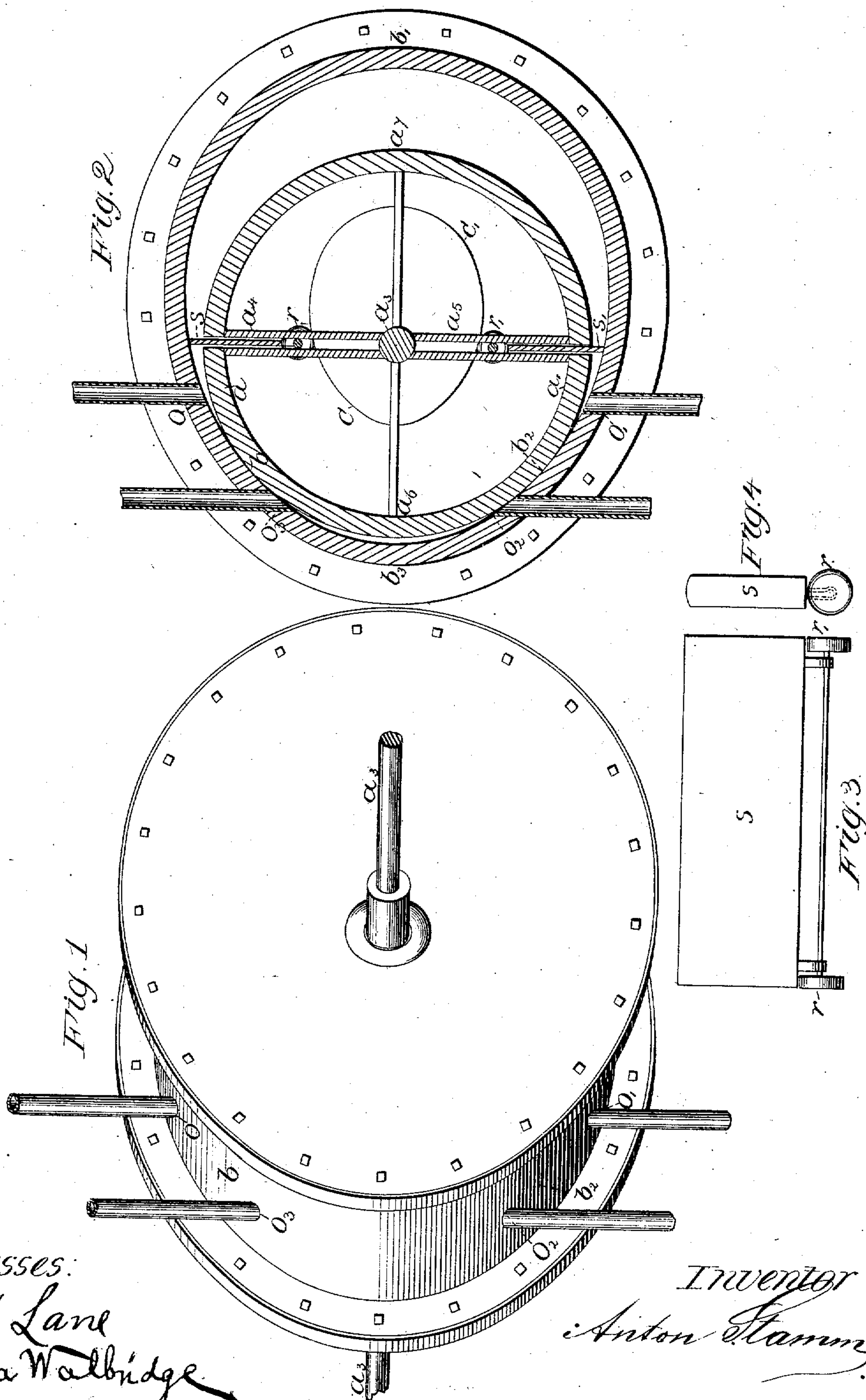


(No Model.)

A. STAMM.  
ROTARY ENGINE AND PUMP.

No. 246,428.

Patented Aug. 30, 1881.



Witnesses:

M. H. Lane  
Joshua Walbridge

Inventor  
Anton Stamm



# UNITED STATES PATENT OFFICE.

ANTON STAMM, OF LEADVILLE, COLORADO, ASSIGNOR TO THE STEAM MOTOR IMPROVEMENT COMPANY, OF SAME PLACE.

## ROTARY ENGINE AND PUMP.

SPECIFICATION forming part of Letters Patent No. 246,428, dated August 30, 1881.

Application filed November 23, 1880. (No model.)

*To all whom it may concern :*

Be it known that I, ANTON STAMM, of Leadville, county of Lake, and State of Colorado, have invented a new Combination and Improvement of a Rotary Engine and Pump, combined in one machine, of which the following is a description.

Heretofore the steam-engine and the pump which supplies the boiler with water have been separate machines, and the pump has been worked by the engine by means of belts, shafting, eccentrics, or by some other device.

The object of my invention is to provide a rotary engine so combined with a pump that both are within the same cylinder, and are worked by the same pistons, without connecting or intermediate machinery being required.

The invention consists in the combination of the following parts:

First, a hollow revolving cylinder of circular cross-section, and provided with a shaft in the center, from which shaft some spokes radiate, two opposite spokes of which form radial recesses.

Second, a hollow cylinder somewhat larger than the one above named, and being in the main of an oval cross-section. This cylinder surrounds the first-named revolving cylinder, but is in contact with it only in two places, whereas the portions between these two places of contact are bulging out farther than the opposite portions of the revolving cylinder.

Third, two sliding wings or slides, rectangular plates with rollers at their inner ends and packing at their sides and outer edges. These slides move in recesses made for this purpose in two opposite spokes of the inside cylinder, their side edges are in contact with the inner side of the two head-plates, and their outer edges are in contact with the inner surface of the outside cylinder.

Fourth, two cams. These are the central portions of the two head-plates projecting inwardly and forming cams of oval outlines, the outlines being parallel with and of the same shape as the cross-section of the outside cylinder, but of smaller size. These two cams act as guides for the rollers of the slides to run upon.

Fifth, the inlet and outlet openings for the

entrance and escape of the steam in the engine, and of the water in the pump.

The invention consists in the particular construction and arrangement of the two cylinders, the two sliding wings, and the two cams in the head-plates.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a perspective of a device embodying my invention. Fig. 2 is a vertical cross-section. Fig. 3 is a detail view of one of the slides, and Fig. 4 is a vertical longitudinal section of it.

$a a'$  is the hollow revolving cylinder. It has to be chased on its outside surface. Its cross-section forms a circle. In the center it is provided with the shaft  $a^3$ . From this shaft several spokes reach to the circumference. Two of these spokes,  $a^4$  and  $a^5$ , consist of two parallel plates each, which are smooth at their inner sides. These two parallel plates form radial recesses, in which the slides move in and out.

The outside stationary cylinder,  $b b^2$ , is somewhat larger than the inside revolving cylinder,  $a a'$ . It has to be chased on its inner surface. Its vertical cross-section shows the outlines of an oval figure. At the points  $b$  and  $b^2$  the two cylinders  $a a'$  and  $b b^2$  are in contact; but the portions of the cylinder  $b b^2$  which are between the two points named—i. e., the arcs  $b b' b^2$  and  $b b^3 b^2$ —are eccentric with regard to the cylinder  $a a'$ —viz., they are extending or bulging out farther than the opposite portions of the cylinder  $a a'$ . Thus the two cylinders form two inclosed chambers, the cross-sections of which are bounded by the arcs  $b b' b^2$  and  $a a^7 a'$ , and  $b b^3 b^2$  and  $a a^6 a'$ . The arc  $b b' b^2$  being the larger half of a circle which has a greater diameter than the cylinder  $a a'$ , and the arc  $b b^3 b^2$  being an arc of a circle which has a less diameter than the cylinder  $a a'$  has, it follows that the chamber  $b b' b^2 a a^7 a'$  corresponds with more than one-half of the revolving cylinder  $a a'$ , and consequently that one slide comes before the steam-port  $o$  (and under the influence of the steam-pressure there) a little before the opposite slide allows the steam to escape at the exhaust-port  $o'$ .



The cams  $c c'$  are the projecting central portions of the two head-plates, which stand forth inwardly, and thus form cams which are of oval outlines. Their peripheries are in all parts equidistant from the opposite portions of the periphery of the stationary cylinder  $b b^2$ . The peripheries of the cams are therefore parallel with the inner surface of the said cylinder  $b b^2$ , as indicated by a vertical cross-section of the same. The shape of the cams conforms, therefore, with the cross-section of the said cylinder, and is of oval outline. The size of the cam is, however, smaller than the cross-section alluded to. These two cams serve for the rollers  $r$  and  $r'$  (at the feet of the slides) to run upon. Thus they act as guides for them, and the opposite or outside edges of the slides are (in all positions) pressed up against the inner surface of the cylinder  $b b^2$ .

The sliding wings or slides  $s$  and  $s'$  are rectangular plates, smooth on both sides, and fitting accurately into the recesses of the two spokes  $a^4$  and  $a^5$ , which are provided for their reception. They reach from the circumferences of the cams  $c c'$  to the inner surface of the stationary cylinder  $b b^2$ , and from one head-plate of the latter cylinder to the opposite one. In order to run easily on the cams  $c c'$  the slides are provided with rollers at their inner edges, where they come into contact with the said cams. These rollers  $r$  and  $r'$  may be made of elastic vulcanized india-rubber, in order to secure close contact with the cylinder  $b b^2$  at the wearing-edges of the slides. There has also to be some packing fastened to the edges which are in contact with the inside of the cylinder  $b b^2$  and of the two head-plates, in order to make them steam and water tight.

The opening  $o$  is for the inlet of the steam or other power, and the opening  $o'$  is for the escape of the steam after having done its work. When the engine is to be reversed, then the power is admitted by the opening  $o'$  and ex-

hausted by the opening  $o$ . The openings  $o^2$  and  $o^3$  are for the inlet and outlet of the water or other liquid which is to be pumped. The slides force the liquid out at  $o^3$ . The apparatus acts as a force-pump.

The operation of this device is as follows: When steam is being admitted by the port  $o$  it presses on the slide  $s$ , when the latter comes in front of it, and moves the slide forward toward the right and downward on the right side until it has passed the exhaust-port  $o'$ , by which the steam escapes; but before this takes place the other slide,  $s'$ , has already cleared the steam-port  $o$ , and has arrived in front of the opening. The incoming steam therefore acts on each slide (and presses it forward) before the opposite slide allows the spent steam to exhaust by the opening  $o'$ , or vice versa in case the engine is to be reversed. The slides in being moved forward and around take the cylinder  $a a'$  along with them, acting as levers for this purpose. Thus a continuous rotation of the cylinder  $a a'$ , together with its shaft  $a^3$ , is secured. The slides  $s$  and  $s'$  in passing the inlet-opening  $o^2$ , which admits the water or other liquid to be pumped, shove the liquid contained in the water-chamber forward from right to left, and force it out by the outlet-opening  $o^3$ , thus acting in the capacity of a force-pump, emptying the chamber twice during every revolution of the cylinder  $a a'$ .

What I claim as my invention is this:

The combination of the revolving cylinder  $a a'$  with the stationary cylinder  $b b^2$ , the two cams  $c c'$ , the slides  $s$  and  $s'$ , and the inlet and outlet openings  $o$  and  $o'$  for the steam, and  $o^2$  and  $o^3$  for the water or other liquid to be pumped, all substantially as described, and for the purposes specified.

ANTON STAMM.

Witnesses:

JOSHUA WALBRIDGE,  
M. H. LANE.