

No. 639,644.

Patented Dec. 19, 1899.

H. A. ZINN.
STEAM ENGINE.

(Application filed Mar. 13, 1899.)

(No Model.)

2 Sheets—Sheet 1.

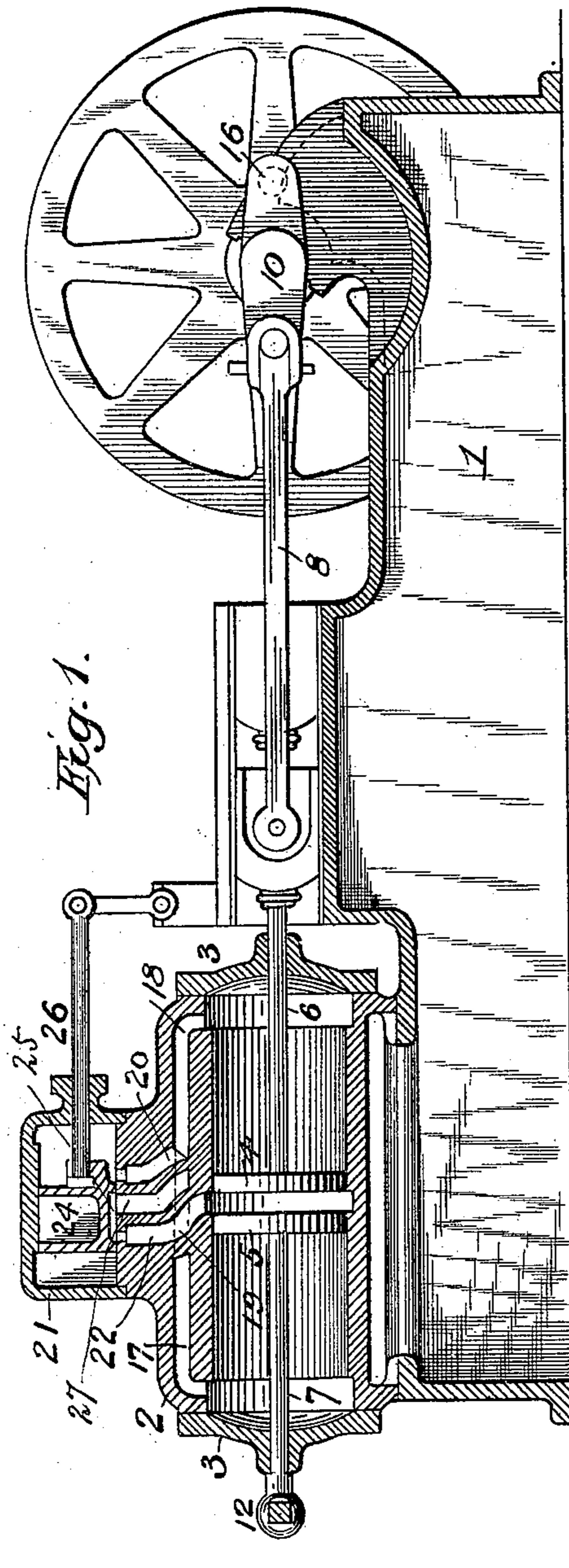


Fig. 1.

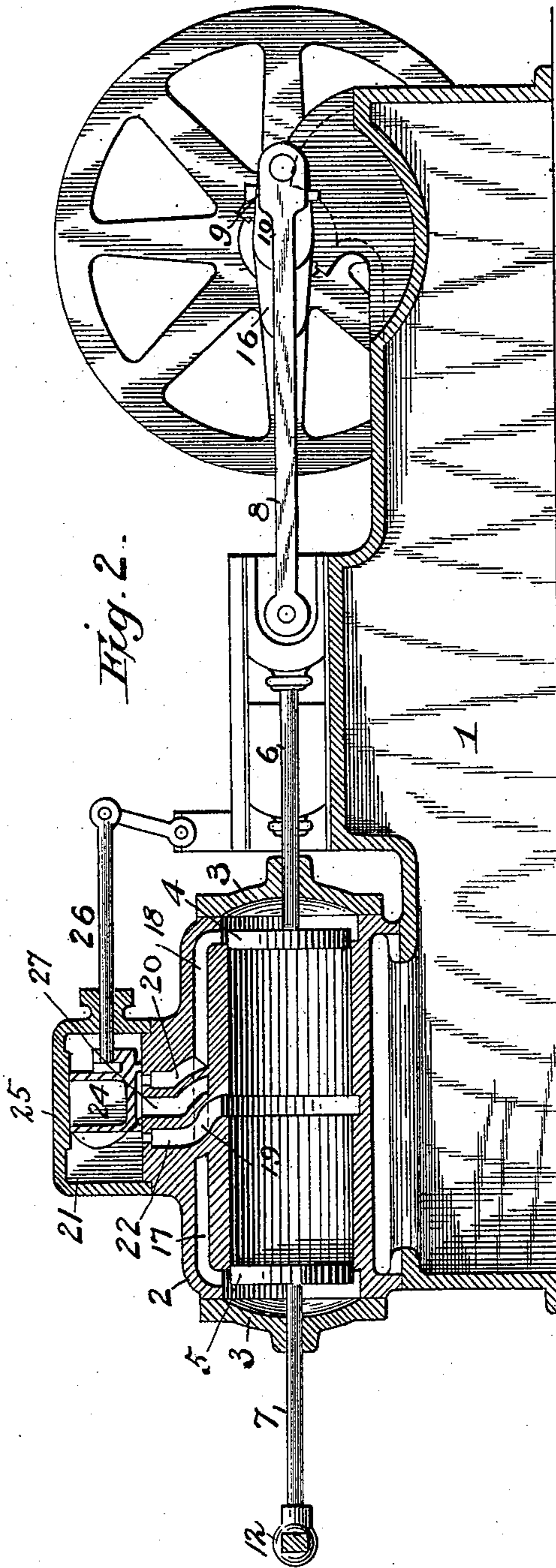


Fig. 2.

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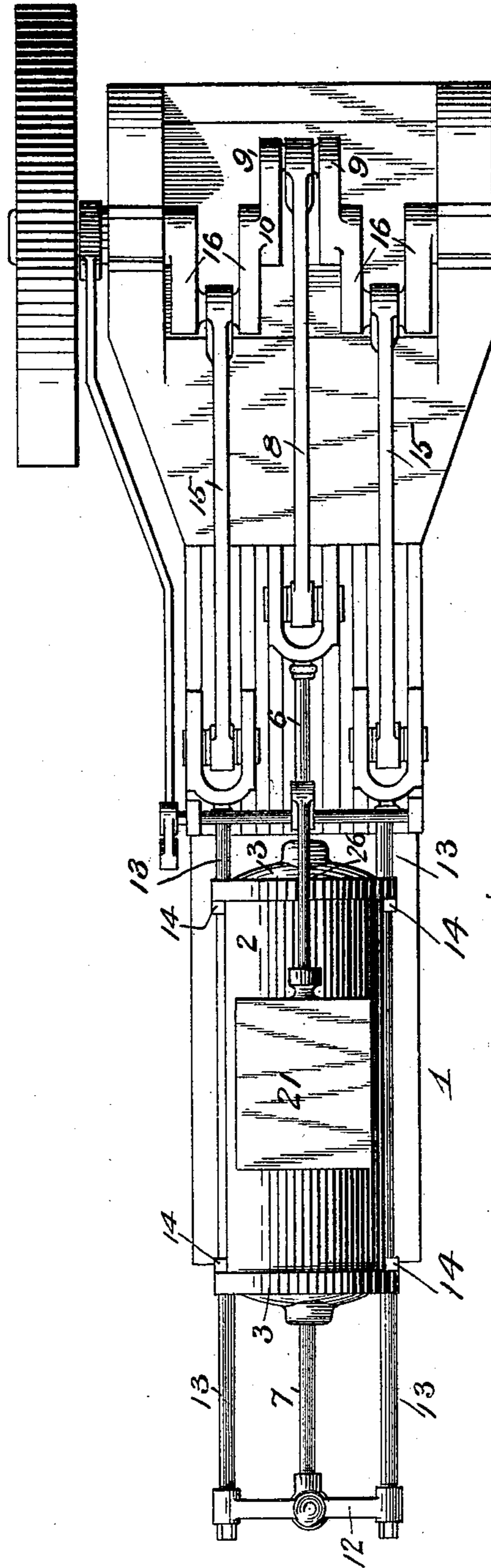


Fig. 3

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UNITED STATES PATENT OFFICE.

HARLEY A. ZINN, OF OIL CITY, PENNSYLVANIA, ASSIGNOR OF ONE-HALF
TO WILLIAM ALLISON, OF SHAMOKIN, PENNSYLVANIA.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 639,644, dated December 19, 1899.

Application filed March 13, 1899. Serial No. 708,928. (No model.)

To all whom it may concern:

Be it known that I, HARLEY A. ZINN, a citizen of the United States, residing at Oil City, in the county of Venango and State of Pennsylvania, have invented new and useful Improvements in Steam-Engines, of which the following is a specification.

My invention relates to steam and other similar engines; and its object is to provide an improved construction of the same in which two reciprocating pistons are employed which operate in different directions in the cylinder—that is to say, during the outward stroke the pistons move away from each other, while during the inward stroke they move toward each other, steam being alternately admitted to the cylinder at the center and ends thereof, and also alternately exhausted at the ends and center to produce said outward and inward strokes.

The invention consists in the novel construction and combination of parts herein-after fully described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of a steam-engine constructed in accordance with my invention, the pistons being shown at the commencement of their outward stroke. Fig. 2 is a similar view, the pistons being shown at the commencement of their inward stroke. Fig. 3 is a plan view.

In the said drawings the reference-numeral 1 designates the bed of the engine, and 2 the cylinder, provided with the usual heads 3. Located in said cylinder are two oppositely-operating pistons 4 and 5, provided with piston-rods 6 and 7, which pass through the cylinder-heads. One of said pistons 6 is provided with a pitman 8, which is connected with the crank 9 of a driving-shaft 10, as usual. The other piston-rod 7 is connected with a cross-head 12, provided with connecting-rods 13, which pass through guide-eyes 14, and at their front ends are provided with pitmen 15, which are connected with cranks 16 of the driving-shaft, which cranks while in alinement with the crank 9 extend in opposite directions therefrom. Formed in said cylinder are two steam-passages 17 and 18, which extend from near the center of the cylinder to near the ends thereof, and the inner

ends are connected by a curved passage 19, so that, in effect, said passages are continuous. This curved passage is shown in dotted lines in the drawings. Said passage 17 is connected by a passage 20 with a steam-chest 21, which may be of any ordinary or suitable construction. The numeral 22 designates a passage also communicating with the steam-chest and with the cylinder at the center of the latter. The numeral 27 designates the exhaust-passage. Located in said steam-chest is a slide-valve 24, provided with a cavity 25 in its under side. Connected with said valve is a valve-rod 26, passing through one end of the chest and is operated by any ordinary or suitable means—such, for instance, as an eccentric (not shown) for reciprocating the same.

The operation is as follows: The parts being in the position shown in Fig. 2, steam from the valve-chest will enter passage 22 and from thence will pass to the center of the cylinder, forcing the pistons outward or away from each other, the exhaust taking place through the passages 17, 18, 19, and 20 to the cavity 25 and from thence to the exhaust-passage 26. Upon the return stroke passages 20, 18, 19, and 17 will become the inlet-passages, the steam entering the cylinder at the ends and forcing the pistons inward or toward each other. The exhaust will now be from the center of the cylinder through cavity 25 to exhaust-passage 27. By reason of the crank pointing in a diametrically opposite direction to the cranks 16, as the said pistons operate simultaneously in opposite direction a continuous rotary movement is given to the driving-shaft.

Some of the advantages gained by my invention are that the engine will run faster than the ordinary single-piston engines, will require less metal in its construction, and the steam having only about half the distance to travel there will be considerably less condensation of the same, and consequently a saving in the fuel consumed.

My invention is adapted for all kinds of reciprocating engines, no matter whether the motive power be steam, compressed air, or other fluid.

Having thus fully described my invention, what I claim is—

In a steam or other engine, the combination with the steam-chest, the cylinder, the slide-valve located in said steam-chest and formed with a cavity 25 in its under side, and said
5 cylinder formed with two passages 17 and 18, a passage 19 connecting the same, a passage 20 communicating with passage 18 and with the steam-chest, a passage 22, communicating with the cylinder at the center thereof
10 and with the steam-chest and an exhaust-passage 27, of the oppositely-operating pistons located in said cylinder, the pitmen connected with one of said pistons, the driving shaft

and crank, the cross-head connected with the other piston, the forwardly-extending rods 15 connected therewith, the pitmen connected with said rods, and the oppositely-extending cranks with which said pitmen are connected, substantially as described.

In testimony whereof I have hereunto set 20 my hand in presence of two subscribing witnesses.

HARLEY A. ZINN.

Witnesses:

MYRON E. HOOVER,
J. J. ZINN.