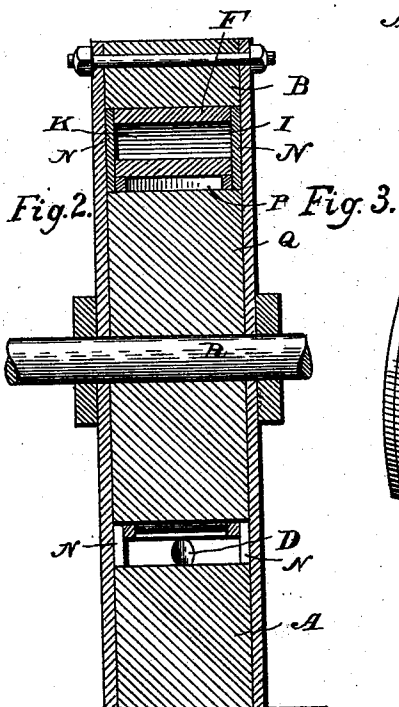
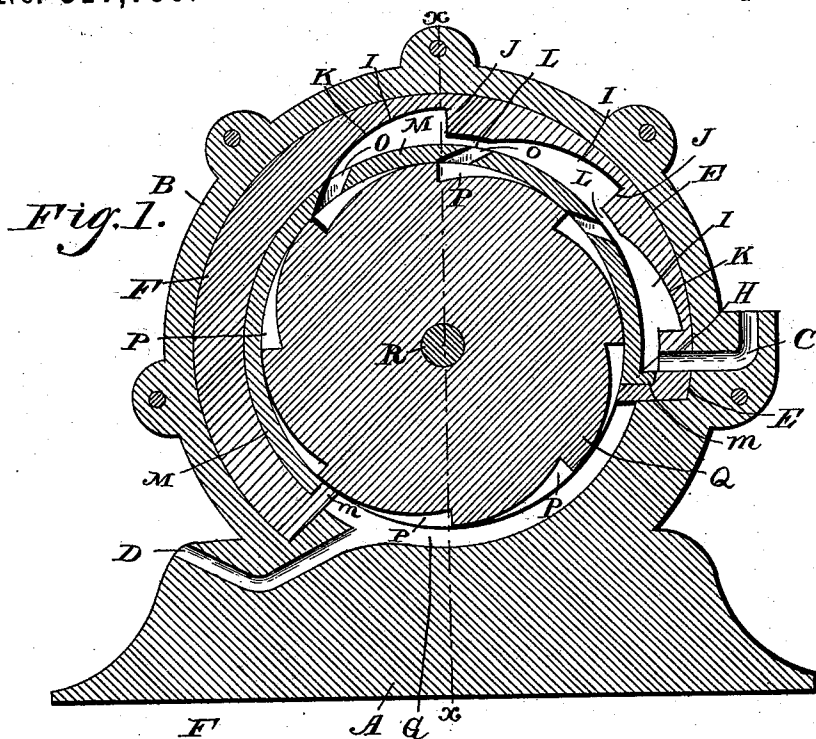


(No Model.)

W. M. BYRD.
ROTARY STEAM ENGINE.

No. 517,790.

Patented Apr. 3, 1894.



Witnesses

Julius Ulke Jr.
D. O. Holman

By *his* Attorneys.

Inventor

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UNITED STATES PATENT OFFICE.

WALTER MOSELY BYRD, OF MOUNT GILEAD, ASSIGNOR OF ONE-HALF TO
W. D. CLARK AND A. D. CLARK, OF FLY, NORTH CAROLINA.

ROTARY STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 517,790, dated April 3, 1894.

Application filed July 18, 1893. Serial No. 480,835. (No model.)

To all whom it may concern:

Be it known that I, WALTER MOSELY BYRD, a citizen of the United States, residing at Mount Gilead, in the county of Montgomery and State of North Carolina, have invented a new and useful Rotary Steam-Engine, of which the following is a specification.

This invention relates to rotary steam engines, and it has for its object to provide certain improvements in rotary engines to secure the more effective packing of the revolving steam drum therein, and at the same time to provide for a complete utilization and impacting of the live steam.

To this end the main and primary object of the present invention is to improve the construction described and claimed in my pending application, serially numbered 466,512, in order to more effectively secure the objects sought for.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings:—Figure 1 is a central vertical longitudinal sectional view of a rotary steam engine constructed in accordance with the present invention. Fig. 2 is a vertical section on the line $x-x$ of Fig. 1. Fig. 3 is a detail in perspective of the packing abutment one of the side plates of which is shown partly in section.

Referring to the accompanying drawings, A represents a suitable bed or base to which is secured the sectional steam cylinder B. The sectional steam cylinder B, incloses therein a circular steam chamber, as is usual in engines of the rotary type, and said steam cylinder is pierced at one side by the steam inlet port C, and at an opposite side by the exhaust port D. Intermediate of the inlet and exhaust ports of the steam cylinder the same is provided in its inner wall with an off-standing segmental recess E, which is adapted to receive the segmental packing abutment F. The segmental packing abutment F, extends almost entirely around the interior wall of the steam cylinder, and is so disposed between the inlet and exhaust ports as to have its ends

project inwardly within the steam cylinder beyond its inner wall, whereby the exhaust space G, is left between its projecting ends, and which exhaust space always communicates with the exhaust port D, to insure a free exhaust of the utilized steam from the cylinder.

The said packing abutment F, is provided near one end thereof with the inlet opening H, which is in a line with the inlet port C, of the cylinder, and communicates directly with the first one of a series of off-standing impacting pockets or recesses I, formed in the body of the impacting abutment and standing off from the interior steam space or chamber of the cylinder. The said impacting pockets or recesses may be arranged or formed in the packing abutment in any number found expedient to employ, and each of said pockets or recesses is provided with a rear straight shoulder wall J, and a forward curved wall K. The several impacting pockets or recesses I, communicate directly with each other by the intermediate connecting channels L, which channels are walled in at one side, as well as the pockets or recesses themselves, by the removable abutment ring or plate M. The abutment ring or plate M, is formed of any suitable packing material and has its ends register with the shoulders m , formed near the end of the packing abutment for the reception thereof, and the said removable abutment plate, which is more properly a cap plate for the abutment, is held in proper position facing the inner side of the packing abutment, by the inner projecting ends of the abutment side plates N, which plates are bolted to the opposite sides of the abutment so as to inclose the impacting pockets or recesses and to hold the removable cap plate M, in proper position.

The removable curved cap plate M, is bored with a series of steam openings or ports O, which steam openings or ports are in a direct line with the forward curved walls K, of each of the impacting pockets or recesses, whereby means are provided for directing the impact of steam from the pockets squarely against the shoulders of the steam buckets P, formed in the periphery of the steam drum Q. The steam drum Q, is mounted on the shaft R, and is adapted to turn within the steam cyl-

inder in contact with the removable abutment plate M, and out of contact with the remaining inner portion of the cylinder, where the exhaust space G, is located, so that as each
 5 bucket of the steam drum leaves one end of the packing abutment it discharges directly into the exhaust space of the cylinder.

Now from the foregoing it will be apparent that the series of inclosed and intercommunicating impacting pockets or recesses form a
 10 steam impacting chamber or reservoir into which the steam is impacted until it becomes as dense as the steam in the boiler, and consequently having the same pressure as said
 15 steam, so that it will be practicably effective when it is expanded squarely against the shoulders of the drum buckets through the steam openings or ports leading from the several impacting pockets or recesses of the im-
 20 pacting chamber formed thereby. By reason of separating the impacting recesses or pockets from the periphery or face of the steam drum by means of the removable abutment cap plate M, the steam drum is relieved of all
 5 unnecessary pressure, while at the same time the advantage of a double impact is secured, first from the boiler to the steam impacting chamber, and then from the several impact-
 30 ing pockets or recesses of such chamber to the steam drum, and it is to be observed that owing to the proximity of the steam impacting chamber to the steam drum and the area thereof, an over supply of closely impacted steam is always contained within the steam
 35 cylinder ready to spend its expansive force against the shoulders of the steam buckets.

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or
 40 sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

- 45 1. In a rotary steam engine, the steam cylinder having a series of interior impacting

pockets communicating with each other and the steam inlet, a cap plate facing the inner wall of the steam cylinder to inclose said im-
 50 pacting pockets and having steam openings or ports aligning with the forward walls of each pocket, and the bucket drum substantially as set forth.

2. In a rotary steam engine, the cylinder having oppositely located inlet and exhaust
 55 ports, a segmental packing abutment seated within the cylinder between the ports thereof and having a series of impacting pockets communicating with each other and the inlet
 60 port, a removable abutment cap plate facing the inner side of said packing abutment and having a series of steam openings or ports communicating with said impacting pockets,
 and a rotary bucket drum or piston mounted within said cylinder and traveling in contact
 65 with said abutment cap plate, substantially as set forth.

3. In a rotary steam engine, the combination of a steam cylinder having oppositely lo-
 70 cated inlet and exhaust ports, a segmental packing abutment mounted inside of the cylinder between the ports thereof and provided with a series of intercommunicating impact-
 75 ing pockets or recesses also communicating with the inlet port, said impacting pockets each having a rear straight shoulder wall and a forward curved wall, a removable cap plate
 fitted to the inner side of said packing abutment and provided with a series of steam
 80 openings or ports disposed in a direct line with the forward curved wall of each impact-
 ing pocket and a bucket steam drum mounted within said cylinder and traveling in contact
 85 with said removable cap plate, substantially as set forth.

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

WALTER MOSELY BYRD.

Witnesses:

G. N. SCORBORO,
 T. B. HOWELL.