

Eby & Phelps,
Rotary Steam Engine.
N^o 2764 *Patented Aug 26, 1842.*

Fig 1

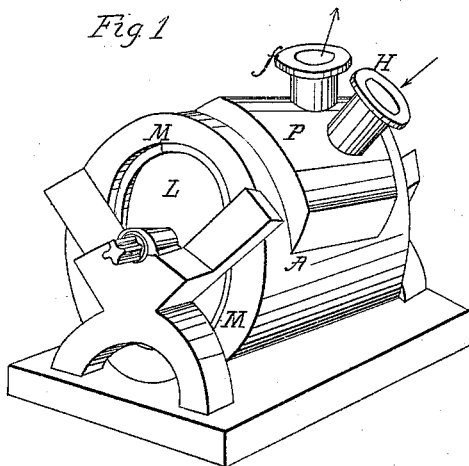


Fig 2.

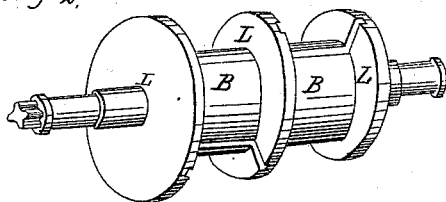


Fig 3.

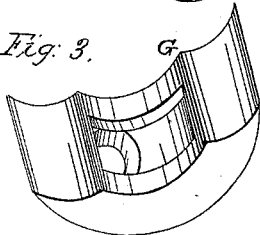


Fig 4

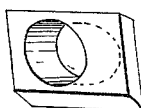
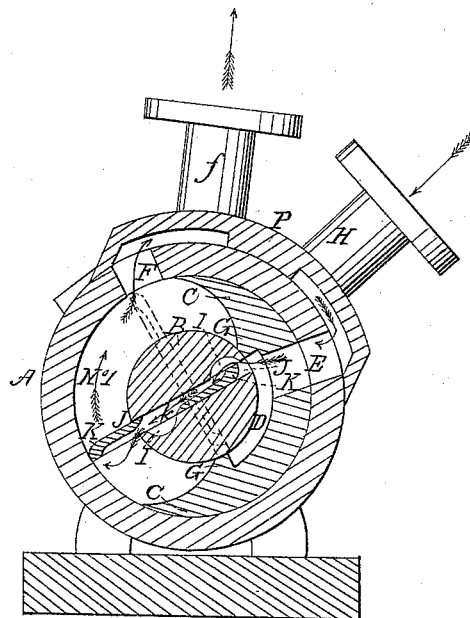


Fig 5.



UNITED STATES PATENT OFFICE.

SOLOMON M. EBY, OF PAINT TOWNSHIP, WAYNE COUNTY, AND DAVID N. PHELPS, OF
JEFFERSON TOWNSHIP, RICHLAND COUNTY, OHIO.

ROTARY STEAM-ENGINE.

Specification of Letters Patent No. 2,764, dated August 26, 1842.

To all whom it may concern:

Be it known that we, SOLOMON M. EBY, of Paint township, Wayne county, Ohio, and DAVID N. PHELPS, of Jefferson township, Richland county, State of Ohio, have invented a new and useful Improvement in Rotary Steam-Engines, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a perspective view of the engine. Fig. 2 is a perspective view of the revolving steam wheel detached from the stationary cylinder. Fig. 3 is a perspective view of the stationary head and steam box detached from the interior of the fixed cylinder. Fig. 4 is a perspective view of one of the sliding perforated heads or pistons separated from the steam wheel. Fig. 5 is a vertical cross section.

Similar letters refer to corresponding parts.

The nature of our invention consists in the peculiar construction of the engine by which a regular rotary motion of the wheel is produced by the direct action of the steam to sliding heads of said wheel.

The stationary cylinder A Figs. 1 and 5 in which the wheel B revolves is circular on the outside and eccentric on the inside, the eccentricity of form of the interior being produced by a semi-circular head C tapered at each end so as to form two inclined planes and recessed in the middle forming a steam chamber D Figs. 3 and 5. The said semi-circular head C is fastened securely to the interior of the cylinder by screws or in any convenient way. The thickest portions of the head C next to the steam chamber form shoulders G corresponding with the circumference of the wheel B against which they fit perfectly, any wear or openings produced by the rubbing of the wheel against said shoulders or portions G being closed by sliding blocks of metallic or other packing forced against the wheel by screws or other suitable means. A steam way E Fig. 5 is made through this head and through the cylinder A and cap P for the introduction of the steam to the steam chamber D.

An escape aperture F for the discharge of the steam after it has performed its intended office is made through the cylinder about one fourth its circumference from

the induction pipe H more or less and near one of the tapered ends of the fixed head C.

The revolving wheel B is fitted to the shoulders G of the fixed head C in the interior of the cylinder A; its semi-diameter is exactly equal to the distance from the center of the wheel and cylinder to the shoulders G of the fixed head C against which it revolves. Through this wheel is made a rectangular mortise J in which is placed a sliding valve K in length a little less than the space between the interior of the cylinder A opposite the shoulder G and the said shoulder G. This valve is perforated obliquely with an opening $\frac{1}{2}$ for the passage of the steam from one side of the valve to the other.

The groove in the wheel in which it moves is enlarged near the circumference of the wheel forming steam ways I for the passage of the steam through the steam wheel and valve from one side to the other of the valve. The wheel is as long as the width of the fixed head to which it is fitted and against which it revolves. Both wheel and head are embraced or inclosed by two circular parallel plates L Figs. 1 and 2 fixed to and revolving with the shaft of the wheel, of a diameter equal to that of the interior of the regular part of the fixed cylinder which confines the steam between said plates until it escapes at the induction pipe f the joints between the inside of the cylinder and the outside of the circular plates L being packed by circular rings of packing M.

The shoulders G Fig. 5 must be wider than the mortises J so as to cover the lower opening while the upper one is open to receive steam, said shoulders being so arranged as to embrace a space a little greater than one fourth the circumference of the cylinder.

The operation of this engine is as follows: The steam from the boiler is conducted by the induction tube H to the chamber D in the stationary head C where it presses upon the end of the sliding piston K immediately after passing the shoulder G and forces the other end of the piston out of the groove in the wheel and against the inside of the cylinder where it is held, making a close joint without requiring any packing and as the end of the piston wears the steam still forcing it against the inside of the cylinder, thereby compensating for the wear of the

piston, the steam simultaneously passing obliquely through the piston from one side thereof to the opposite side against which it acts simultaneously and at right angles thereto, the steam being confined between the piston and the stationary head, driving the said end of the piston around within the cylinder in the direction of the arrow No. 1 until it arrives at the escape opening F through which and the eduction tube the steam escapes into the atmosphere at the same time in performing its rotary motion carrying with it the wheel and shaft from which the rotary motion desired is obtained, and when the last mentioned end of the sliding valve arrives at the inclined plane of the fixed head it is forced into the groove to be acted on by the steam in the same manner as the first mentioned end as soon as it passes the aforesaid shoulder G at the same time forcing the first mentioned end of the piston out of said groove in like manner as above set forth, the steam passing from one side of the sliding piston to the other and in this manner keeping up a rotary motion and compensating for the wear of the rubbing surface, of the ends and sides of the sliding piston in the manner set forth without the use of packing at the sides and ends.

Although we have described only one wheel, one valve, one pair of circular plates, and one fixed head which will answer very well with a balance wheel to equalize the rotary motion of the wheel, yet it will be evident to the engineer that two wheels and valves may be applied to the same shaft (as represented in the drawing), the second valve sliding at right angles to the first in the same manner as above set forth and acted on in like manner by which means a regular rotary motion will be kept up without the use of a balance or fly wheel as in

the use of only one sliding piston. The arrangement however need not be limited to one or two wheels and valves on the same shaft; they may be extended to three, four, or more having the valves arranged so as to have the commencement of the action of the steam take place at different periods of time, but these and the corresponding circular plates and fixed heads being all constructed like those above described will render any further description unnecessary.

What we claim as our invention and which we desire to secure by Letters Patent is—

Passing the steam through the revolving wheel and sliding piston from one side to the other causing the steam to act simultaneously against the end of the piston in passing the steam chamber in the fixed head and against the flat side of the opposite end of the piston in passing through the interior of the cylinder, thus forcing out the piston from the wheel and closing the joints between the flat side and end of the sliding valve and the surfaces of the wheel and cylinder against which they are pressed by the steam and thus turning the wheel and shaft by the expansive force of the steam without the use of any packing at the aforementioned joints or the application of other power in the manner herein set forth; or in any other mode substantially the same.

SOLOMON M. EBY.

DAVID N. PHELPS.

Witnesses present at the signing of Solomon M. Eby:

JAMES Y. PINKERTON,
J. J. LONG.

Witnesses present at the signing of David N. Phelps:

WM. P. ELLIOT,
E. MAHER.