

No. 649,095.

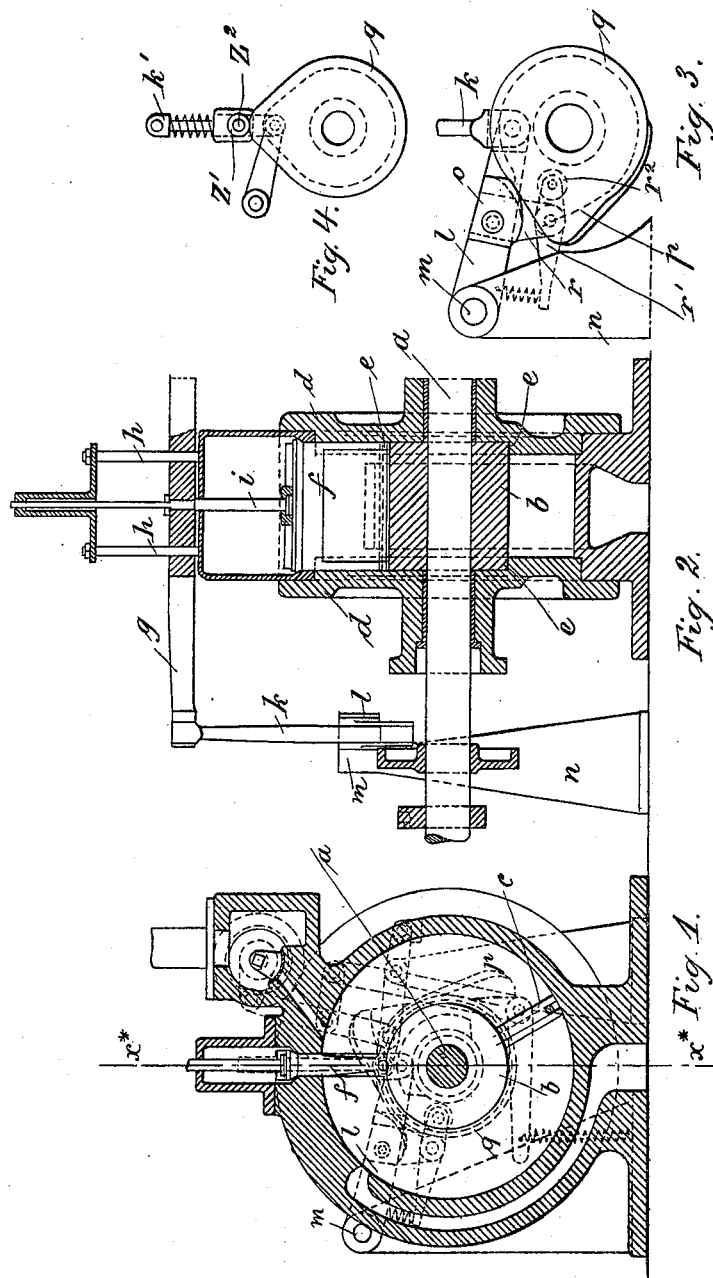
Patented May 8, 1900.

J. B. ZURA.
ROTARY MOTOR.

(Application filed June 30, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:
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per Heinrich Lade,
Attorney

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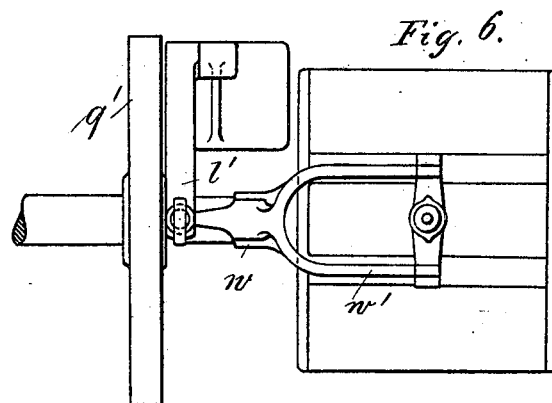
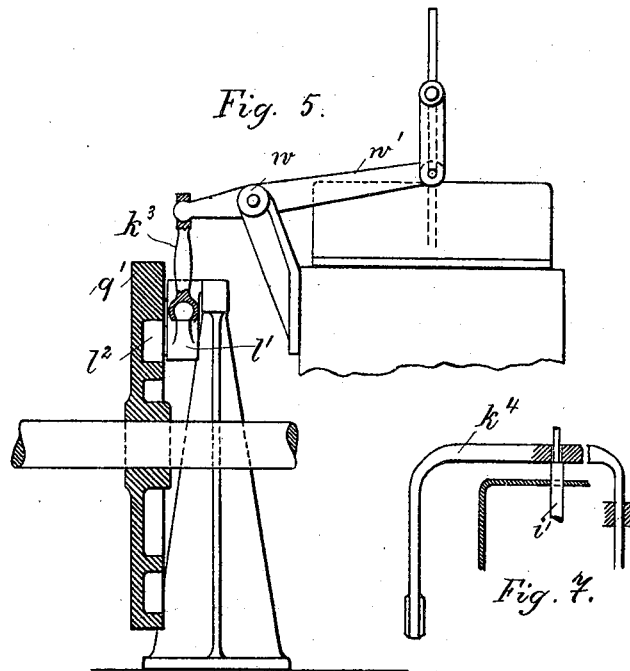
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3 Sheets—Sheet 2.



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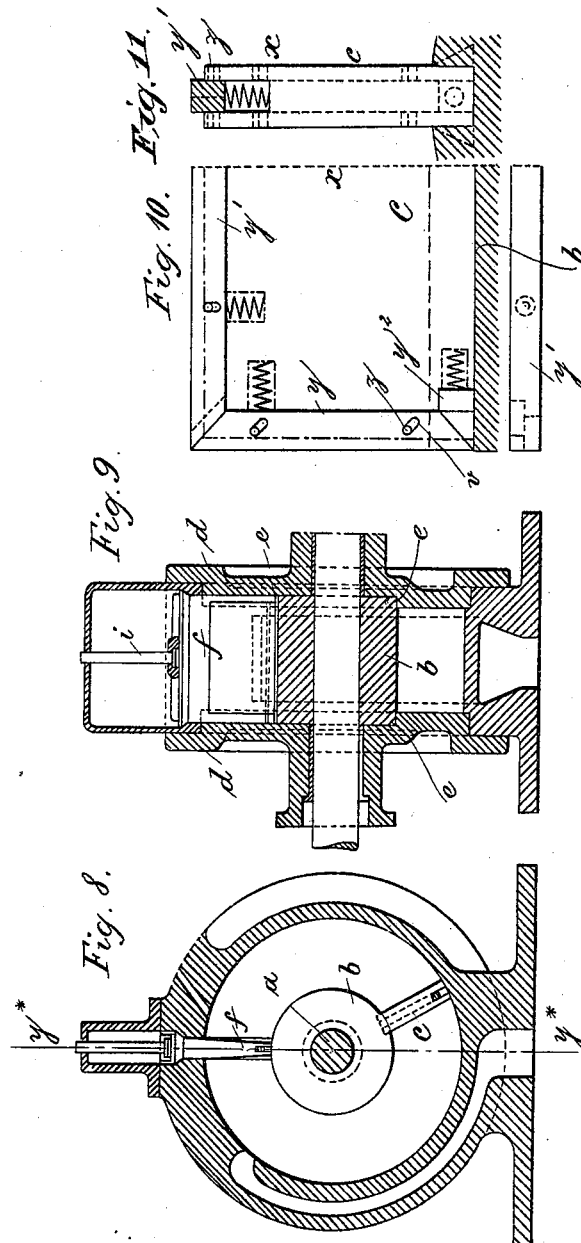
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

JOSEF BRUNO ZURA, OF BERLIN, GERMANY.

ROTARY MOTOR.

SPECIFICATION forming part of Letters Patent No. 649,095, dated May 8, 1900.

Application filed June 30, 1898. Serial No. 684,900. (No model.)

To all whom it may concern:

Be it known that I, JOSEF BRUNO ZURA, a subject of the King of Prussia, German Emperor, residing at the city of Berlin, Germany, have invented a new and useful Mechanism for Quickly Actuating the Obturator of Rotary Motors, (for which I have obtained a patent in France, No. 277,177, filed April 20, 1898; in Belgium, No. 135,202, filed April 20, 1898; in Great Britain, No. 8,004, filed April 14, 1898; in Luxemburg, No. 3,149, filed March 8, 1898; in Switzerland, No. 16,703, filed March 28, 1898, and in Hungary, No. 14,819, filed April 3, 1898,) of which the following is a specification.

My invention relates, first, to mechanism for quickly actuating the obturator or slide-valve of rotary motors, thereby reducing the loss of steam to a minimum, the obturator not being moved during the useful operation of the steam, but allowing the wing-piston to perform nearly its full working revolution and pass by the same, whereupon the obturator is quickly closed steam-tight with a noiseless movement.

The invention relates, secondly, to means for insuring the steam-tight operation of the obturator and of the wing-piston.

In the accompanying drawings, Figure 1 is a vertical section of a rotary motor with the invention applied thereto; Fig. 2, a section on line x^*x^* of Fig. 1 with parts similar to those shown on the left-hand side omitted on the right-hand side; Fig. 3, a detail side view, on an enlarged scale, of the cam mechanism by which the obturator is actuated; and Fig. 4, a modification of the same. Figs. 5 and 6 are respectively an elevation and a plan of a modified construction of the mechanism for actuating the obturator; Fig. 7, modified means for connecting the obturator with the rod through which it is actuated; Fig. 8, a section of the steam-cylinder of the motor with the obturator in edge view; Fig. 9, a section on line y^*y^* of Fig. 8. Figs. 10 and 11 refer to details of construction of the wing-piston.

The wing-piston u is constructed to take up wear. It comprises a plate x , keyed or wedged onto the nave b and provided in the middle of its edges with grooves for the reception of movable frame parts y y' y'' , furnished with oblique slots v , in which engage studs z , fixed

in the plate x , said frame parts being by the action of springs so moved in two directions against oblique bearing-surfaces that all the frame parts are correspondingly displaced toward the surface to be traveled over. The nave b is carried at its ends in recesses bored out in the cylinder-covers d , so as to rotate steam-tight therein. e are grooves formed in the cylinder-covers d for the reception of the side edges and guidance of the obturator or slide f .

g , Fig. 2, is a cross-bar guided in its upward-and-downward movement by the bolts h and having attached to it the obturator slide-rod i . The cross-bar is jointed at each end to one end of a connecting-rod k , the other end of which connects with a lever l , carried by an eye m of a standard n . The lever l is provided with an enlargement o , having a curved surface, against which the curved surface p of the cam q moves. This cam is fixed on the main shaft a . To the lever l is attached a downwardly-projecting arm r , carrying at its bottom end a lever r' , one end of which is connected with the lever l by a spring and the other end carries a roller which runs in an inner curve of the cam q . The roller r'' follows the inner curve (shown in Fig. 3 in dotted line) of the cam q , thereby holding in the downward travel the lever l against the outer curve of said cam, by which means the obturator is also held to its seat. In order to prevent shocks, the lever r' is connected with the lever l by a spring. Upon the rotation of the shaft a the cam q carried around with it, bears by its surface p , when this has arrived within reach of the enlargement o of the lever l , against this enlargement, so as to move this lever without noise or shock and the connecting-rods k , and with these the obturator f , up and down, and also so as to hold the latter in its proper position, the circular portion of the cam q keeping the obturator closed so long as the steam is operating and the curved portion p quickly lifting it to permit the passage past the same of the wing-piston and then closing it again by reason of the rapid fall of the lever l after the highest point of the curved surface p has passed it.

By means of the double set of working parts, one at each end of the cross-bar g , a regular

and exact motion of the obturator is obtained and the proper operation of the lever l is secured by the lever r' and roller r^2 .

The modified construction shown in Fig. 4 is particularly adapted for high-speed motors. The connecting-rod k' carries at its lower end a sleeve Z' , adjustable by means of a spring or screw. The sleeve Z' is provided with one or two rollers Z^2 , against which the cam q moves, and thus a controlled movement of the obturator is obtained. In the construction shown in Figs. 5 and 6 the obturator is operated from one side only of the motor. Here w is an eye-bracket fixed to the cylinder-cover and carrying an oscillating double lever w' , forked at one end, where it connects through links and a cross-bar with the obturator-rod, and at the other end is ball-jointed to the connecting-rod k^3 , which is moved from a cam-groove l^3 of the cam q' through lever l' .

In Fig. 7 the connection between the driving-cam and the obturator-rod i' is established by means of a frame k^4 .

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In rotary engines, a mechanism for quickly raising and lowering the obturator or cut-off slide direct, previous to and after the passage past the same of the wing-piston, and for holding the same to its seat during the operation of the steam, consisting in the combi-

nation of cams q fixed on the motor-shaft, said cams having a raised outer curved surface and an inner curved surface; of rods k which are connected with the obturator and jointed to levers l ; and of levers r' connected with the levers l by springs, said levers r' being furnished with rollers r^2 by which they bear against the inner curves of the cams q , substantially as described and shown.

2. In rotary engines, a mechanism for quickly raising and lowering the obturator or cut-off slide direct, previous to and after the passage past the same of the wing-piston, and for holding the same to its seat during the operation of the steam, consisting in the combination of cams q fixed on the motor-shaft, said cams having a raised outer curved surface and an inner curved surface; of rods k which are connected with the obturator and jointed to levers l ; and of levers r' connected with the levers l by springs, said levers r' being furnished with rollers r^2 by which they bear against the inner curves and with enlargements o on the levers l for rolling on the curves p of the cams q , substantially as described and shown.

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

JOSEF BRUNO ZURA.

Witnesses:

C. H. DAY,
HENRY HASPER.