A. ARNOLD.

STEAM ENGINE.

No. 19,537. Patented Mar. 9, 1858.

Fig. 2.

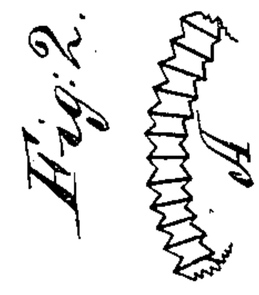
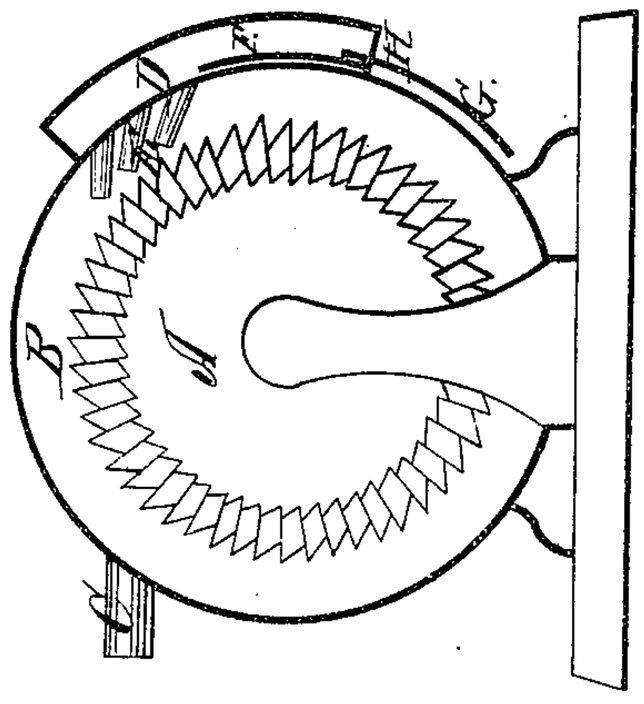


Fig. 1.



Witnesses:

B. Urner

Geo B. Arnold

Inventor:

A. Arnold

UNITED STATES PATENT OFFICE.

ALFRED ARNOLD, OF NEW YORK, N. Y.

ROTARY STEAM-ENGINE.

Specification of Letters Patent No. 19,537, dated March 9, 1858.

To all whom it may concern:

Be it known that I, ALFRED ARNOLD, of New York, in the county and State of New York, have invented a new and useful Improvement in Percussion Steam-Engines; and I do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification.

Owing to the enormous velocity necessary for the economical use of the percussion engine it is impracticable to have either packed, or working joints, connected with the wheel or revolver, and to save all danger of fracture which would otherwise be liable to occur from the centrifugal force it should be made from a single piece of metal and of as simple form as possible. The steam should be applied to the periphery of the wheel at its full force and density in the boiler, that it may expend its entire expansive force on the wheel rather than a portion of it in passing a throttle valve or other similar device for regulating the quantity used, and after having spent its force it should leave the wheel offering as little resistance as possible to its motion.

The nature of my invention consists in so constructing a percussion engine that it shall as nearly as possible comply with the above requirements.

A, Figure 1, is a round wheel, made from a single piece of metal, and may be of any diameter and thickness desired, though I would recommend its thickness to be nearly equal to twice the diameter of the jets of steam used. The periphery of this wheel is beveled from the center each way at an angle of about 45° from either surface. On this beveled periphery are cut V shaped notches, as shown in Figs. 1 and 2. The faces of these notches which receive the concussion of the steam, are on a line with radii drawn from the center of the wheel, while the opposite sides incline at an angle terminating at the base of the face of the adjoining notch. This wheel may be inclosed in a case B, Fig. 1, and the exhaust steam conducted away through the escape pipe C. On the periphery of B, is attached a steam chest D, from which the steam is conducted to the wheel by means of several small perforations or tubes E, over which the slide valve F, works. To F is attached a small rod G, which should pass through a stuffing box at H, and may then be connected by any of the well known devices to a governor, or regulator. The object of applying more than one jet of steam, is, first, a small jet can be applied more directly to the faces of the notches than a large one— Second, the wheel may be made of a thinner plate, thus offering less resistance to the air or exhaust steam in which it runs. And third, no loss by expansion is experienced when the governor is closing the valve except in the single orifice that is being closed. Thus admitting the steam to the wheel at its full pressure however small the quanity used.

In operating the percussion engine steam is admitted into the chest D, passes through the perforations or tubes E, where it forms jets which strike the faces of the V shaped notches on the periphery of the wheel A, where it spends its force as it is divided and passes away from the resisting surface of the wheel. When a diminution of power occurs the governor operating on the valve F, closes a sufficient number of the orifices E, to stop a proportional quantity of steam.

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

1. The beveled periphery of the wheel A, whereby the steam expends its force on the faces of the notches while being divided and passed away from the resisting surface of the wheel.

2. The steam chest D, with its several perforations, as described.

3. The combination of the valve F, and steam chest D, with the wheel of a percussion engine whereby the power of the engine may be decreased without decreasing the velocity and density of the steam applied substantially as described and for the purpose specified.

ALFRED ARNOLD.

Witnesses:

B. URNER,

GEO. B. ARNOLD.