C. R. ORD.

ROTARY ENGINE.

APPLICATION FILED DEC. 3, 1907.

968,969.

Patented Aug. 30, 1910.

Fig. 1

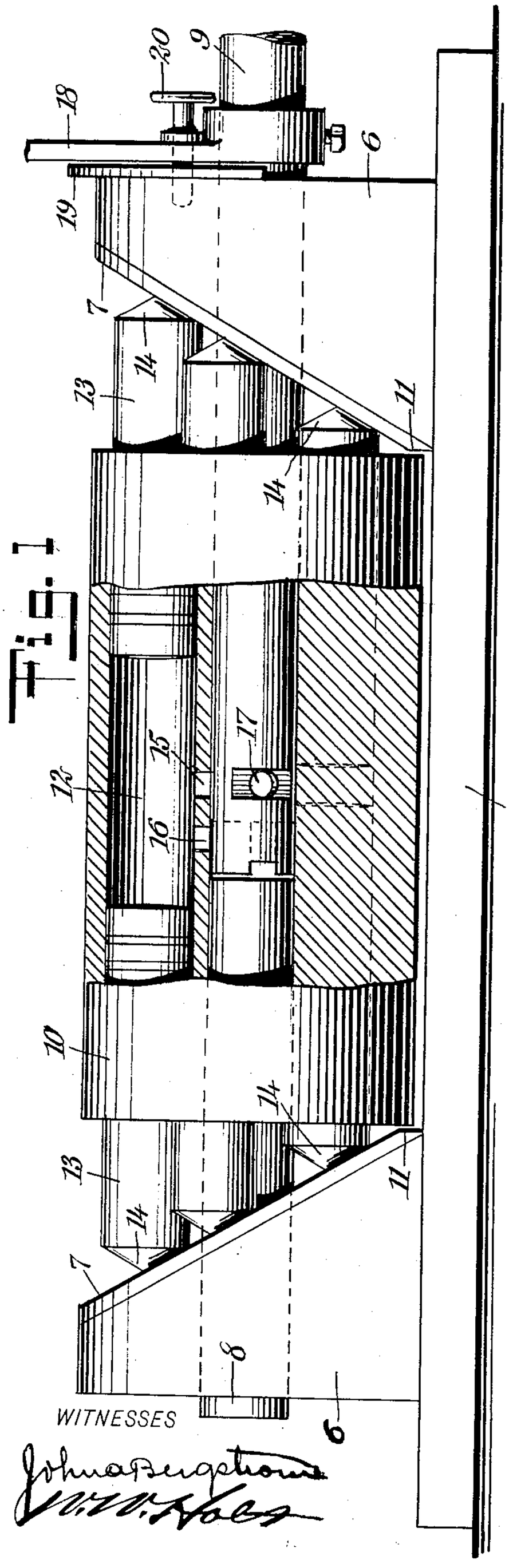


Fig. 3

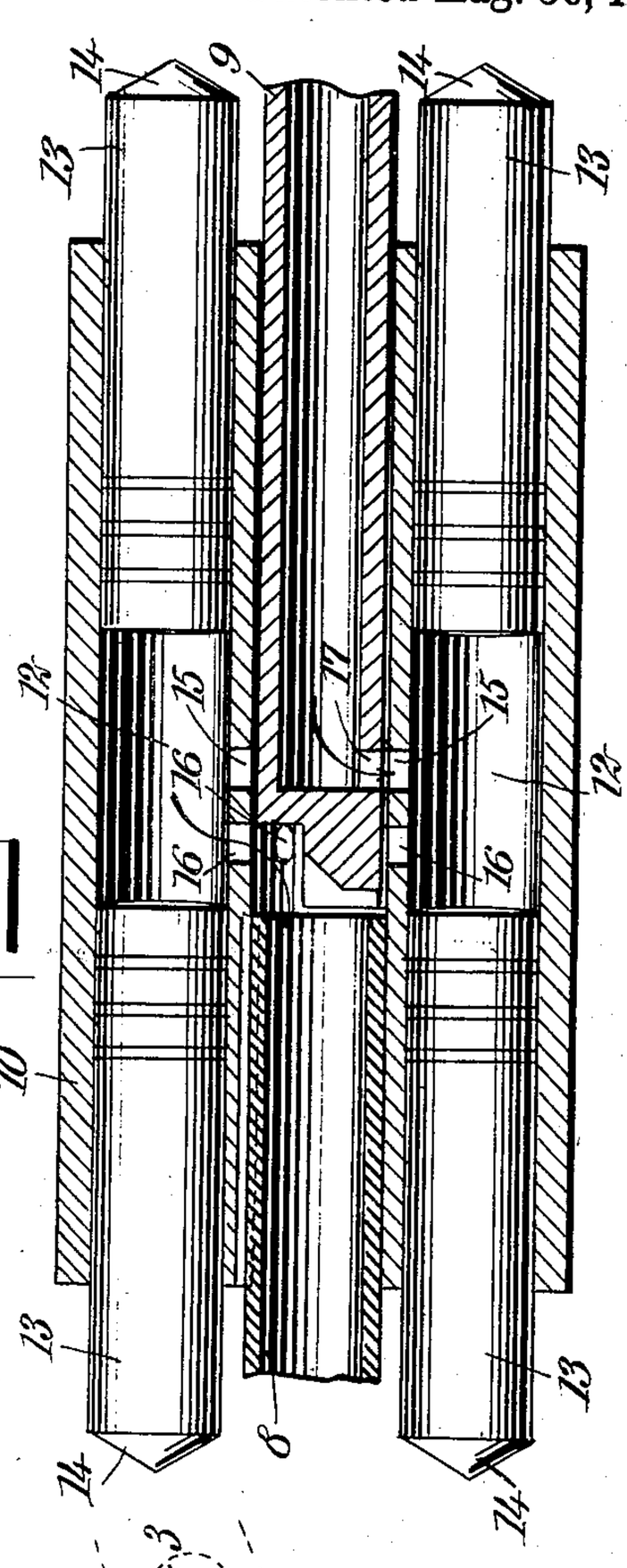
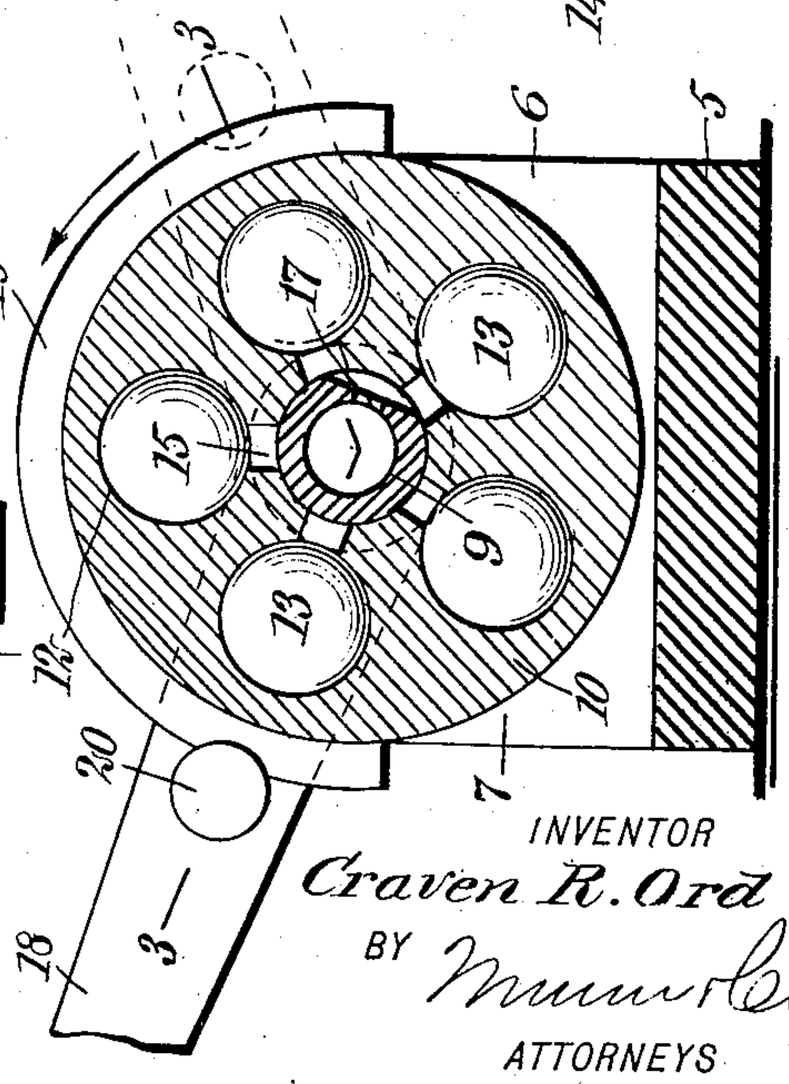


Fig. 2



WITNESSES

INVENTOR

Craven R. Ord

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

CRAVEN ROBERT ORD, OF McADAM JUNCTION, NEW BRUNSWICK, CANADA.

ROTARY ENGINE.

968,969. Specification of Letters Patent. Patented Aug. 30, 1910.

Application filed December 3, 1907. Serial No. 404,896.

To all whom it may concern:

Be it known that I, CRAVEN ROBERT ORD, a subject of the King of Great Britain, and a resident of McAdam Junction, in the Province of New Brunswick and Dominion of Canada, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

The invention is an improvement in rotary engines of the character embodying a number of cylinders arranged on a shaft approximately parallel thereto, the cylinders each having pistons projecting from its opposite ends and acting on relatively inclined or cam surfaces.

The present invention has in view an engine of this character in which that portion of each cylinder between the inner ends of the piston is unobstructed, and the shaft by which the cylinders are carried composed of an admission and an exhaust shaft arranged end to end, with the cylinders fixed to the exhaust shaft and relatively immovable with respect thereto and revoluble relatively to the admission shaft.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the preferred practical embodiment of my improved engine, partly in central section; Fig. 2 is a cross-section of the same; and Fig. 3 is a longitudinal section through the engine cylinder, substantially on the line 3—3 of Fig. 2.

In the engine construction, any suitable base 5 may be used, on which are mounted bearing-blocks 6, spaced apart and provided with opposed reversely-inclined faces or cam surfaces 7, the latter being preferably in the nature of hardened steel plates. In one of the bearing-blocks 6 is journaled, substantially midway its height, a hollow driving-shaft 8, and in the opposite bearing-block is journaled a hollow shaft 9 in alinement with the shaft 8, the said shafts meeting at one side of a median plane between the cams or inclined surfaces 7. The bore of the shaft 8 is open throughout its length and the bore of the shaft 9 has a wall over its inner end, as best shown in Fig. 2.

Keyed, or otherwise rigidly fixed to the shaft 8, and journaled on the shaft 9, is a cylinder 10, of such length as to neatly fit between shoulders 11 formed near the bottom of the bearing-blocks 6, said shoulders operating to prevent any sliding movement of the cylinder between the blocks. The cylinder 10 is constructed with a series of bores or smaller cylinders 12, which pass continuously therethrough, and are arranged parallel to the shafts 8 and 9, and near the perimeter of the cylinder 10. These bores may be of any desired number, five being shown in the present instance, and are preferably equally spaced apart.

Within each bore 12, are slidably fitted two pistons 13, which respectively pass through the opposite ends of the cylinder and have conical outer ends 14, of such pitch or inclination as to exactly conform to the inclination of the cam or inclined surfaces 7. This inclination will vary with the speed and size of the engine required. Each bore 12 is provided with an admission port 15 and an exhaust port 16, the admission ports of the several bores being arranged in the same transverse plane in which is also located an admission port 17, formed in the hollow shaft 9. The port 17 is extended in width on the outer surface of the shaft, as by slotting the shaft transversely over the port, as clearly shown in Figs. 1 and 2, whereby the admission may take place in one bore 12 before the bore in advance thereof is entirely cut off. The exhaust ports 16 of the several bores are arranged in the same transverse plane with a cut-away or slotted portion in the end wall of the shaft 9, which places these ports successively in communication with the bore in the driving-shaft 8, whereby the exhaust of the engine will be discharged therethrough.

Rigidly and adjustably attached to the shaft 9 at any convenient point, preferably adjacent to the bearing-block 6, through which it passes, is a controlling lever 18, traversing an arc 19 concentric to the shaft and secured to the block 6. This arc is engaged by any convenient device carried by the lever as, for example, the set-screw 20, acting to hold the lever and consequently the shaft 9 in any desired position of adjustment.

In the operation of the engine, the shaft 9 will ordinarily be turned to cause the admission to take place into the bores of the cylinder as soon as the pistons are fully moved inwardly by the cam surfaces as, for

example, as shown in Fig. 2. The actuating agent passing through the shaft 9 and successively into the bores of the cylinder through the admission ports, will force the pistons against the cam surfaces and cause the cylinder to revolve in a direction depending on the side of the cylinder the admission port of the admission shaft is disposed. The elongation of the admission port in the admission shaft effected by slotting the shaft, will determine the travel of the cylinder between the beginning of the admission and the point at which the admission is fully cut off, and should be such that the actuating agent will be permitted to work expansively before exhaust takes place, the latter occurring through the driving shaft, as before stated, directly the pistons are fully projected.

When the admission and exhaust ports are in the location represented in the drawing figures, the exhaust from the bores will be cut off just before the pistons are fully retracted, whereby a cushion will be formed between the opposed pistons of each bore, which will operate to keep the points of the pistons in contact with the cam or inclined faces of the bearing-blocks. This will prevent any hammering or pounding of the engine when in operation. The position of the admission and exhaust may obviously be readily varied, and the direction of rotation of the cylinder, if desired, reversed by the actuation of the controlling-lever 18.

The invention as shown and described while being the preferred arrangement and construction of my improved engine, the same may obviously be modified in numerous particulars without departing from the nature of the invention as defined in the claims annexed.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a rotary engine, a base, bearing-blocks rigid with the base and having downwardly and inwardly-inclined faces, an admission shaft and an exhaust shaft arranged end-to-end, a member carried on the said shafts between the bearing-blocks and having a series of cylinders arranged parallel to the shafts, and a free piston slidable in each end of each cylinder and bearing on the inclined face of one of said blocks.

2. In a rotary engine, an admission shaft and an exhaust shaft arranged end to end, a member arranged on said shafts and immovable longitudinally with respect thereto and having a series of cylinders arranged parallel to the shafts, bearing-blocks having downwardly and inwardly-inclined faces arranged at the outside of said member at the opposite ends thereof, and free pistons slidable in the opposite end portions of each cylinder and bearing on the inclined faces of the blocks, with that portion of each cylinder between the inner ends of the pistons unobstructed.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CRAVEN ROBERT ORD.

Witnesses:
GARNET L. ORD,
ARTHUR L. JOLLIFFE.