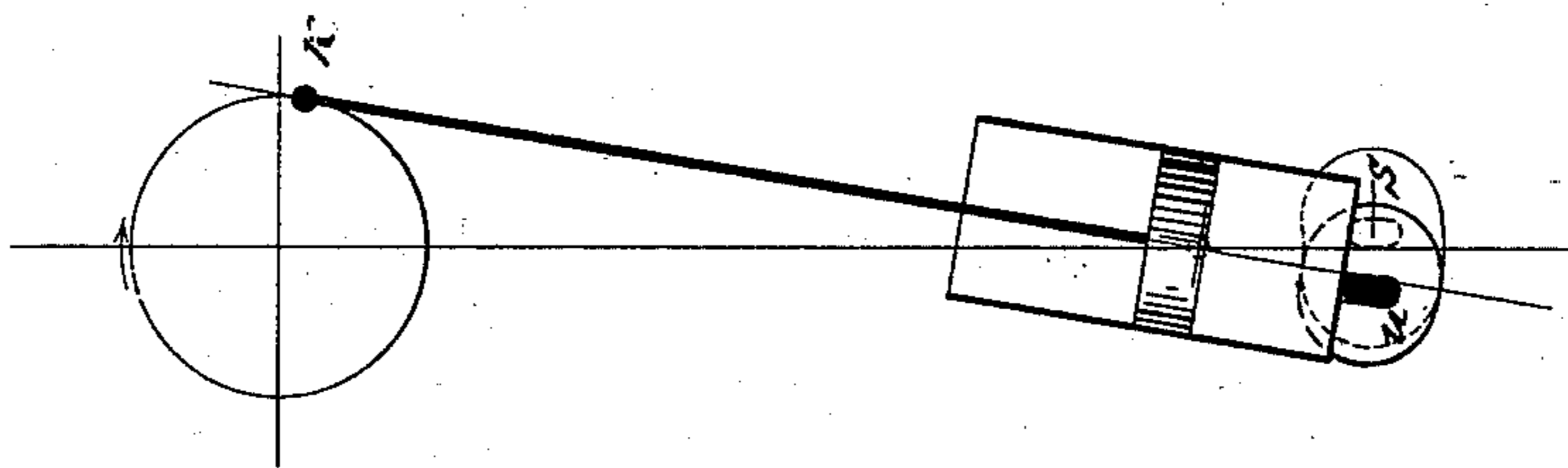


fig. 13.

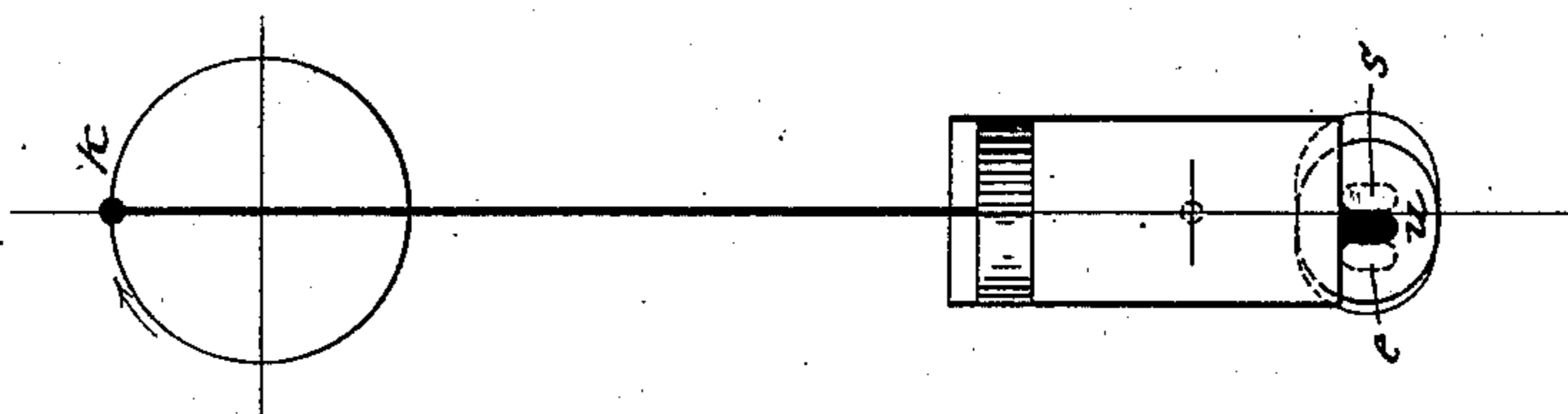


fig. 12.

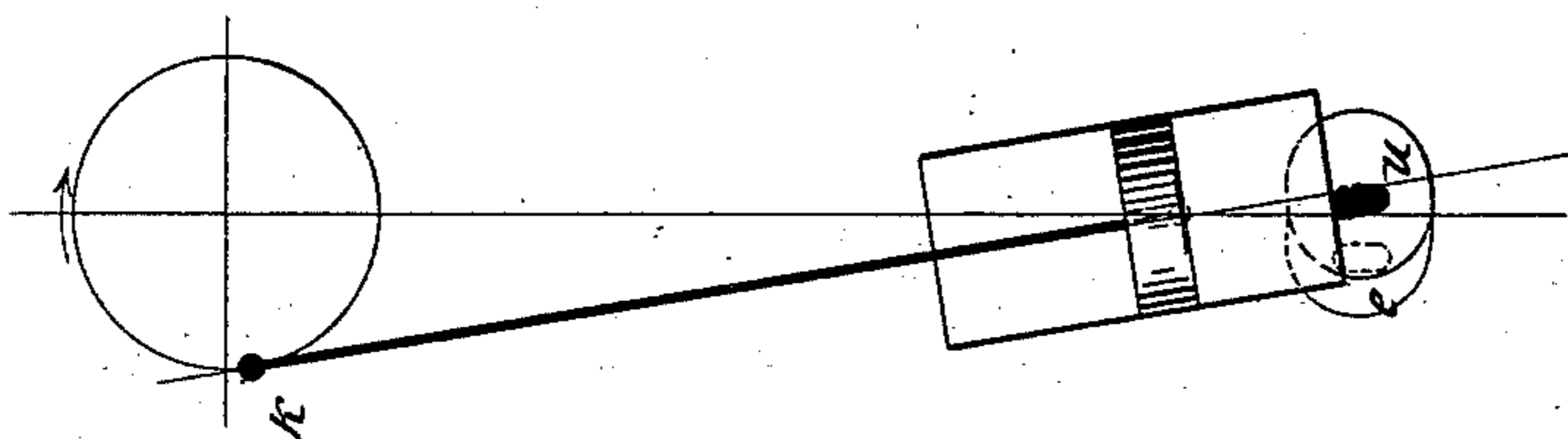


fig. 11.

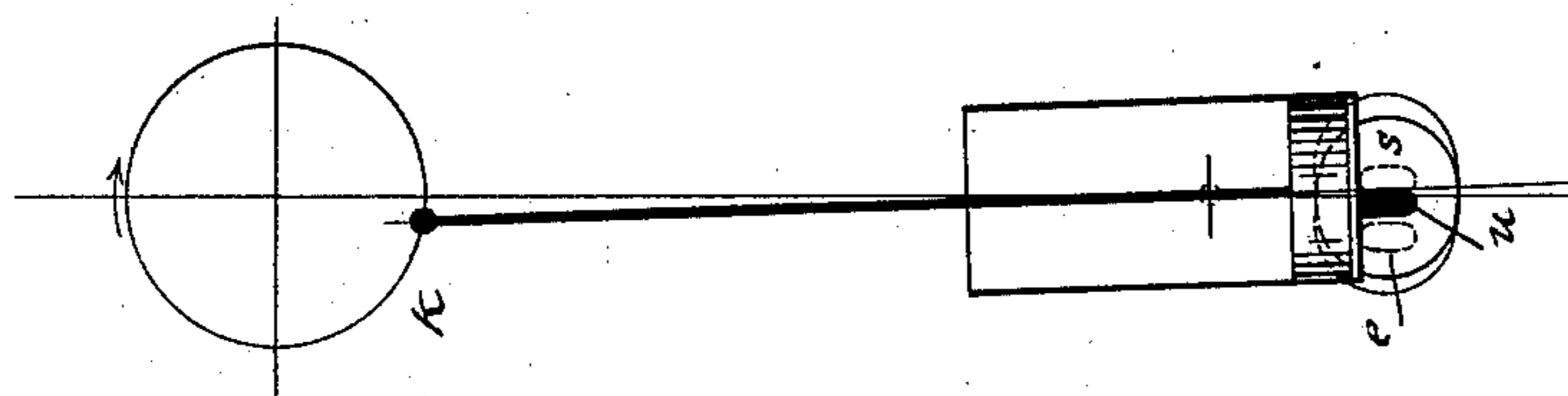
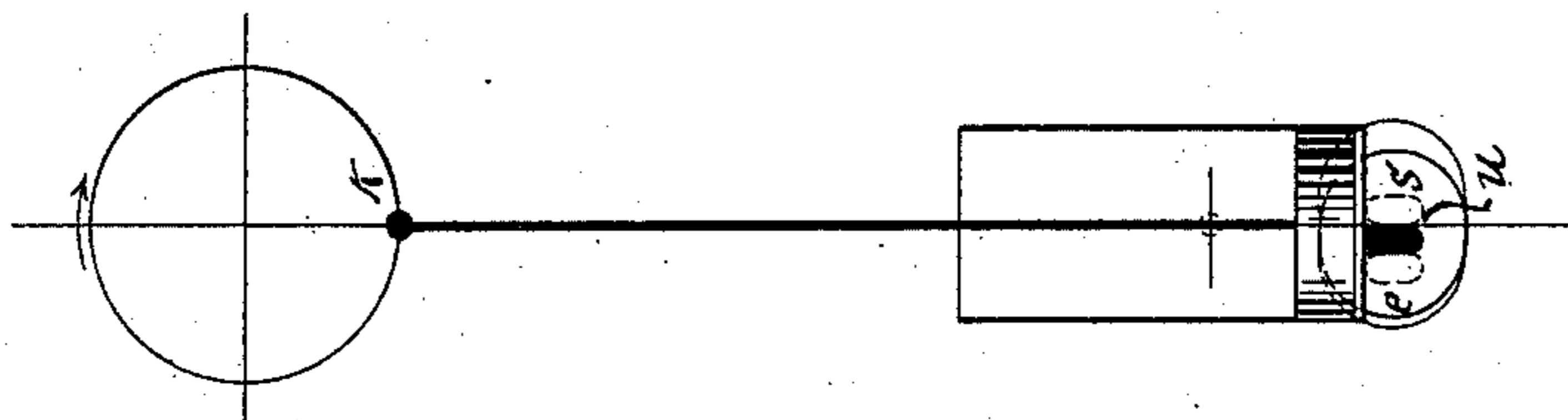


fig. 10.



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UNITED STATES PATENT OFFICE.

MAX ULRICH, OF HOLYOKE, MASSACHUSETTS.

OSCILLATING STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 300,166, dated June 10, 1884.

Application filed February 15, 1884. (No model.)

To all whom it may concern:

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

This invention has reference to an improved oscillating steam-engine of simple and reliable construction, which is specially designed for use as a motor of sewing-machines, lathes, pumps, for parlor-fountains, and similar devices; and the invention consists of a single-acting oscillating steam-cylinder having a steam-channel at the bottom, the port of which moves laterally across the ports of the steam supply and exhaust pipes, which are supported sidewise of each other on an arched block that supports also the pivot of the steam-cylinder. The face of the pivot-socket of the steam-cylinder is in line with the faces of the steam-ports.

In the accompanying drawings, Figure 1 represents a side elevation of my improved oscillating steam-engine. Fig. 2 is a vertical transverse section on line *x x*, Fig. 1. Fig. 3 is a detail vertical transverse section of the steam-cylinder; Fig. 4, a plan; Fig. 5, a section taken on a plane at right angles to the section shown in Fig. 3. Fig. 6 is a horizontal section on line *z z*, Fig. 5, of the oscillating steam-cylinder. Figs. 7, 8, and 9 are respectively an end elevation, a vertical transverse section, and a horizontal section on line *c c*, Fig. 8, of the supporting-block, the steam supply and exhaust pipes, and the pivot of the steam-cylinder; and Figs. 10, 11, 12, 13, and 14 are diagrams of the different positions of the steam-cylinder and piston during one full revolution of the driving-shaft.

Similar letters of reference indicate corresponding parts.

a in the drawings represents the steam-cylinder of my improved oscillating steam-engine, and *b* is an arched block, to the upper part of which the steam-cylinder is pivoted. The block *b* serves also to support the steam supply and exhaust pipes *s* and *e*. The driving-shaft *S* is supported in bearings at the upper part of vertical standards *f*, which are provided at the lower ends with arched portions, one of the standards *f* extending transversely across the fixed block *b*.

At one end of the driving-shaft *S* is a balance-wheel, *l*, and at the other end a crank-disk, *g*, which is connected by a crank-pin, *k*, to the piston-rod *i*, to the lower end of which is applied the piston *h*.

Intermediately between the standards *f f* the driving-shaft *S* is provided with fixed and loose pulleys *m m'*, that are mounted on shaft *S* in the usual manner.

The essential feature of my invention consists in the construction of the steam-cylinder, the supporting-block, and the peculiar arrangement of the steam supply and exhaust pipes on said block. The steam-cylinder *a* is provided at its bottom with a steam-channel, *u*, which is intermediately between the ports of the steam supply and exhaust ports when the steam-cylinder is in a vertical position. The cover *v* of the steam-cylinder *a* is provided with openings, so as to permit the escape of the air during the upward motion of the piston *h*. The face *o'* of the steam-channel *u* is of such a size that it laps over the face of the steam supply and exhaust pipes *s* and *e* when the steam-cylinder *a* arrives at the extreme outward position of its oscillation, the channel *u* registering then either with the steam-supply port or with the exhaust-port, as shown in Figs. 12 and 14. The steam supply and exhaust pipes *s* and *e* are clearly shown in horizontal section in Fig. 9, which also shows the ports of the same that are somewhat in front of the block *b*. The ports of both pipes *s* and *e* are of oval or elongated form, so that large openings are furnished for the admission and exhaust of the steam. The face *o'* of the bottom channel, *u*, of the steam-cylinder *a* moves close to the face *o* of the steam supply and exhaust pipes *s* and *e*.

Above the face *o*, and vertically in line therewith, is arranged the face *p'* of the bearing *p* at the top part of the block *b*, which bearing forms the support for the pivot *q* of the steam-cylinder *a*. The pivot *q* is screwed into a socket, *p²*, of the cylinder *a*, as shown in Figs. 3 and 8.

The faces *o* and *o'* of the steam-channels and the faces *p* and *p'* of the bearing *p* and socket *p²* are planed off, so that an intimate contact may be secured between them. They are always held in close contact with each other by a spiral spring, *r*, which is interposed between

a depression of the bearing p and a screw-nut, t , of the pivot q , as shown in Fig. 8.

In Figs. 10 to 14 five different positions of the steam-cylinder, piston, and crank-disk are shown during one rotation of the driving-shaft. If the crank-pin is in its lowermost position, as in Fig. 10, the port of the supply-channel u of the steam-cylinder is located between the steam admission and exhaust ports, so that no steam is admitted in this position until the balance-wheel carries the cylinder over this dead-point. The smallest force exerted in the direction of oscillation indicated by the arrow in Fig. 11 opens the steam-supply port and admits live steam into the channel u , so that the piston is lifted and a rotary motion imparted to the crank-disk and driving-shaft. The steam-cylinder continues its lateral motion until it arrives at the end of its oscillation, as shown in Fig. 12, in which position the port of the steam-channel u registers entirely with the steam-supply port. The cylinder u commences then its return oscillation, which causes a gradual diminution of the size of the steam-supply port until the port of the steam-channel u arrives intermediately between the supply and exhaust ports and shuts off the steam. In this position the crank-pin arrives at its uppermost position, as shown in Fig. 13. During the downward motion of the crank-pin and piston the port of the channel u begins to communicate and finally registers fully with the exhaust-port, as shown in Fig. 14, so that the steam is exhausted, as shown in Fig. 14. When the piston arrives at its lowest position, the steam-cylinder assumes the position shown in Fig. 10, the balance-wheel carrying it over the dead-point, so that live steam is admitted again. The alternate up-and-down motion of the piston and the oscillating motion of the steam-cylinder imparts a continuous rotary motion to the driving-shaft.

My improved oscillating steam-engine may

be constructed on a smaller or larger scale, provided proper care is taken that an intimate contact between the faces of the steam-channel of the cylinder and of the steam supply and exhaust ports and between the faces of the pivot-socket of the steam-cylinder and the bearing of the pivot is kept up.

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

1. The combination, with a laterally-oscillating steam-cylinder, a , having a bottom steam-channel, u , and a pivot, q , above the same, of an arched supporting-block, b , having steam supply and exhaust pipes s and e , and a bearing, p , for the pivot of the cylinder above the pipes s and e , substantially as set forth.

2. The combination of an arched supporting-block, b , having steam supply and exhaust pipes at the lower part and a bearing, p , at the top part, with a laterally-oscillating steam-cylinder, a , having a bottom steam-channel, u , and a pivot, q , above the same, said pivot being supported in the bearing p , and acted upon by a spiral spring, r , substantially as set forth.

3. The combination of an arched supporting-block, b , having steam admission and exhaust pipes s and e at the bottom part of the same and a bearing, p , at the top part, a laterally-oscillating steam-cylinder having a bottom steam-channel, u , and a spring-actuated pivot, q , the faces of the socket of the pivot and its bearings and the faces of the steam-channel u and the steam admission and exhaust pipes being arranged vertically in line with each other, substantially as and for the purpose 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:

PATRICK GALLAGHER,
I. LAMPE.