

(No Model.)

W. WILLERTON & T. SHORTLIFF.
ROTARY ENGINE.

No. 604,641.

Patented May 24, 1898.

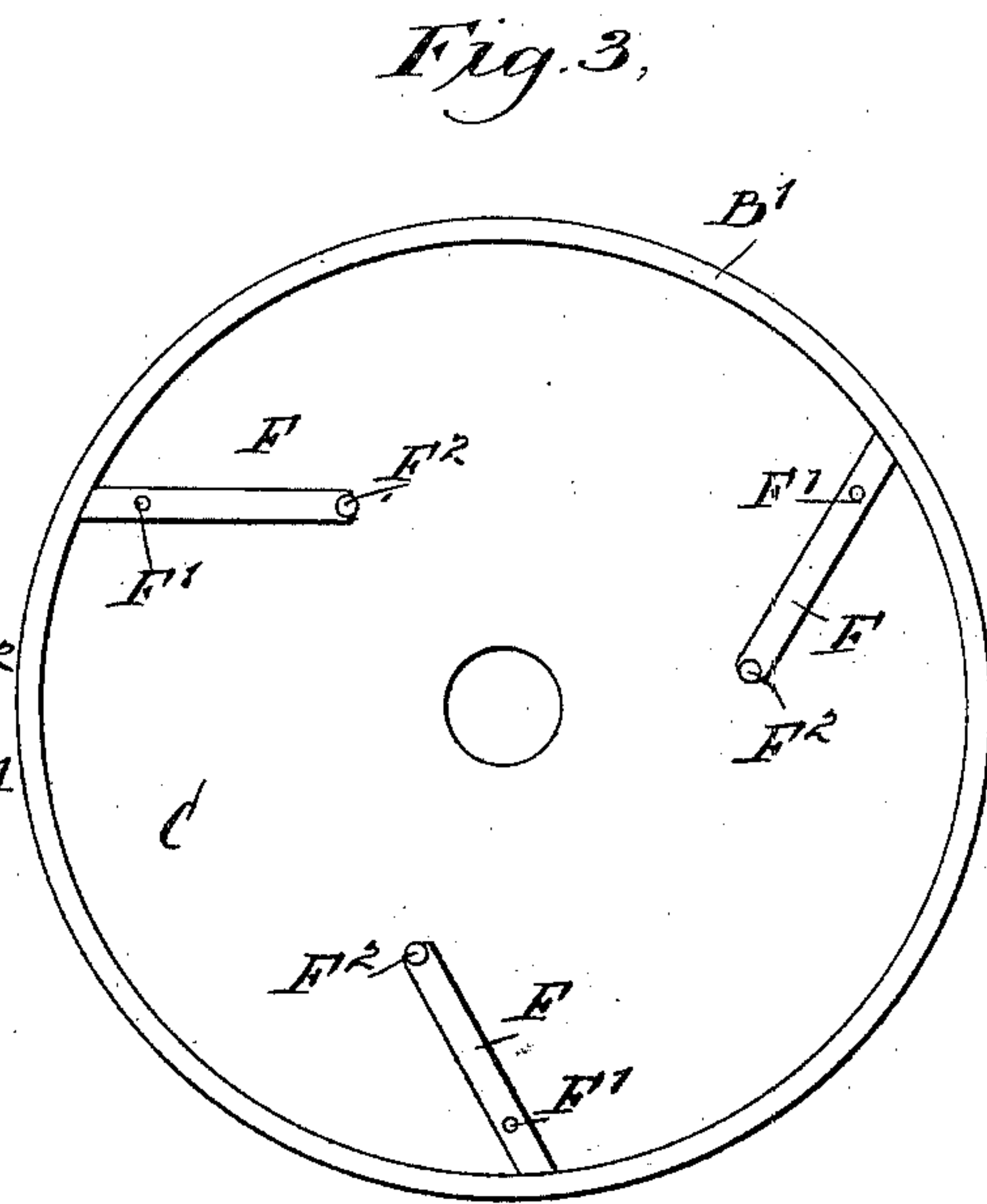
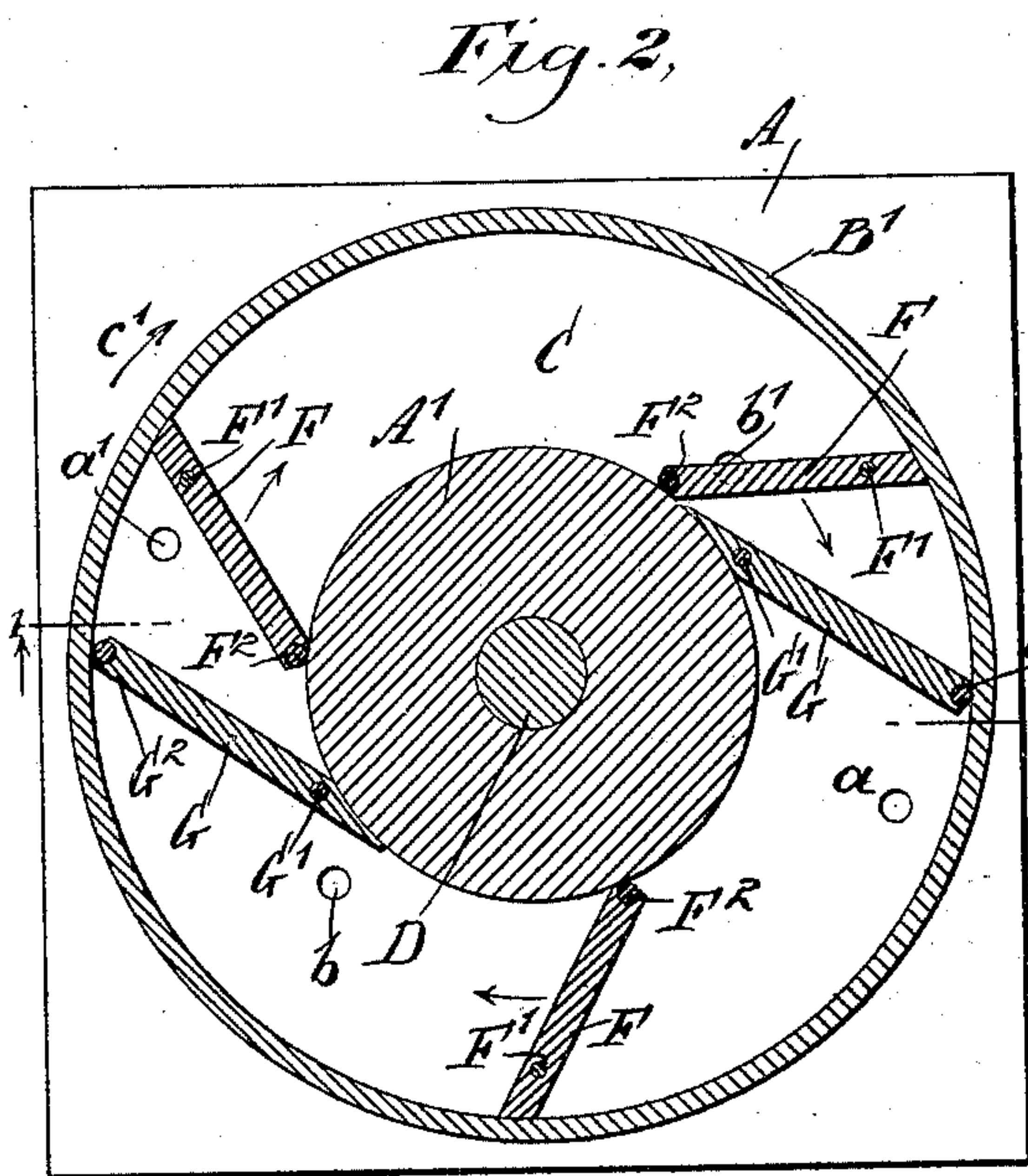
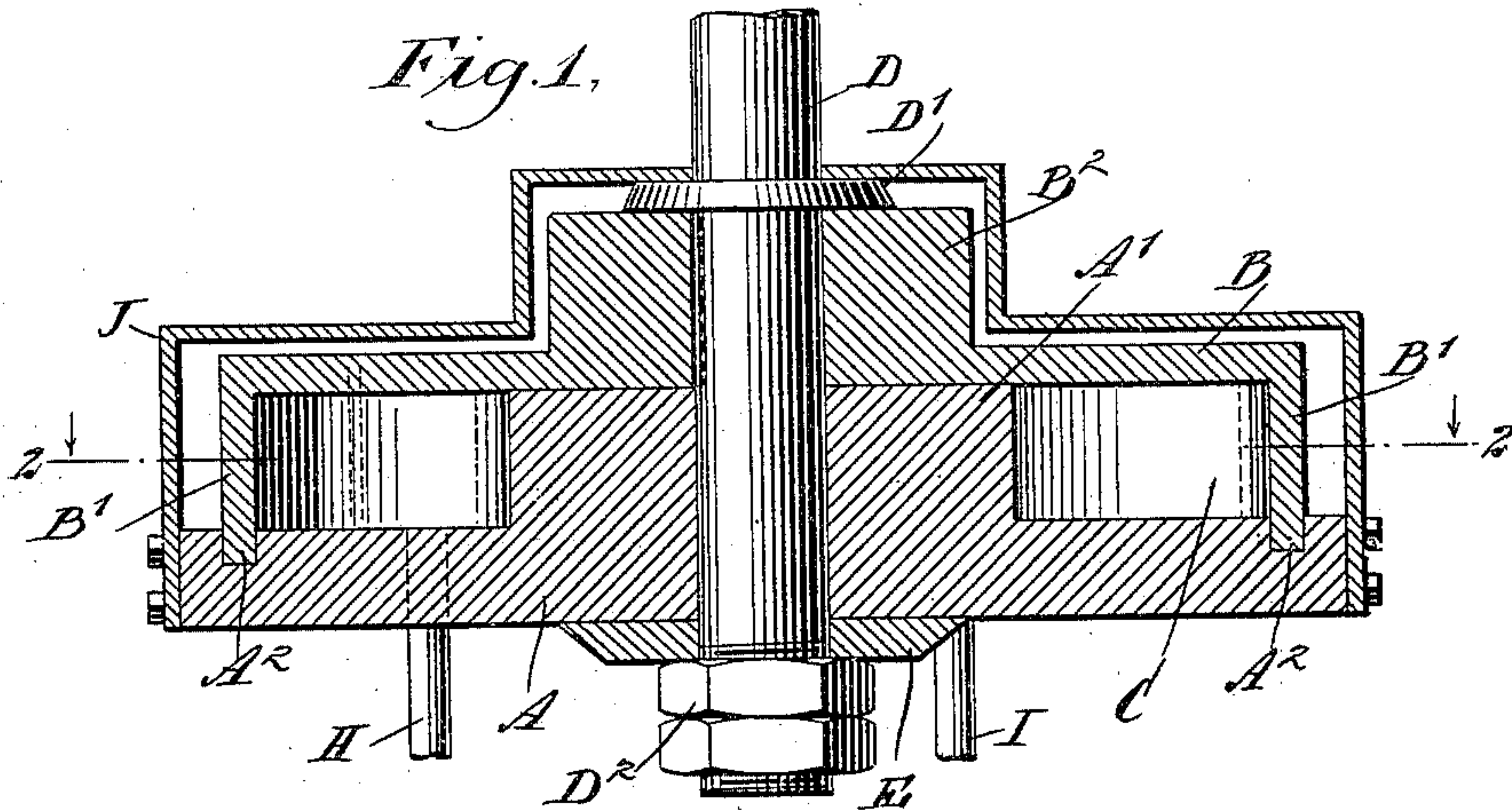
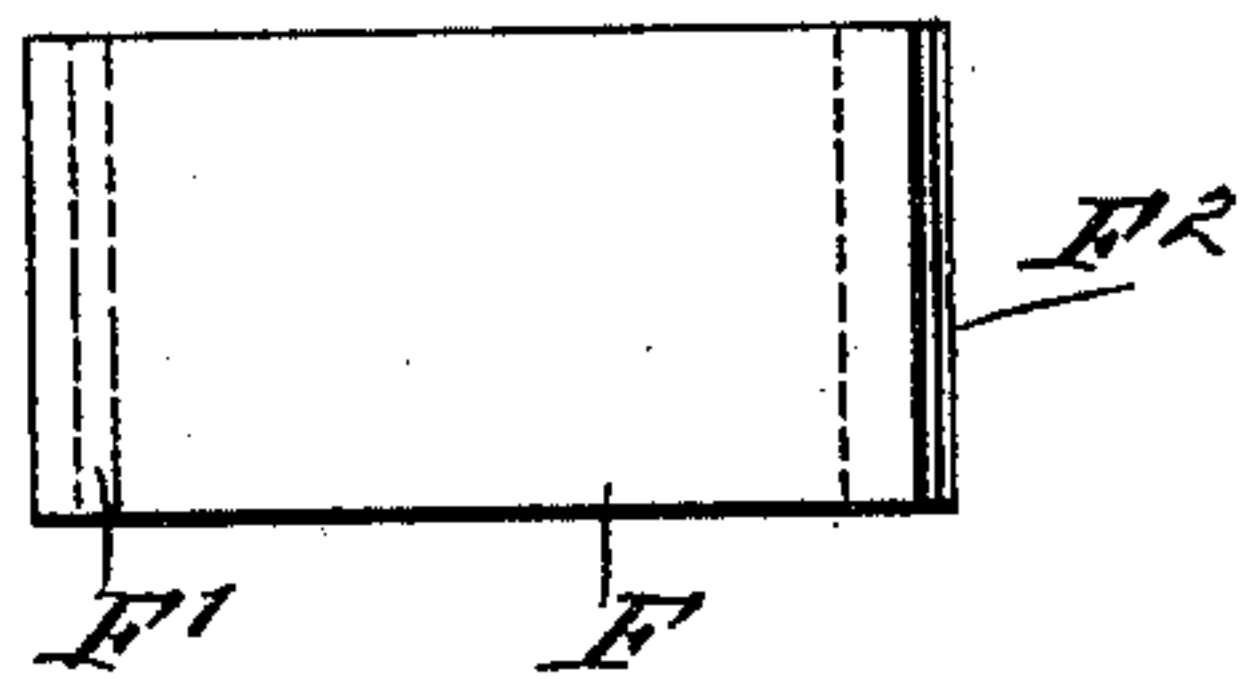


Fig. 4.



WITNESSES:

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WILLIAM WILLERTON AND THOMAS SHORTLIFF, OF KIPP, MONTANA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 604,641, dated May 24, 1898.

Application filed July 27, 1897. Serial No. 646,084. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM WILLERTON and THOMAS SHORTLIFF, of Kipp, in the county of Teton and State of Montana, have
5 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
10 motive agent to the fullest advantage.

The invention consists principally of a casing provided with pivoted abutments and a revoluble piston in the form of a wheel and forming, with the said casing, an annular working chamber for the motive agent and piston-heads pivoted on the web of the said wheel and traveling on the inner wall of the said
15 chamber.
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The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

25 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 figures.

Figure 1 is a sectional plan view of the improvement on the line 1 1 of Fig. 2. Fig. 2 is a sectional side elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a face view of the revoluble piston and piston-heads, and Fig. 4 is a plan view of one of the abutments.

35 The improved rotary engine illustrated in the drawings is provided with a casing A, formed on one face with a hub A', against which abuts the central portion of a piston B, made in the form of a wheel having a solid
40 web, and a rim B', concentric to the hub A' and fitting with its outer edge into an annular groove A², formed on the inner face of the casing A. By the arrangement described the piston B forms, with the casing A, an annular
45 working chamber C, of which the outer wall is the rim B' and the inner wall is formed by the hub A'.

The piston B is secured on a shaft D, mounted to rotate in the hub A' of the casing, and
50 on the said shaft is secured or formed a collar D', engaging the hub B² of the said piston B to hold the latter against the hub A'. Nuts

D² screw on the outer end of the shaft D to abut against a washer E, held on the outer face of the casing A. The shaft D is provided with the usual means for transmitting
55 the rotary motion of the engine to other machinery.

In the working chamber C extend a series of piston-heads F, pivoted near their outer ends at F' to the web of the piston B, the inner ends of the said piston-heads being provided with friction-rollers F², traveling on the peripheral surface of the hub A'. Abutments G also extend into the annular working chamber C and are pivoted near their inner ends at G' on the stationary hub A', while their outer ends carry friction-rollers G², traveling on the inner surface of the rim B' of the piston B.
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As shown in Fig. 2, three piston-heads F are employed to two abutments G, the said abutments and piston-heads being so arranged that when the piston rotates the piston-heads F swing outwardly, while the abutments G swing inwardly to allow the piston-heads to pass the abutments.
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Into the annular chamber C open diametrically-arranged inlet-ports a a', formed in the casing A and connected with steam-supply pipes H, and exhaust-ports b b' likewise open into the chamber C and are connected at their outer ends with exhaust-pipes I. The inlet-ports a a' are located near the rim B', while the exhaust-ports b b' are located near the hub A', and the said ports are alternately arranged and placed suitable distances apart, as is plainly indicated in Fig. 2. Now by reference to the said figure it will be seen that the steam entering the port a presses the next piston-head F, with its friction-roller F², in engagement with the hub A', while the outer end of the said piston-head rests against the inner face of the rim B'. In a like manner the steam presses against the abutment G, so as to hold the friction-roller G² thereof in engagement with the inner face of the rim B'. Now the pressure of steam on the abutment F imparts a traveling motion to the piston B, so as to rotate the same in the direction of the arrow c', and at the same time a similar impulse is given to the piston B by the steam passing through the port a' into the space between the corresponding abutment
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G and piston-head F. When the forwardly-moving piston-head F passes the next exhaust-port b or b' , then the steam in the rear of the said piston-head can exhaust, it being understood that in the meanwhile another piston-head has passed the preceding inlet-port. Thus continuous impulses are given to the piston-head B by the steam pressing at all times against some of the piston-heads to insure a continuous rotary motion of the piston. The rotating piston B is preferably enclosed in a suitable J, attached to the casing A, as indicated in Fig. 1.

It is understood that when a piston-head F passes an abutment G then the latter yields inwardly against the pressure of the exhaust-steam contained between the next piston-head and the said abutment; but as soon as the piston-head F has passed such abutment and the corresponding inlet-port then the steam from the latter will act at once on both the abutment and the piston-head, so as to move them into their proper positions—that is, with their friction-rollers F^2 and G^2 against the hub A' and the rim B' , respectively.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. A rotary engine, comprising a casing formed with a hub and having pivoted abutments, a revoluble piston in the form of a wheel having a rim concentric to the hub of the casing and forming with the said hub an annular working chamber, the said abutments being pivoted near their inner ends and each having a heel at said end adapted to rest against the inner wall or hub, the outer ends of said abutments being adapted to travel on the inner surface of the said rim, and piston-heads pivoted near their outer ends on the web of the said wheel, the inner ends of the said piston-heads being adapted to travel on the peripheral surface of the hub, substantially as described.

2. A rotary engine, comprising a casing formed on one face with a hub, the said casing having inlet and exhaust ports alternately arranged, a piston mounted to turn and having its central portion engaging the said hub of the casing, the piston having a solid web and a rim concentric to the said hub of the casing and having its outer edge fitted to turn in an annular groove formed on the inner face of the casing, thereby forming with the casing an annular working chamber, the said piston being provided with piston-heads pivoted near their outer ends to the web of the said piston and mounted to swing in the said chamber, the inner ends of the said piston-heads being provided with friction-rollers adapted to travel on the peripheral surface of the hub of the casing, and abutments pivoted near their inner ends to the hub of said casing at opposite points and normally extending tangentially therefrom, the said abutments being provided at their outer ends with friction-rollers arranged to travel on the inner surface

of the rim of the piston, the said abutments and piston-heads being so arranged that when the piston rotates the piston-heads swing outwardly while the abutments swing inwardly to allow the piston-heads to pass the abutments, substantially as set forth.

3. A rotary engine, comprising a casing, and a piston mounted to turn and forming with the said casing an annular working chamber and pivoted abutments and pivoted piston-heads within the working chamber and adapted to pass one another, the said abutments being pivoted near their inner ends to the inner fixed wall of said working chamber and provided with friction-rollers at their outer ends adapted to rest against the inner surface of the rim of the piston, and the said piston-heads being pivoted near their outer ends on the movable piston and having their inner ends provided with friction-rollers adapted to engage the inner fixed wall of the said working chamber, the said casing being provided with inlet-ports opening into the said annular chamber forward of said abutments, and outlet-ports leading from said annular chamber and located at the rear of said abutments, the inlet-ports being located near the outer wall of the annular chamber and the outlet-ports near the inner wall thereof, the said ports being alternately arranged, substantially as shown and described.

4. A rotary engine, comprising a casing, a piston mounted to turn and forming with the said casing an annular working chamber, abutments pivoted near their inner ends to the inner fixed wall of the chamber at opposite points and adapted to engage with their outer ends the inner surface of the rim of the piston, piston-heads pivoted near their outer ends to the movable piston and having their inner ends adapted to engage the inner fixed wall of the working chamber, the said casing being provided with oppositely-arranged inlet-ports opening into the said annular working chamber at a point forward of said abutments, the casing being also provided with oppositely-arranged outlet-ports opening into the annular chamber at the rear of the abutments, the said pivoted abutments and pivoted piston-heads being adapted to pass one another and arranged to be returned to their normal positions by pressure of the motive agent, substantially as set forth.

5. A rotary engine, comprising a casing, a revoluble piston forming with the said casing an annular working chamber, two oppositely-arranged abutments pivoted near their inner ends to the casing and resting with their inner ends against the inner wall of the chamber, the said abutments carrying friction-rollers at their outer ends adapted to rest against the rim of the piston, the said abutments normally extending tangentially from the inner wall of the annular working chamber and in opposite directions, piston-heads pivoted near their outer ends on the web of the piston and adapted to rest with their outer

ends against the rim of the piston and their inner ends on the inner wall of the chamber, the piston-heads being three in number, the said casing being provided with diametrically-
5 arranged inlet-ports opening into the annular working chamber forward of the said abutments, and outlet-ports opening into said

chamber at the rear of said abutments, substantially as set forth.

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Witnesses:

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