

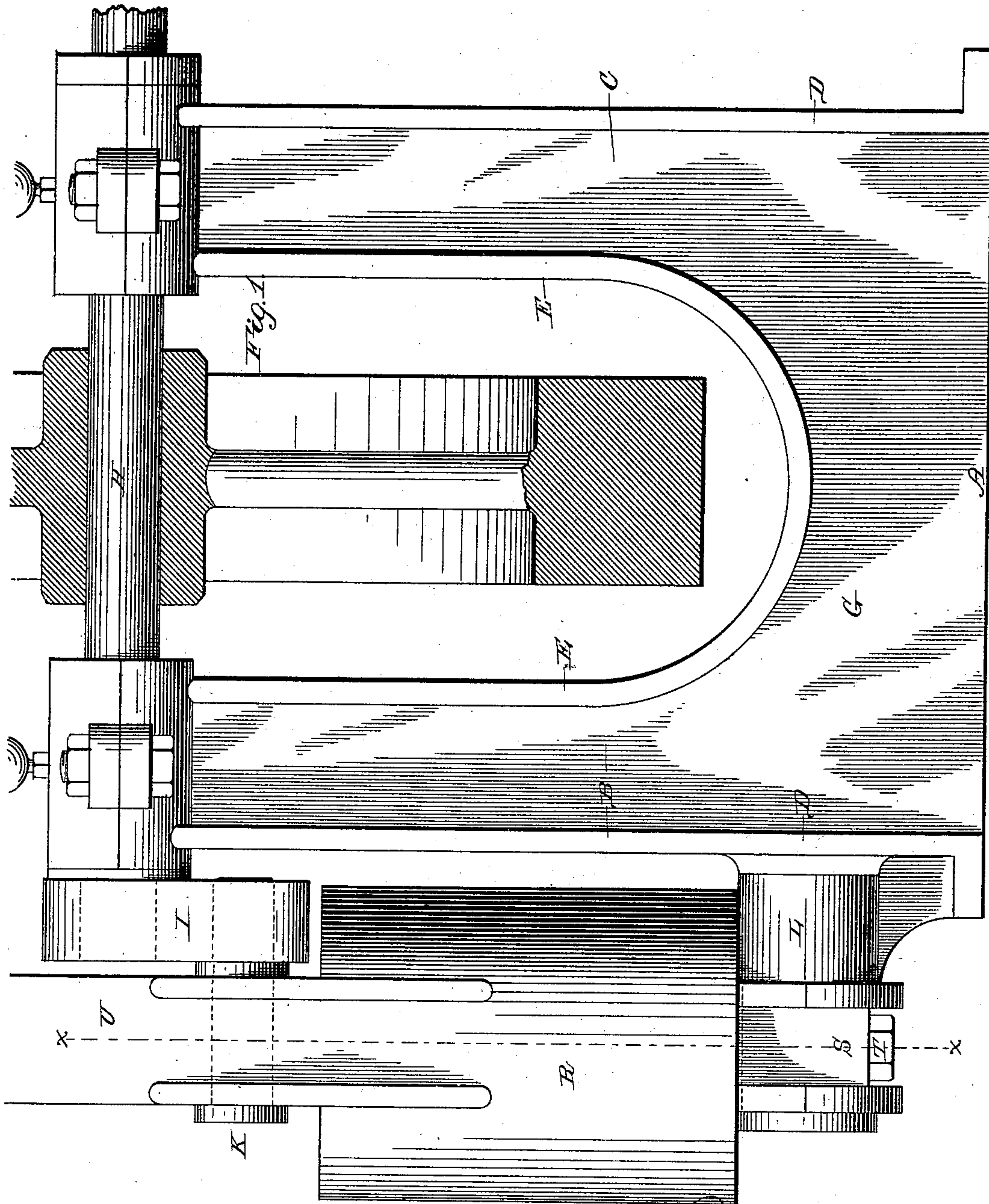
(No Model.)

2 Sheets—Sheet 1.

J. CLARK.  
STEAM ENGINE.

No. 316,332.

Patented Apr. 21, 1885.



WITNESSES

*J. W. Garner*  
*E. G. Diggers*

*James Clark*  
INVENTOR

by *C. A. Snow & Co.*

Attorneys

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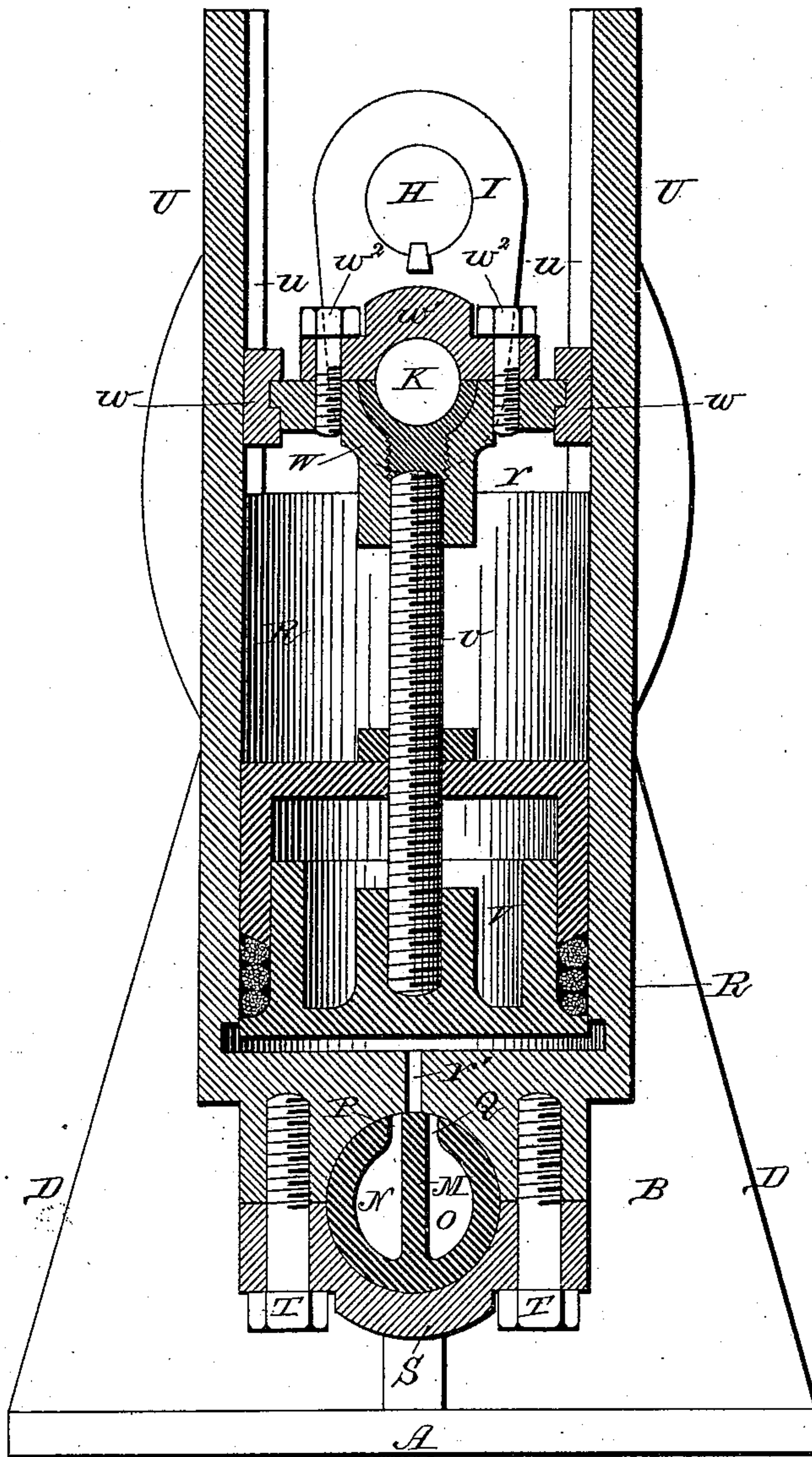
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Fig. 2.



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# UNITED STATES PATENT OFFICE.

JAMES CLARK, OF MEDINA, NEW YORK, ASSIGNOR OF ONE-HALF TO ABIEL BOWEN, OF SAME PLACE.

## STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 316,332, dated April 21, 1885.

Application filed January 3, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES CLARK, a citizen of the United States, residing at Medina, in the county of Orleans and State of New York, have invented a new and useful Improvement in Steam-Engines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to an improvement in steam-engines; and it consists in the peculiar construction and combination of parts, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

The object of my invention is to produce an engine that admits the steam at only one end of the cylinder, said cylinder being pivoted on the steam-chest and oscillated when the engine is in motion, the construction of the engine being such that the pressure of the steam between the piston and the cylinder-head and the gravity of the cylinder makes the pivotal joint of the cylinder with the steam-chest self-packing.

In the accompanying drawings, Figure 1 is a side elevation of a steam-engine embodying my invention. Fig. 2 is a vertical sectional view of the same, taken on the line  $xx$  of Fig. 1.

The frame of the engine is composed of the base A and the standards B C. These standards project upwardly from the center of the base at its ends, and are provided with flanges D at their outer edges, which flanges are the width of the base at their lower sides and incline inwardly to the tops of the standards in the shape of an inverted  $\Lambda$ , as shown.

A flange, E, forms the inner sides of the standards and forms a half-circle, F, between the standards above the connecting-web G. The upper ends of the standards are formed into the lower halves of journal-boxes for the shaft H. A heavy balance-wheel is keyed to the shaft between the standards, and to one of the projecting ends of the shaft is fixed a crank, I, having a wrist-pin, K. The steam-chest L is cylindrical in shape, and projects forwardly from the lower front side of the standard B in a line with the center of the base. The base, standards, and steam-chest are formed integrally, preferably of cast-iron. The steam-chest is divided centrally by a vertical parti-

tion, M, into a supply-chamber, N, and an exhaust-chamber, O. Openings extend rearwardly from these chambers through the front flange of the standard B on opposite sides of the web G, and the supply and exhaust pipes are there connected. A port, P, leads upwardly from the supply-chamber, and a similar port, Q, is located on the opposite side of the partition and connects with the exhaust-chamber. The cylinder R is pivoted on the steam-chest by means of the cap S and bolts T. This cylinder has a closed solid head at the end that is pivoted on the steam-chest, and its opposite end is open, as at  $r$ . Vertical bars U, which are cast integrally with the cylinder, extend upwardly therefrom, and on the inner sides of these bars are formed ways  $u$  for the guide-boxes of the cross-head to travel in. Centrally through the closed head of the cylinder is made the opening or port  $r'$ , which extends to the steam-chest. The piston V is placed in the cylinder, and is provided with a suitable packing-gland in the usual manner. The piston-rod  $v$  connects the piston with the wrist-pin K and the cross-head W, which cross-head is provided with boxes  $w$ , that guide the cross-head up and down upon the ways  $u$ . A cap,  $w'$ , and bolts  $w''$  are provided for securing the cross-head, wrist-pin, and piston-rod together, as shown at Fig. 2.

The operation of my invention is as follows: Steam is admitted through the supply-chamber of the steam-chest and through the cylinder-port into the lower end of the cylinder, where it acts upon the piston and forces it upward, giving a partial rotation to the fly-wheel and causing the cylinder to move a slight distance on its pivotal joint with the steam-chest. By the time that the piston has reached the upward limit of its stroke the cylinder is in a vertical position, with its port directly over the partition between the exhaust and supply ports of the steam-chest and disconnected with both of them. The inertia of the fly-wheel causes the movement of the engine to proceed until the cylinder-port comes in line with the exhaust-port of the steam-chest, and the descending piston forces the steam beneath it through the exhaust-chamber of the steam-chest. Continued rotation of



the fly-wheel brings the cylinder into its initial position, and the operation is repeated, as before.

It will be understood that the pressure of the steam is only imparted to the piston on its upstroke, the remainder of the operation of the engine being dependent upon the inertia of the fly-wheel. In engines that are of small power and that are used for running light machinery, only one cylinder will be necessary; but for heavier engines two or more cylinders should be employed and connected to the shaft in such a manner that one of the cylinders will be taking steam while another exhausts, and thus a continuous power will be exerted upon the shaft at all points of its revolution.

By pivoting the cylinder upon the steam-chest the pressure of the steam between the piston and the cylinder-head and the gravity of the cylinder cause the cylinder to be forced tightly against the steam-chest, and thus forms a self-packing joint, which is so tight as to preclude the possibility of leakage.

An engine constructed as hereinbefore described is simple and cheap, and is adapted for use for a great variety of purposes. I have one of my engines now in operation, running at the rate of from fifty to four hundred revolutions per minute, and doing as much work as larger engines that take steam at both ends of the cylinder.

Having thus described my invention, I claim—

1. The combination of the frame having the cylindrical steam-chest with the shaft, the crank, the piston and rod, and the cylinder having a closed end that is pivoted upon the steam-chest, said cylinder having a single central port in its closed end, and said steam-chest being provided with an inlet and an exhaust port with which the cylinder-port registers alternately when the engine is in operation, substantially as described.

2. The combination of the frame having the cylindrical steam-chest with the shaft, the crank, the piston and rod and cross-head, and the cylinder having a closed end that is pivoted upon the steam-chest and having guide-ways for the cross-head, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JAMES CLARK.

Witnesses:

MERRILL L. JENKINS,  
EDMUND FULLER.