No. 711,600. Patented Oct. 21, 1902.

M. W. WALLACE.

ROTARY ENGINE.

(Application filed Feb. 24, 1902.)

(No Model.) 3 Sheets—Sheet 1.

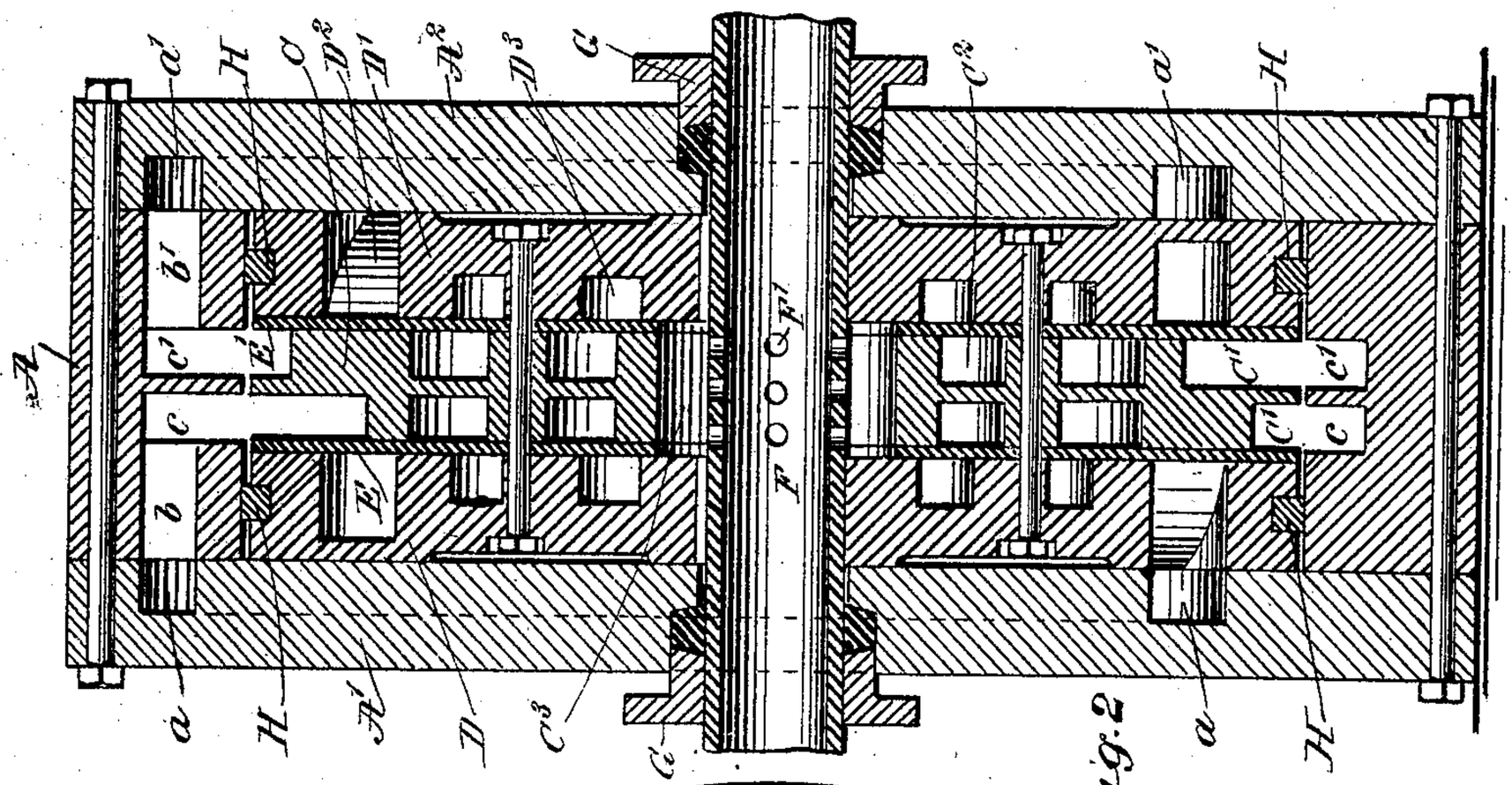

Fig. 2

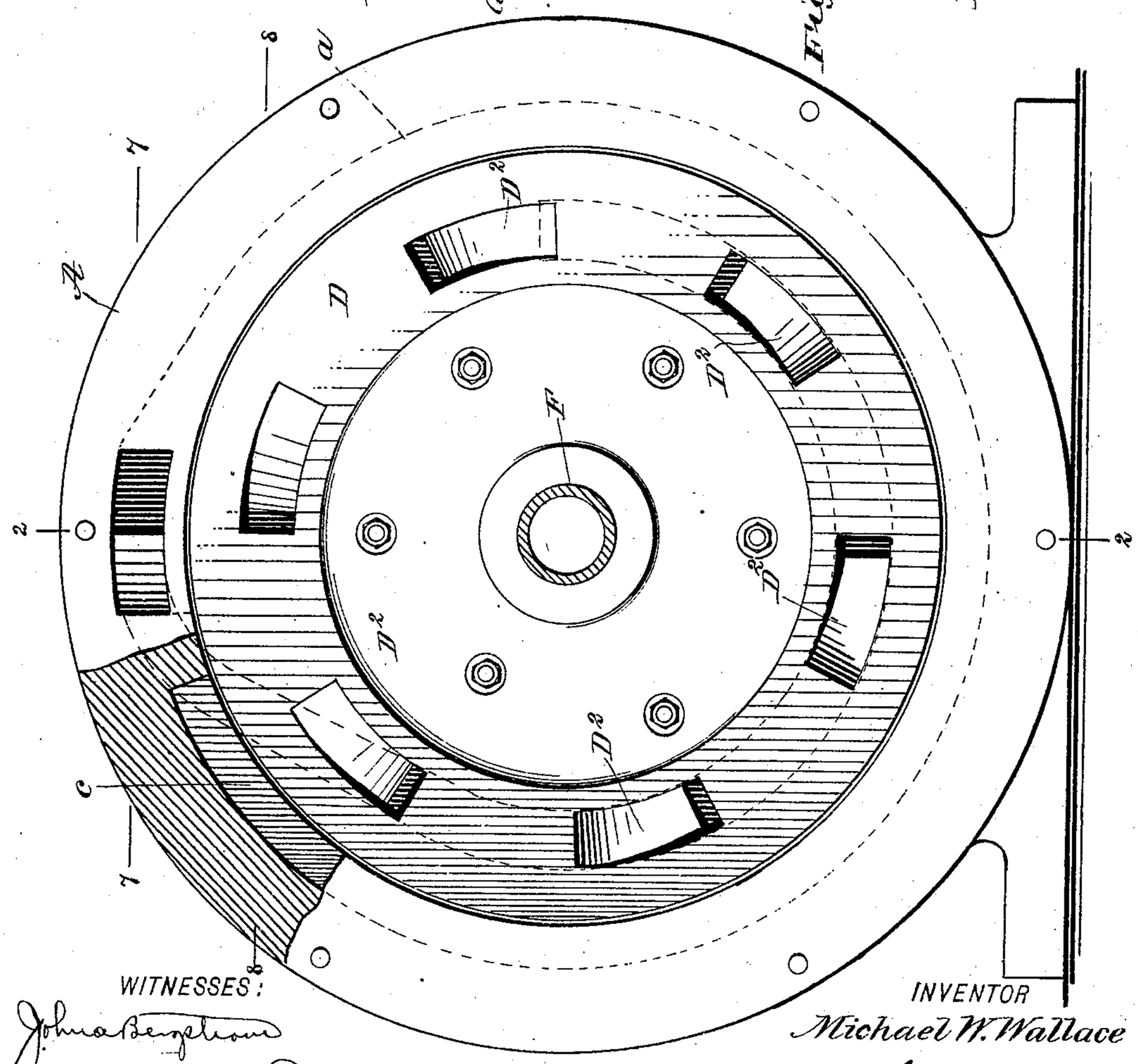

Fig. 1

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Fig. 4

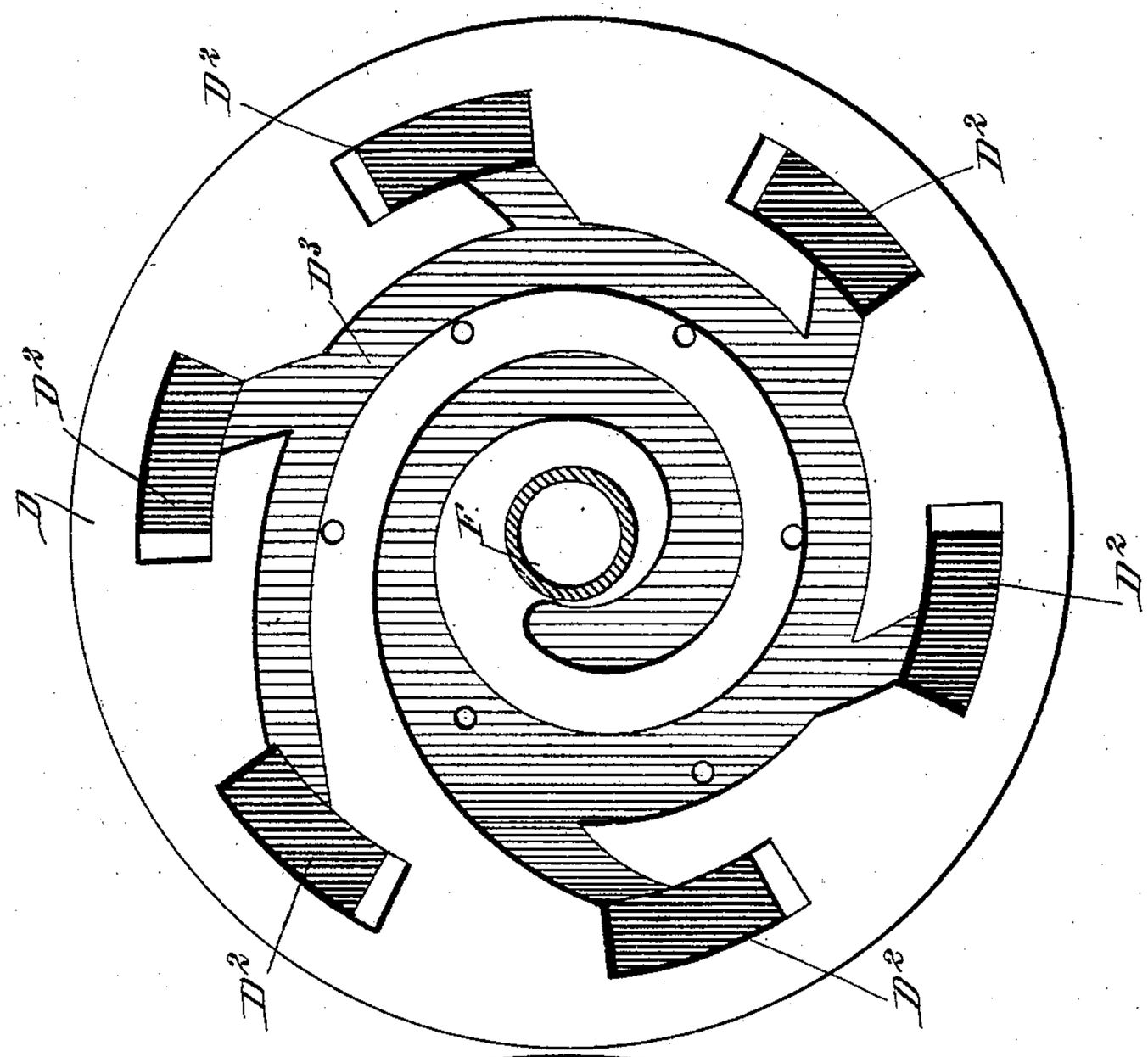

Fig. 3

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Fig. 4

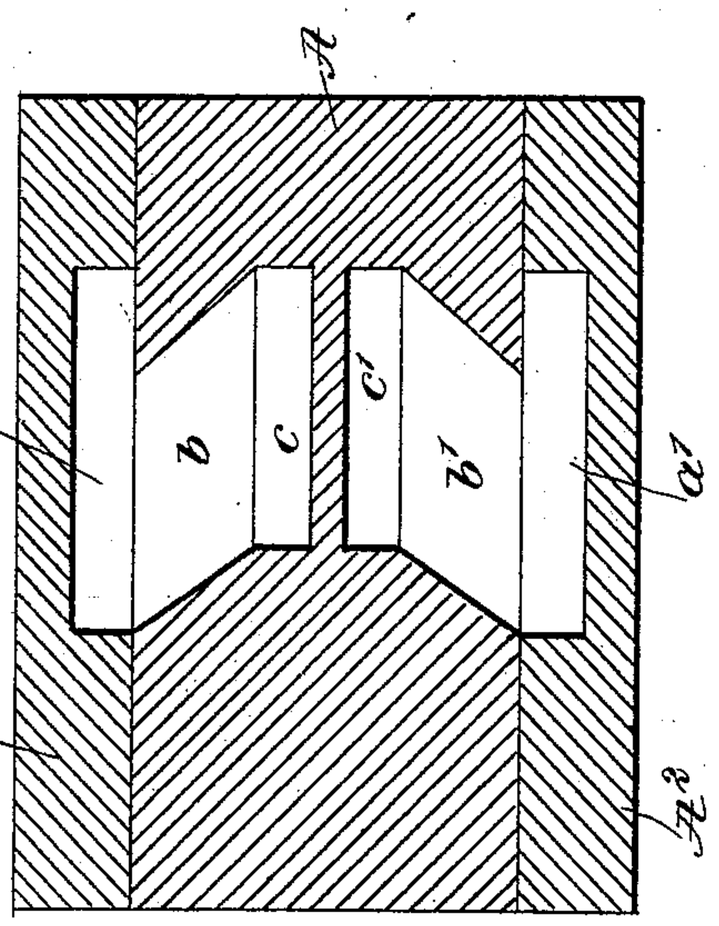


Fig. 8

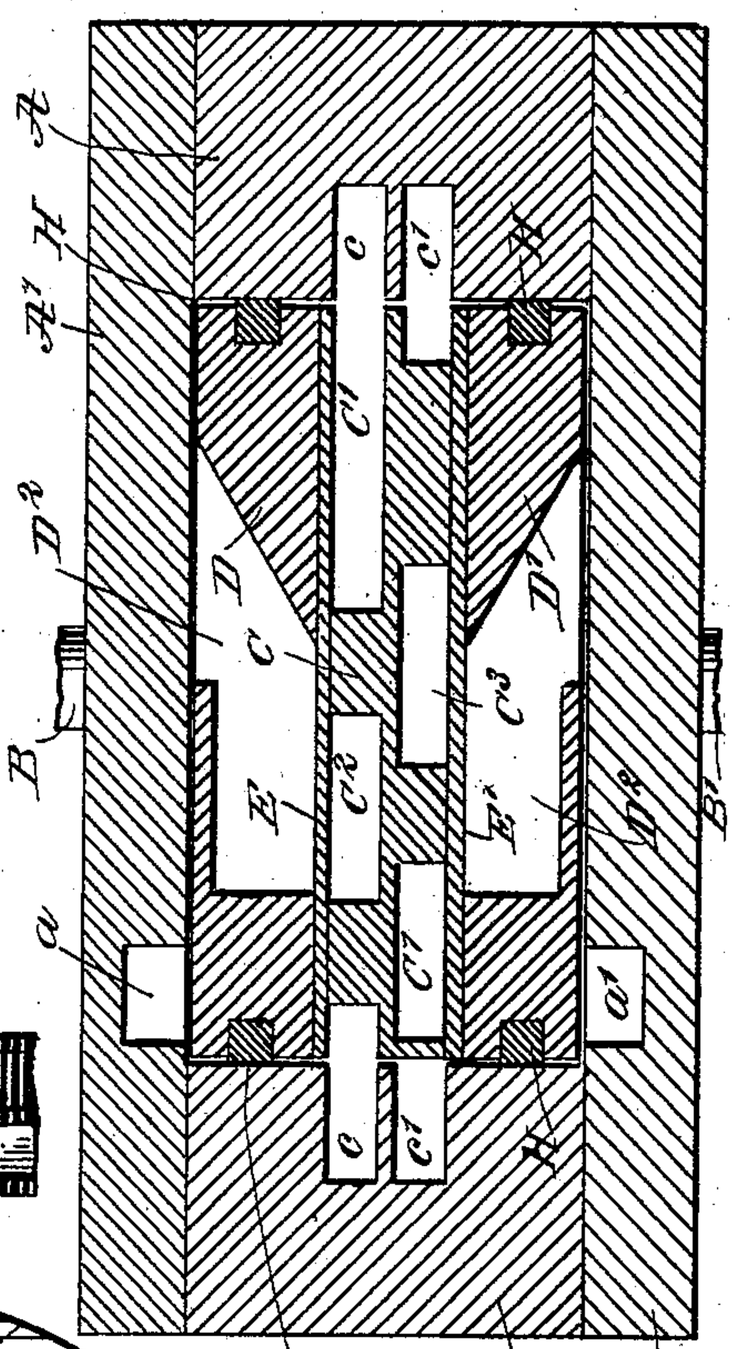


Fig. 6

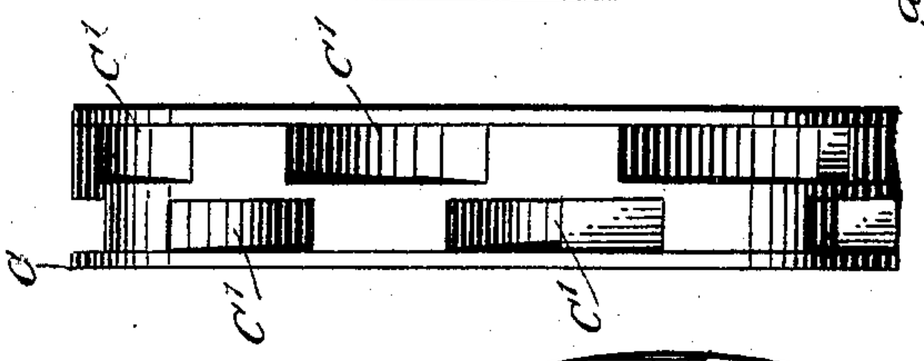
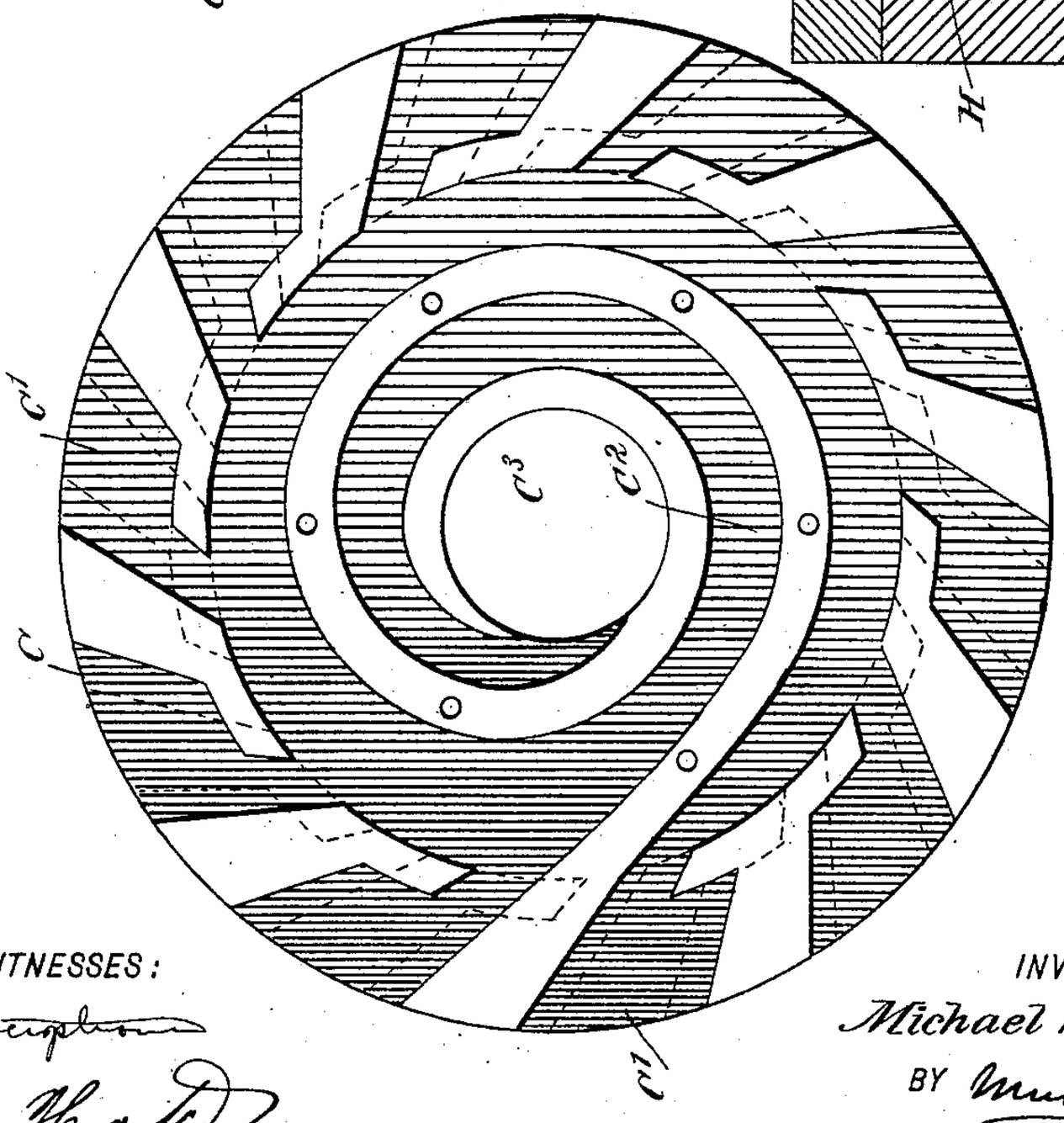


Fig. 5



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UNITED STATES PATENT OFFICE.

MICHAEL WALTER WALLACE, OF EVELETH, MINNESOTA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 711,600, dated October 21, 1902.

Application filed February 24, 1902. Serial No. 95,269. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL WALTER WALLACE, a citizen of the United States, and a resident of Eveleth, in the county of St. Louis and State of Minnesota, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved rotary engine which is simple and durable in construction, very effective in operation, and arranged to utilize the motive agent to the fullest advantage.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in 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 face view of the improvement, one of the cylinder-heads being removed and parts being shown in section. Fig. 2 is a sectional elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is an inner face view of one of the cylinder-heads. Fig. 4 is a face view of the inner side of one of the outer sections of the wheel. Fig. 5 is a face view of the central section of the wheel. Fig. 6 is an edge view of the same. Fig. 7 is a sectional plan view of the improvement on the line 7 7 of Fig. 1, and Fig. 8 is a similar view of the same on the line 8 8 of Fig. 1.

The cylinder A of the engine is provided with the cylinder-heads A′ A^2, connected by supply-pipes B B′ with a steam-boiler or other source of motive-agent supply, and in the said cylinder is mounted to rotate a wheel, consisting of a central section C and outer or side sections D D′, separated from the central section C by disks E E′, as plainly indicated in Figs. 2 and 8.

The wheel is secured by its outer sections D D′ to the main shaft F, journaled in suitable bearings G, carried by the cylinder-heads A′ A^2, and the said shaft F is preferably made hollow to serve as an exhaust for the motive agent, as hereinafter more fully described.

The cylinder-heads A′ and A^2 are alike in construction and are formed on their inner faces with feed-grooves *a a′*, connecting at one end with the supply-pipes B B′ and opening at their other ends into ports *b b′*, (see Fig. 7,) leading to feed-grooves *c c′*, formed on the inside of the cylinder-rim and arranged one alongside the other, with a partition between the two, as plainly indicated in Figs. 2, 7, and 8. The annular feed-grooves *c c′* open into sets of buckets C′, formed on the periphery of the central section C, the said buckets being in two sets, as indicated in full and dotted lines in Fig. 5 and in full lines in Fig. 6, and each set of buckets opens into a spiral groove C^2, formed in the corresponding face of the central section, the inner ends of both spiral grooves opening into an exhaust-chamber C^3, surrounding the middle portion of the shaft F, which is provided at this point with perforations F′, opening into the exhaust-chamber.

The feed-grooves *a a′* in the cylinder-heads have a portion thereof segmental, as indicated in Fig. 3, and this segmental portion registers with the chambers D^2, formed in the web of the outer sections D D′, respectively, so that live steam can pass into the said chambers as the wheel rotates. The chambers D^2 connect at the inner faces of the sections D D′ with spiral grooves D^3, leading at their inner ends to the openings in the disks E E′ to connect with the exhaust-chamber C^3, formed annularly around the middle portion of the shaft F, by the central section C.

In order to prevent leakage of steam between the wheel and the rim of the cylinder, I provide the peripheral faces of the outer sections D and D′ with suitable packing-rings H, abutting against the inner face of the rim of the cylinder A.

The operation is as follows: The live steam passing through the pipes B B′ into the feed-grooves *a a′* is conducted by the latter into the feed-grooves *c c′* and into the chambers D^2 in the two outer sections D D′ of the wheel, the steam from the feed-grooves *c c′* passing into the sets of buckets C′ and then into the spiral groove C^2 to give an impulse to the central section to rotate the wheel. At the same time the steam passing into the chambers D^2 to the spiral groove D^3 gives impulse to the outer sections D D′ of the wheel, so that the latter is rotated with the full force of the

steam, the steam finally passing from the several spiral grooves to the exhaust-chamber C^3 and then through the perforations F′ into the main shaft F, to be conducted to a condenser or to other machines to be driven by the exhaust-steam.

It will be seen that by the arrangement described the steam acts both on the central and outer sections of the wheel and works expansively thereon, so that the motive agent is utilized to the fullest advantage.

It is understood that as the motive agent first acts on the sections of the wheel C at or near the outer ends thereof the greatest leverage is obtained, the latter decreasing as the steam travels along the spiral grooves to the exhaust-chamber, and the pressure of the steam diminishes correspondingly.

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

1. A rotary engine comprising a cylinder, a wheel mounted to rotate therein and having a plurality of sections formed with spiral grooves connecting at their outer ends with steam-feed grooves in the said cylinder and its heads, and a main shaft mounted to turn and carrying the said wheel, the said shaft having perforations opening into an exhaust-chamber arranged centrally in the wheel, and into which chamber the spiral grooves open, as set forth.

2. A rotary engine comprising a cylinder, a wheel mounted to rotate therein and having a plurality of sections formed with spiral grooves connecting at their outer ends with steam-feed grooves in the said cylinder and its heads, and a main shaft mounted to turn and carrying the said wheel, the said shaft being made hollow to form an exhaust for the motive agent, the shaft receiving the exhaust from the inner ends of the spiral grooves, as set forth.

3. A rotary engine comprising a cylinder having feed-grooves on the inside of its rim and feed-grooves at the inner faces of the cylinder-heads, the cylinder-head feed-grooves being connected with the motive-agent supply and in communication with the said rim feed-grooves, a wheel mounted to turn in the said cylinder, having a plurality of sections formed with spiral grooves connecting at their outer ends with the said steam-feed grooves in the cylinder and heads, and a main shaft mounted to turn and carrying the said wheel, the said shaft having perforations opening into an exhaust-chamber arranged centrally on the wheel, and into which chamber the spiral grooves open, as set forth.

4. A rotary engine comprising a cylinder having feed-grooves on the inside of its rim and feed-grooves at the inner faces of the cylinder-heads, the cylinder-head feed-grooves being connected with the motive-agent supply and in communication with the said rim feed-grooves, and a wheel mounted to rotate in the said cylinder, having its central section formed with buckets and spiral grooves, the buckets opening into the rim feed-grooves, the wheel also having outer sections formed with chambers and spiral feed-grooves, of which the chambers connect with the feed-grooves in the cylinder-heads, as set forth.

5. A rotary engine comprising a cylinder having feed-grooves on the inside of its rim and feed-grooves at the inner faces of the cylinder-heads, the cylinder-head feed-grooves being connected with the motive-agent supply and in communication with the said rim feed-grooves, and a wheel mounted to rotate in the said cylinder, having its central section formed with buckets and spiral grooves, the buckets opening into the rim feed-grooves, the wheel also having outer sections formed with chambers and spiral feed-grooves, of which the chambers connect with the feed-grooves in the cylinder-heads, the said wheel also having a central exhaust-chamber into which open the said spiral grooves, as set forth.

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

MICHAEL WALTER WALLACE.

Witnesses:
JOHN JENNINGS,
THOMAS GAILE.