A. McCORMICK.

ROTARY ENGINE.

APPLICATION FILED JAN. 16, 1911.

1,014,162.

Patented Jan. 9, 1912.

3 SHEETS—SHEET 1.

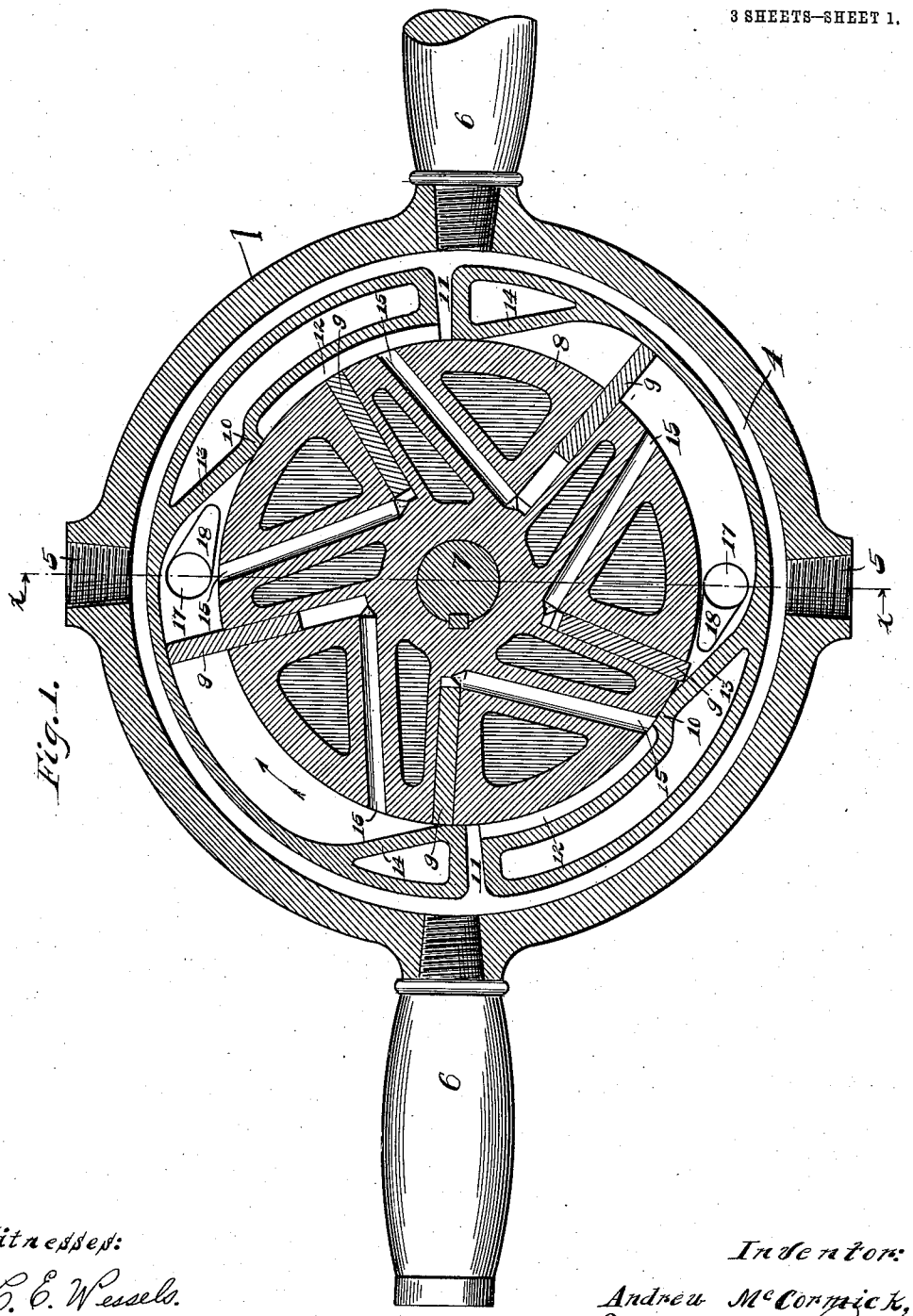

Fig. 1.

Witnesses:

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Inventor:

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3 SHEETS—SHEET 2.

Fig. 3.

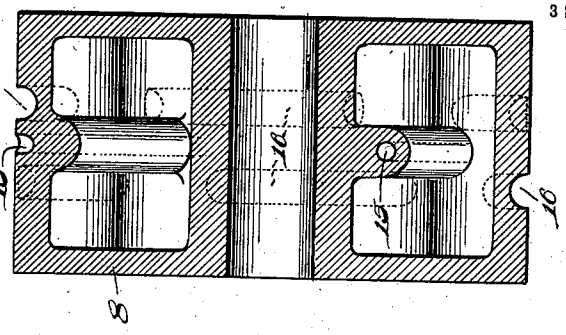
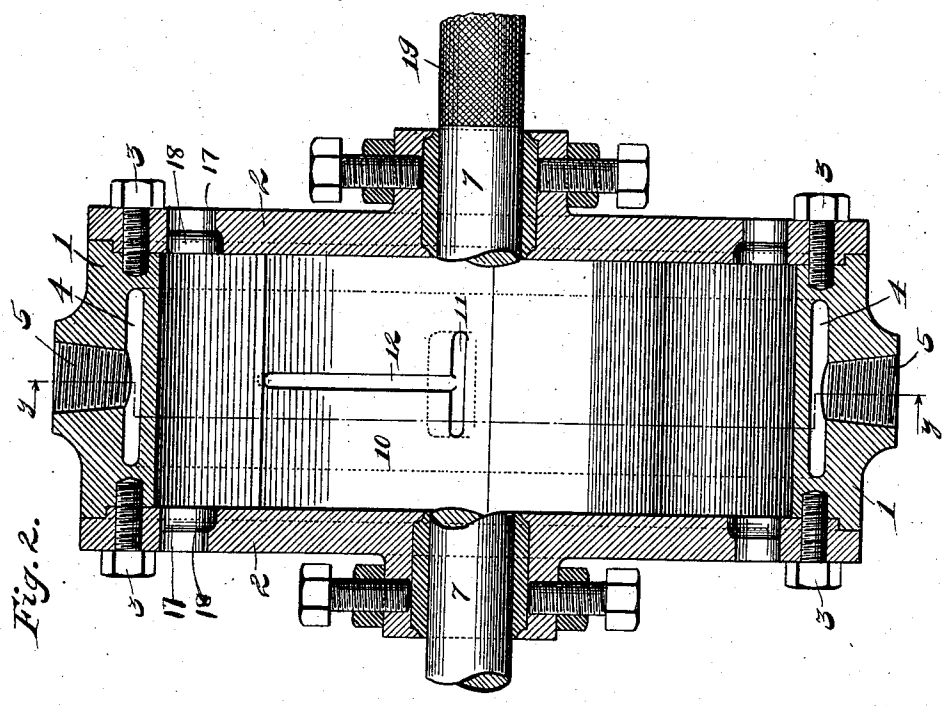


Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 4.

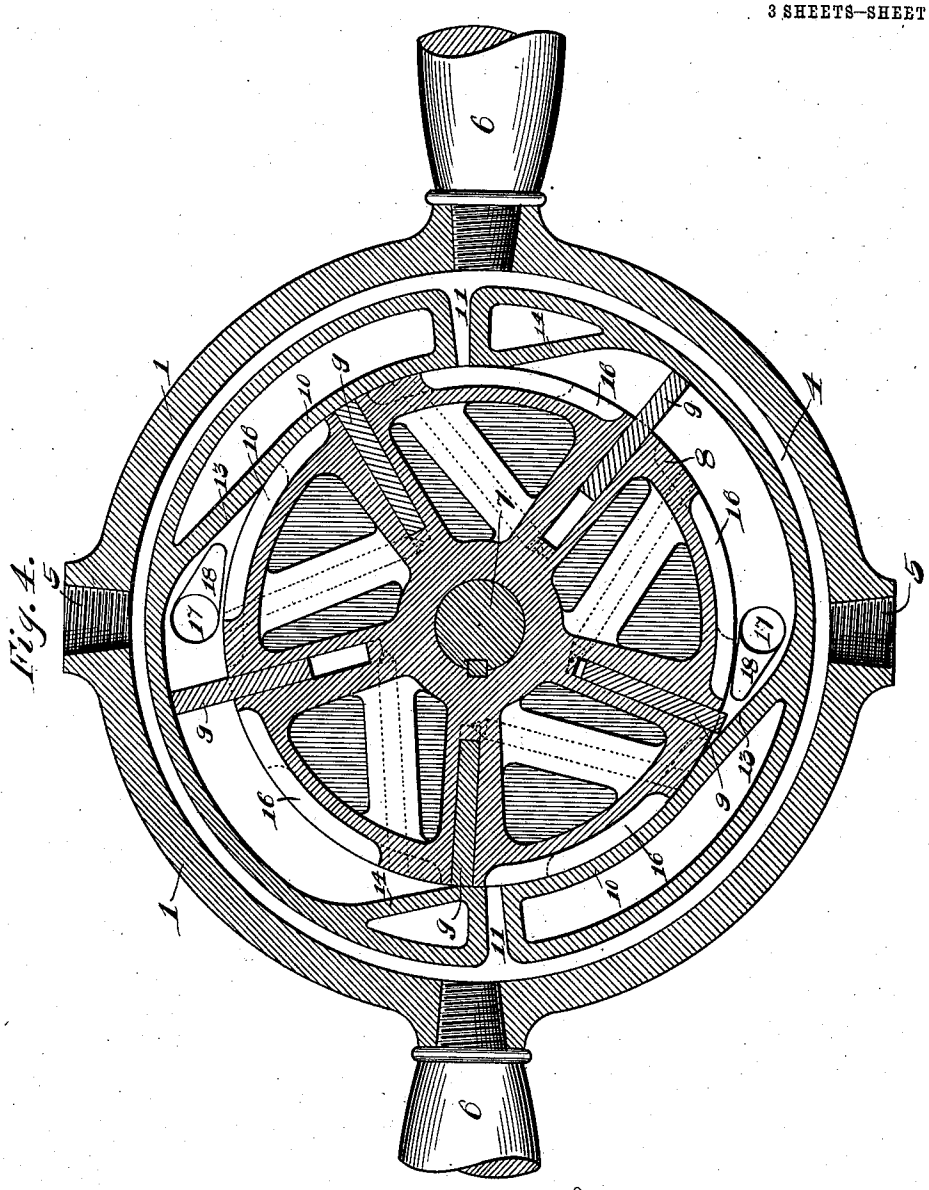
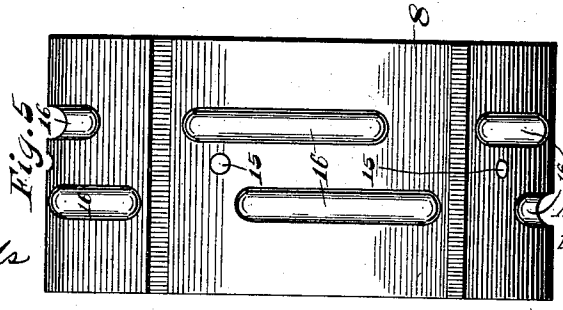


Fig. 5.



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UNITED STATES PATENT OFFICE.

ANDREW McCORMICK, OF CHICAGO HEIGHTS, ILLINOIS.

ROTARY ENGINE.

1,014,162. Specification of Letters Patent. Patented Jan. 9, 1912.

Application filed January 16, 1911. Serial No. 602,877.

To all whom it may concern:

Be it known that I, ANDREW McCORMICK, a citizen of the United States, and a resident of Chicago Heights, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

My invention relates to improvements in rotary engines and has for its object the provision of a rotary engine of improved construction and operation.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which—

Figure 1 is a central transverse section of a rotary engine embodying my invention, Fig 2, a section of the engine taken on line *x—x* of Fig. 1, Fig. 3, a section of the rotary piston employed in the engine, Fig. 4, a section taken on line *y—y* of Fig. 2, and Fig. 5, an elevation of the rotary piston.

The preferred form of construction as illustrated in the drawings, comprises an outer substantially cylindrical casing 1 having its ends closed by heads 2 secured in position by means of bolts 3. Formed in the wall of casing 1 is a supply passage 4 having threaded openings 5 giving access thereto for the supply of steam, compressed air, or other fluid under pressure. Handles 6 are provided at opposite sides of casing 1 for convenience in manipulating the same. A shaft 7 is mounted in suitable bearings in heads 2 and carries a rotary piston 8 keyed thereto and operating in the chamber formed in casing 1. Five equally spaced radially slidable piston blades 9 are mounted in the piston 8 and arranged to coöperate with suitable abutments 10 formed upon the inner periphery of casing 1 to cause rotation of piston 8 and shaft 7. At the end of each of the abutments 10 away from the approach of blades 9 during their rotation, or in other words at the rearward end, a port 11 is formed communicating with passage 4 and a centrally disposed recess 12 is formed in the face of each of said abutments in communication at its rearward end with port 11 and extending forwardly to near the forward end of the abutments. The forward end 13 and the rearward end 14 of each of the abutments 10 are made sloping as shown to act as cam surfaces to cause and permit radial movement of the blades 9 in piston 8. A passage or port 15 leads from the inner end of each of the wells for the blades 9 to a point in the central portion of the periphery of piston 8 and to the rear of the corresponding piston blade as shown. Between blades 9 the piston 8 is provided with sets of admission recesses 16, each set consisting of two similar recesses spaced to each side of the central portion of said piston and one recess being arranged in circumferential advance of the other, as shown in Fig. 5. Exhaust ports 17 are provided in each of the heads 2 adjacent the forward ends of abutments 10 and recesses 18 are formed in the inner faces of the heads 2 in open communication at their forward ends with exhaust ports 17 and extending rearwardly toward the corresponding abutment 10. A flexible shaft 19 is secured to one end of shaft 7 and the other end thereof may be connected with any other suitable means for transmitting power or holding a tool.

In operation steam, compressed air or other fluid under pressure is supplied to passage 4 through pipes threaded into openings 5 and causes the rotation of shaft 7. The arrangement is such, that as each piston blade 9 passes one of the admission ports 11 the corresponding set of admission recesses 16 pass into communication with said port, thus supplying actuating fluid to the space behind said blade, and admission will continue until the rearward end of the rearward recess 16 passes the corresponding admission port. Were a single recess 16 employed of a length equal to the combined effective lengths of the two recesses in a set, the corresponding admission port 11 would be thrown into communication with the adjacent exhaust port 17, and to obviate this difficulty and to still obtain prolonged admission, I make each of the recesses 16 shorter in length and space one of them in circumferential advance of the other. As each blade 9 passes the corresponding port 11, the corresponding passage 15 passes into communication with the corresponding recess 12 and thus admitting high pressure thereto behind the corresponding piston blade, thus forcing and holding said blade into contact with the inner periphery of casing 1. After the next succeeding blade has passed the corresponding port 11 and

admission is taking place behind the same, the preceding blade passes the corresponding exhaust port 17 permitting exhaust, the recesses 18 permitting the continuation of this exhaust until the corresponding blade has ridden well up on the corresponding abutment and the actuating fluid substantially all exhausted. If desired, the handles on the casing 1 may be dispensed with and said casing secured in permanent position.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a rotary engine, the combination of an outer casing having an interior piston chamber and an annular supply passage surrounding said chamber; two diametrically disposed abutments arranged on the inner periphery of said chamber, each of said abutments being provided with an admission port passing therethrough adjacent the rearward end thereof with reference to the direction of rotation to said passage and a centrally disposed recess in its face extending from said port to the forward end thereof with reference to the direction of rotation; a rotary piston in said chamber and provided with sets of symmetrically arranged admission recesses in its outer periphery, each set comprising two laterally spaced recesses one of which is arranged in circumferential advance of the other; radially slidable piston blades arranged between said sets of admission recesses, there being a passage connecting the inner end of said pistons with the central periphery thereof at a point to the rear of the corresponding piston blade; and exhaust ports for said chambers arranged adjacent the forward ends of said abutments, substantially as described.

2. In a rotary engine, the combination of an outer casing having an interior piston chamber and an annular supply passage surrounding said chamber; two diametrically disposed abutments arranged on the inner periphery of said chamber, each of said abutments being provided with an admission port passing therethrough adjacent the rearward end thereof to said passage and a centrally disposed recess in its face extending from said port to the forward end thereof; a rotary piston in said chamber and provided with five sets of symmetrically arranged admission recesses in its outer periphery, each set comprising two laterally spaced recesses one of which is arranged in circumferential advance of the other; five radially slidable piston blades arranged in said piston between said sets of admission recesses, there being a passage connecting the inner end of each of said pistons with the central periphery thereof at a point to the rear of the corresponding piston blade; and exhaust ports for said chambers arranged adjacent the forward ends of said abutments, substantially as described.

3. In a rotary engine, the combination of an outer casing having an interior piston chamber and an annular supply passage surrounding said chamber; two diametrically disposed abutments arranged on the inner periphery of said chamber, each of said abutments being provided with an admission port passing therethrough adjacent the rearward end thereof to said passage and a centrally disposed recess in its face extending from said port to the forward end thereof, the rear ends of said abutments being made sloping; a rotary piston in said chamber and provided with five sets of symmetrically arranged admission recesses in its outer periphery, each set comprising two laterally spaced recesses one of which is arranged in circumferential advance of the other; five radially slidable piston blades arranged in said piston between said sets of admission recesses, there being a passage connecting the inner end of each of said pistons with the central periphery thereof at a point to the rear of the corresponding piston blade; and exhaust ports for said chambers arranged adjacent the forward ends of said abutments, there being recesses formed in the inner walls of said casing leading from said exhaust ports toward said abutments, substantially as described.

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

ANDREW McCORMICK.

Witnesses:
ARTHUR O. OLSON,
JOSHUA R. H. POTTS.