

(No Model.)

2 Sheets—Sheet 1.

F. MEYER.
ROTARY STEAM ENGINE.

No. 464,285.

Patented Dec. 1, 1891.

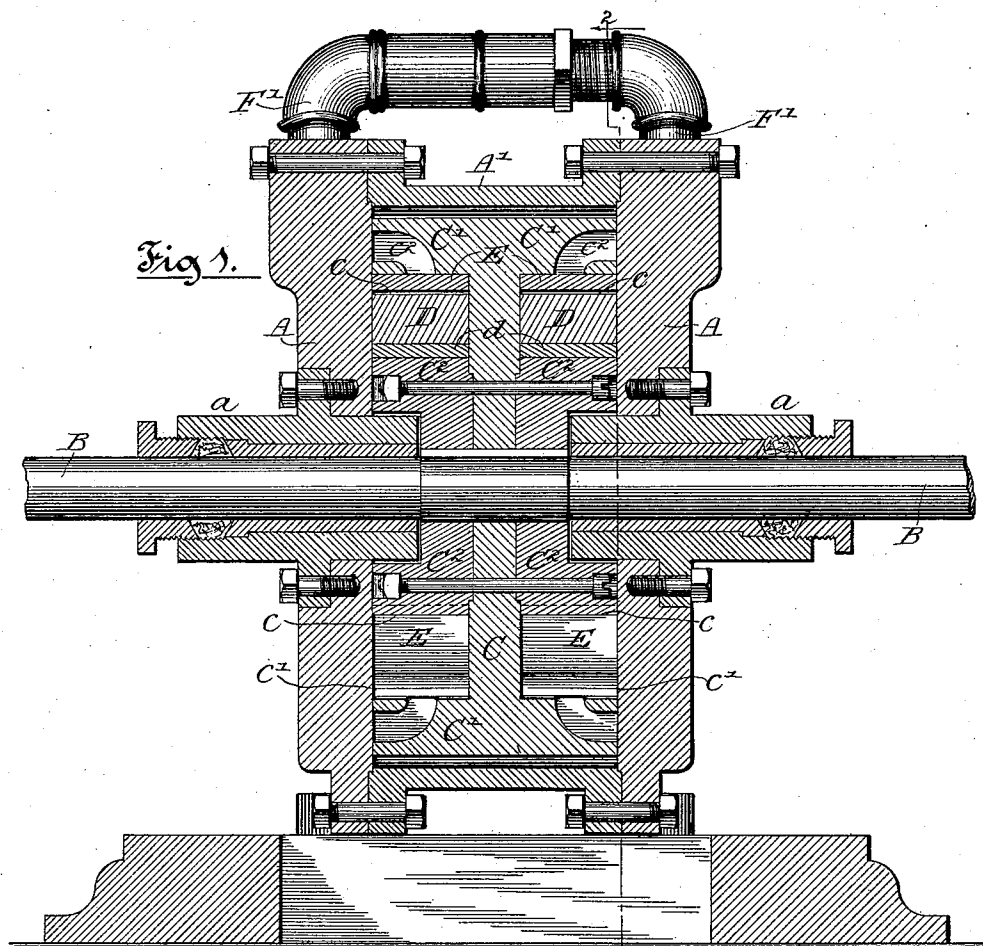
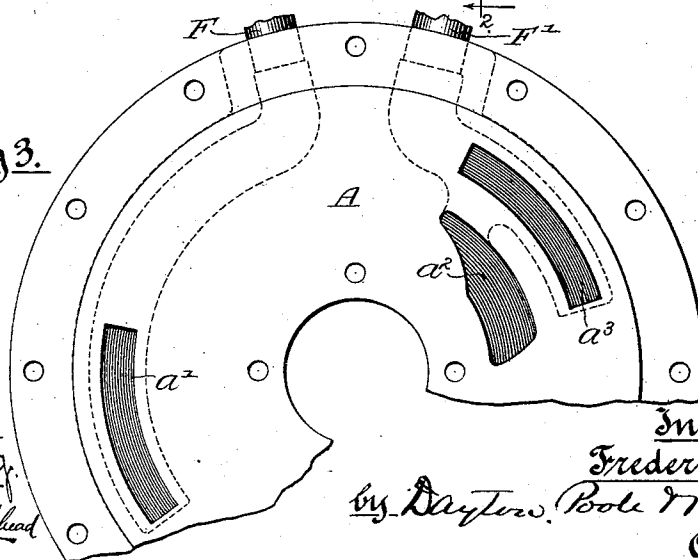


Fig 3.



Witnesses

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Inventor

Frederick Meyer

by Dayton, Poole & Brown,

Attorneys.

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Fig 2.

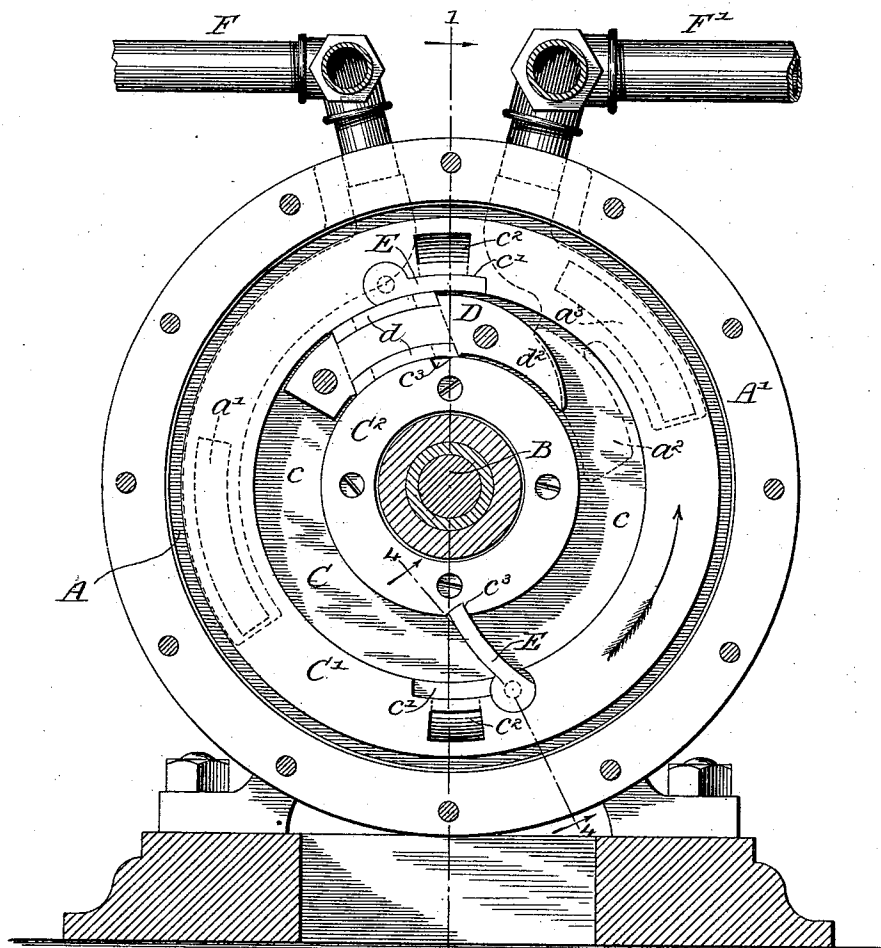
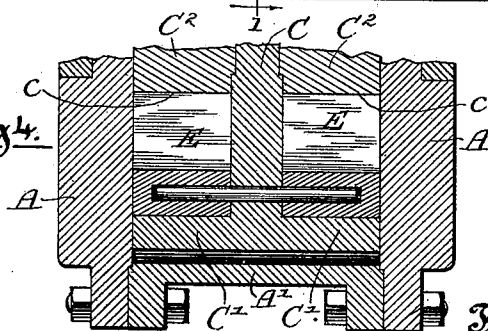


Fig 4.



Witnesses

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UNITED STATES PATENT OFFICE.

FREDERICK MEYER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE DUPLEX
ROTARY ENGINE COMPANY, OF SAME PLACE.

ROTARY STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 464,285, dated December 1, 1891.

Application filed October 7, 1890. Serial No. 367,316. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK MEYER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Rotary Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked
10 thereon, which form a part of this specification.

This invention has for its object to provide an improved construction in rotary steam-engines of the general character set forth in the
15 application for patent, Serial No. 306,229, filed April 6, 1889, and renewed January 25, 1890, and in the application, Serial No. 331,980, filed November 29, 1889, by myself jointly with Joseph S. Kiehl and Alexander Grant.
20 The invention herein set forth has more especial reference to features of construction relating to the pistons and their mode of operation.

The nature of the invention will appear
25 from the following description of the accompanying drawings, in which—

Figure 1 is an axial section on the line 1 1 of Fig. 2, the shaft being shown in side elevation. Fig. 2 is a vertical section transverse
30 to the shaft on the line 2 2 of Fig. 1, looking in the direction of the arrow applied to said line. Fig. 3 is a view of the inner face of one of the side plates of the engine-shell. Fig. 4 is a fragmentary transverse section in the
35 indirect line 4 4 of Fig. 2.

The engine, as illustrated, is of the double or duplex form pointed out in the above-mentioned application, Serial No. 331,980; but obviously the improvements may be applied to
40 the single form.

A A are two parallel side plates bolted to an intermediate annular and circumferential plate A', said plates A A and A' forming a
45 shell having a cylindric interior and embracing the rotary parts of the engine.

Through bearings *a* in the side plates A A passes a shaft B, and to this shaft is keyed a disk C, having on each side thereof an annular groove *c*, embraced between parallel
50 walls or flanges C' C', the edges of which run in contact with the side plates A A. As here

shown, the outer flanges C' C' are formed integral with the disk C, while the inner flanges C² C² are made separate and bolted to the disk, as indicated in Figs. 1 and 2.

To the stationary side plates A A are attached abutment-blocks D D, one fitted to each of the grooves *c c* in the disk C, and filling said groove either by being made originally of the proper size for this purpose or
60 by means of packing devices applied thereto, as indicated at *d d*.

To one of the flanges on each side of the disk C are hinged pistons E E, adapted to fold back into recesses *c'* in the flange to which
65 they are hinged, in order that they may pass the abutment-blocks, and also adapted to swing in the opposite direction after passing said abutment-blocks, so as to lie across the grooves *c c*. As a preferred construction, said
70 pistons are shown in the present drawings hinged to the outer of the two flanges or to the flange C'. The disk C, having the pistons hinged thereto as described, can obviously rotate only one way, the direction of
75 rotation being indicated in Fig. 2 by the arrow applied to the outer flange C'. To favor the retraction of the pistons E, the end *d*² of the abutment-block D, which said pistons approach in the revolution of the disk, is given
80 an inclined outer surface, as shown in Fig. 2. Steam is admitted to the space between the abutment-block D and a piston which has advanced beyond said block and been thrown across the groove *c* in the manner indicated
85 in a prior application filed by me September 16, 1890, and serially numbered 365,136, with reference to the use of the steam expansively—that is to say, the steam instead of being admitted through the shell directly into the groove
90 *c*, as indicated in the first-mentioned two applications for patent, is first conducted from a passage in the shell into a port formed in the body of the disk and thence into the groove *c*. Two such ports in each side of the
95 disk are shown at *c*² *c*², Figs. 1 and 2, the outer ends of said ports being in the side faces of the flanges C' and the inner ends opening into the recesses *c'* behind or beneath the pistons E. The steam reaches these ports *c*²
100 from the supply-pipe F through passages *a'*, cored in the side plates A A and opening at

their inner ends against the side faces of the flange C' in line with the ports c^2 , so that steam will enter the groove c only during the brief arc of coincidence of said ports a' and c^2 . The steam entering said ports forces the pistons E inwardly across the groove c , and then by acting to expand the spaces between said pistons and the abutment-blocks produces the revolution of the disk C and the shaft B. The steam acts at full pressure for this purpose only during the period of coincidence between the ports a' and c^2 and thereafter acts expansively. There may be any desired number of the pistons E, two being sufficient, however, to give one piston always in proper position to receive the pressure of the steam.

The exhaust-pipe F' communicates directly with the groove or space c through a cored passage a^3 in the side face of the shell, as illustrated in full lines in Fig. 3 and in dotted lines in Fig. 2. This exhaust may be located in any position to begin to release the steam back of one of the pistons after another piston shall have been brought into position to take steam-pressure. As here shown, it is located adjacent to the abutment-block D. The cored exhaust-passage has another opening a^3 opposite the flange C' and in position to coincide with the port c^2 , in order that said port may be relieved from steam-pressure more or less perfectly and the piston E allowed to freely fold outward into the recess c' or in position to pass the abutment-block. As a desirable construction, the flange C² is

provided with notches c^3 to receive the free ends of the pistons E and afford a fair bearing-support for said pistons.

I here claim as my invention—

1. The combination of the grooved revolving disk, a stationary abutment-block in the groove, and a vibrating piston, the disk being provided with a port for the admission of steam opening into the groove behind the retracted piston and extending thence to the side face of the disk outside the groove, and a shell provided with an inlet-port opposite the side face to coincide at suitable intervals with the port therein, substantially as described.

2. The combination of the shell and revolving grooved disk provided with vibrating pistons intercepting the groove and adapted to be retracted out of the groove and a stationary abutment-block in the groove, the shell being provided with an inlet-port opening opposite a side face of the disk and with an exhaust-port opening, both opposite the same side face of the disk and also opposite the groove of the disk, and said disk having an inlet-port leading from the side of the disk into the groove, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

FREDERICK MEYER.

Witnesses:

M. E. DAYTON,
TAYLOR E. BROWN.