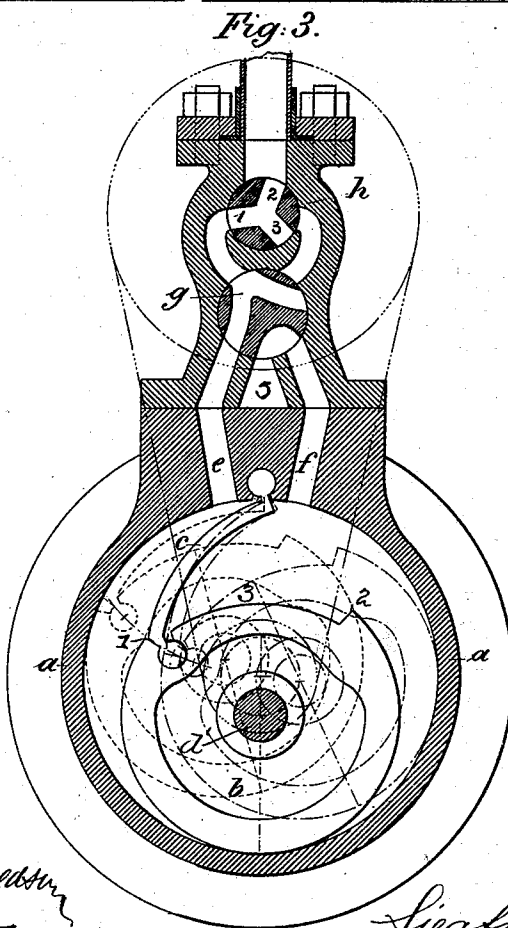
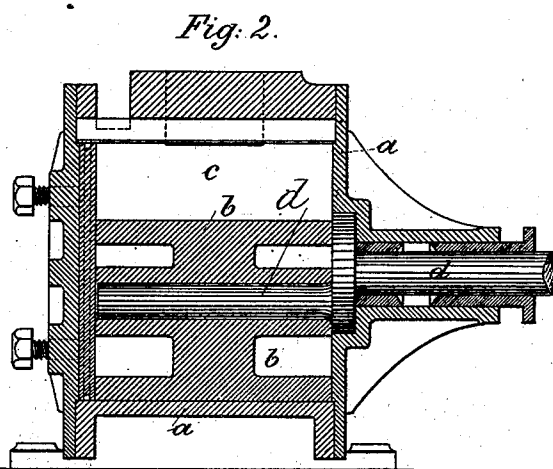
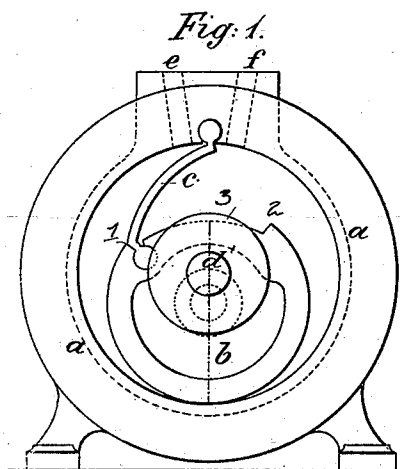


(No Model.)

S. MARCUS.
ROTARY ENGINE.

No. 503,611.

Patented Aug. 22, 1893.



Attest
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Inventor
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ATTYS.

UNITED STATES PATENT OFFICE.

SIEGFRIED MARCUS, OF VIENNA, AUSTRIA-HUNGARY.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 503,611, dated August 22, 1893.

Application filed October 29, 1892. Serial No. 450,405. (No model.)

To all whom it may concern:

Be it known that I, SIEGFRIED MARCUS, engineer, of Vienna, in the Province of Nether-Austria and Empire of Austria-Hungary, have invented certain new and useful Improvements in Rotary Engines, of which the following is a full and clear description.

This invention relates to improvements in rotary engines, which can be used to like advantage as pump, motor or fluid meter.

In contradistinction to similar constructions hitherto known, the piston which is arranged eccentrically to the casing is so hinged to the same by an oscillating closing plate that the piston can oscillate on its shaft, but cannot fully rotate around the same, so that the friction between piston, closing plate, and shaft or axle is reduced to a minimum.

In the accompanying drawings Figure 1 is an elevation of the engine with the cover removed. Fig. 2 is a transverse section and Fig. 3 a longitudinal section of the engine.

a is the casing, *b* the piston, *c* the hinged closing plate between the inlet and outlet, *d* a crank shaft with centrally arranged disk laying in a corresponding recess of the casing, and to which the axle around which the piston oscillates is eccentrically fixed.

If the aforescribed engine is to operate as motor, the liquid or elastic fluid admitted under pressure for driving the same, enters one of the inlet canals, for instance Fig. 3 and acts on the piston in such manner that the latter is driven in opposite direction. When the piston has reached the highest point in the casing *i. e.* between the two canals *e. f.* the outlet *f* is opened so that the fluid can flow through the canal *f*. This operation is repeated at each rotation of the piston around the central axis. It will be noticed that the periphery of the piston *b*, from the point 1 to 2 is struck from the center of the eccentric crank axle *d'*, while the periphery is flattened across the top of said piston as at 3 forming a curved depression ending in a shoulder at the point 2. The said depression provides a space for the curved plate *c*, to lie in between the piston and the inner wall of the cylinder when the piston reaches its highest point and it will be noticed that the plate is pivoted to the piston at one side of a line passing through the

centers of the piston and shaft so that as the piston oscillates the plate lies between the piston and the cylinder, that is at one point in the rotation of the piston. 55

From the symmetrical arrangement of the parts of the engine, it will be evident that the same operation will be effected in opposite direction, the fluid under pressure entering at *f* and escaping at *e*. The reversal of the movement can be effected by any suitable reversing device, as for instance by means of the cock *g*. When the engine is driven by elastic fluid the utilization of the expansion can be effected by one of the well known devices, or by the rotary cylinder *h* which allows the fluid to pass, throttles, or entirely cuts off the same. The symmetrical arrangement of the expansion device also permits the reversal of the movement in the same manner as before-mentioned. In order to reduce the friction of the expansion cylinder in its casing, the same is provided with three canals 1, 2, 3, whereby it is rendered possible to reduce the rotary speed of the cylinder to one third of the speed of the piston, which is attained by means of suitable gearing. 75

If the engine is to be used as suction and force pump, one of the canals must be connected to a suction and another to a pressure pipe or tube. If the main axle, and with this the piston is turned in one or the other direction, two spaces are formed, one of which will be increased and the other decreased in size by the continued movement of the piston, 85 whereby the cap or closing plate *c* serves as movable partition between the two spaces. It will be evident that the evacuation of the increasing space will suck the fluid to be pumped into this space, while the fluid in the next space 90 is forced out through the pressure pipe or tube. The parts of the engine being symmetrically arranged, the reversal of the driving direction can be readily effected.

Having now particularly described the nature of this invention and the manner in which the same is to be performed, I declare that what I claim, and wish to secure by Letters Patent, is— 95

1. In combination, the cylinder, the shaft, 100 the rotary piston arranged eccentrically to said shaft, the ports *e, f*, to the cylinder and the

plate *c*, positively and pivotally connected at its ends to the piston and cylinder respectively said plate being arranged to have lateral oscillatory movement, substantially as

5 described.

2. In combination, the cylinder, the shaft, the rotary piston arranged eccentrically to said shaft, and having a flattened portion 3, and the plate *c*, pivotally connected at its ends

10 to the piston and cylinder and arranged to have oscillatory movement, substantially as described.

3. In combination, the cylinder the shaft,

the rotary piston arranged eccentrically to the said shaft and the plate *c*, pivoted to the 15 piston to one side of a line drawn through the piston center and the shaft center said plate being pivoted also to the cylinder, substantially as described.

In witness whereof I hereunto set my hand 20 in presence of two witnesses.

SIEGFRIED MARCUS.

Witnesses:

W. B. MURPHY,
JOSEF TCHEBNEN.