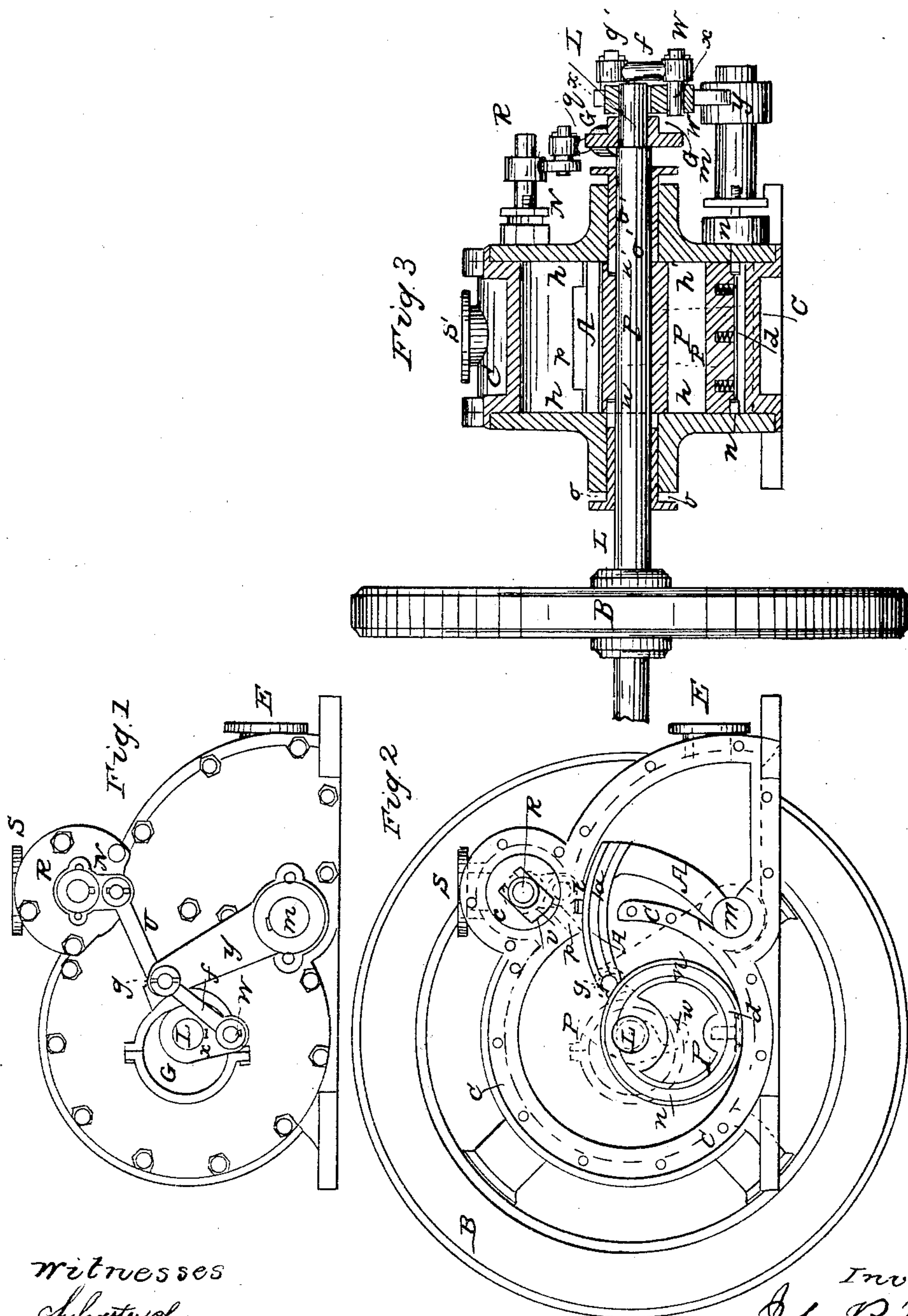


J. B. ROOT.
Steam Engine.

No. 18,989.

Patented Dec. 29, 1857.



witnesses
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D. W. Eaton.

Inventor
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UNITED STATES PATENT OFFICE.

JOHN B. ROOT, OF YOUNGSTOWN, NEW YORK.

ROTARY STEAM-ENGINE.

Specification of Letters Patent No. 18,989, dated December 29, 1857.

To all whom it may concern:

Be it known that I, JOHN B. ROOT, of the village of Youngstown, in the county of Niagara and State of New York, have invented a new and Improved Rotary Steam-Engine; and I do hereby declare that the following is a full description thereof, reference being had to the accompanying drawings, and the letters of reference marked thereon, making part of this specification, in which—

Figure 1 is an end view of the engine showing the parts which are outside of the cylinder in their places. Fig. 2 is an end view with the head h' and the parts outside of it removed showing the internal parts of the engine. Fig. 3 is a longitudinal section.

Like letters represent like parts in all of the figures.

C is the cylinder with the valve chamber, c , and the abutment chamber D, attached to it.

h and h' are the heads of the cylinder which are bolted on to each end of it. In the center of each head and concentric with the bore of the cylinder are hubs which are bored and fitted with the circular boxes o and o' through which the shaft L passes as seen in Fig. 3. the heads extended out on one side so as to cover the ends of the abutment chamber D as seen in Fig. 1.

L is the shaft from which the power of the engine is taken; it passes through the center of the cylinder and has its bearings in the boxes o and o' in the center of the heads h and h' . On one end of the shaft is keyed the crank x and the eccentric G; the crank is made and set on the shaft so that the wrist or pin w is on an exact line with the center of the piston.

P is the piston which is keyed fast on the shaft. It is cylindrical in form. The shaft passes through it eccentrically or near one side, the opposite side touching the inner surface of the cylinder and rubs against it, being made steam tight by the packing plate a . The ends of the piston fit tight against the heads of the cylinder h and h' and rub against them being made steam tight by the packing rings marked n Figs. 2 and 3.

A is the abutment; it oscillates on its axis m as the piston moves around. The end of it is fitted with a gib g which rubs against the piston and is fitted into the end of the abutment with a hinge joint so that it may

regulate itself to the position of the piston and always have a good bearing upon it. The upper part of the abutment extends the whole length of the cylinder and rubs against the heads at each end. It is made steam tight against the heads by the packing plates a (Fig. 2) which are let into each side of the upper part of the abutment. The upper surface of the abutment rubs against the packing plate e (Fig. 2) which is fitted into a groove in the metal of the cylinder. This makes a steam tight joint between the top of the abutment and the cylinder. The upright part of the abutment which connects the upper part with the axis m is narrower than the upper part leaving a space on each side between it and the heads which allows the exhaust steam to pass it. The axis of the abutment m extends through the head h' and has the lever y keyed on the end of it. This lever is made and keyed on so that the pin g' in the end of it will be exactly opposite to the center of the hinge of the gib, in the end of the abutment. The connecting rod f connects the pin g' with the crank pin or wrist w and is of the same length as the distance from the center of the piston to the center of the gib hinge g . Therefore it will be seen that the crank x will govern the motion of the abutment and always keep the end of the abutment at g in contact with the piston. The eccentric G works the valve v by means of the rod q which acts upon the lever N which is attached to the valve. The valve v acts over the port p and regulates the induction and cutting off of the steam. The eccentric is set upon the shaft and the length of the valve rod regulated so that the valve will always open the port p as soon as the piston has passed the steam port p and close again at the point in the revolution at which it is set to cut off, it can be made to cut off at any point of the revolution by regulating the eccentric and rod for that purpose.

The manner in which the steam acts to give motion to the engine is as follows. The steam is admitted into the valve chamber c through the steam pipe s and when the valve v is opened passes from there into the cylinder through the port p and passes upon the piston P forcing it around in the direction of the arrows until it passes the opening b under the abutment when the steam exhausts through the opening b into the

abutment chamber D and from there passes
off through the exhaust pipe E. While the
piston is passing the abutment, that is from
the time the steam exhausts until the pis-
5 ton passes the port *p* and again receives
steam, there is no force exerted, which makes
a dead point. This is overcome by the bal-
ance wheel B which carries the piston on
past the port *p* when it receives the pres-
10 sure of the steam again as before and the
motion of the engine is continued.

The engine can be used with or without
the cut-off valve *v*.

What I claim as my invention and desire
to secure by Letters Patent is—

The arrangement of means for operating
the oscillating abutment and the valve sub-
stantially as herein set forth.

JOHN B. ROOT.

Witnesses:

S. OLNEY,
DOUGLAS W. EATON.