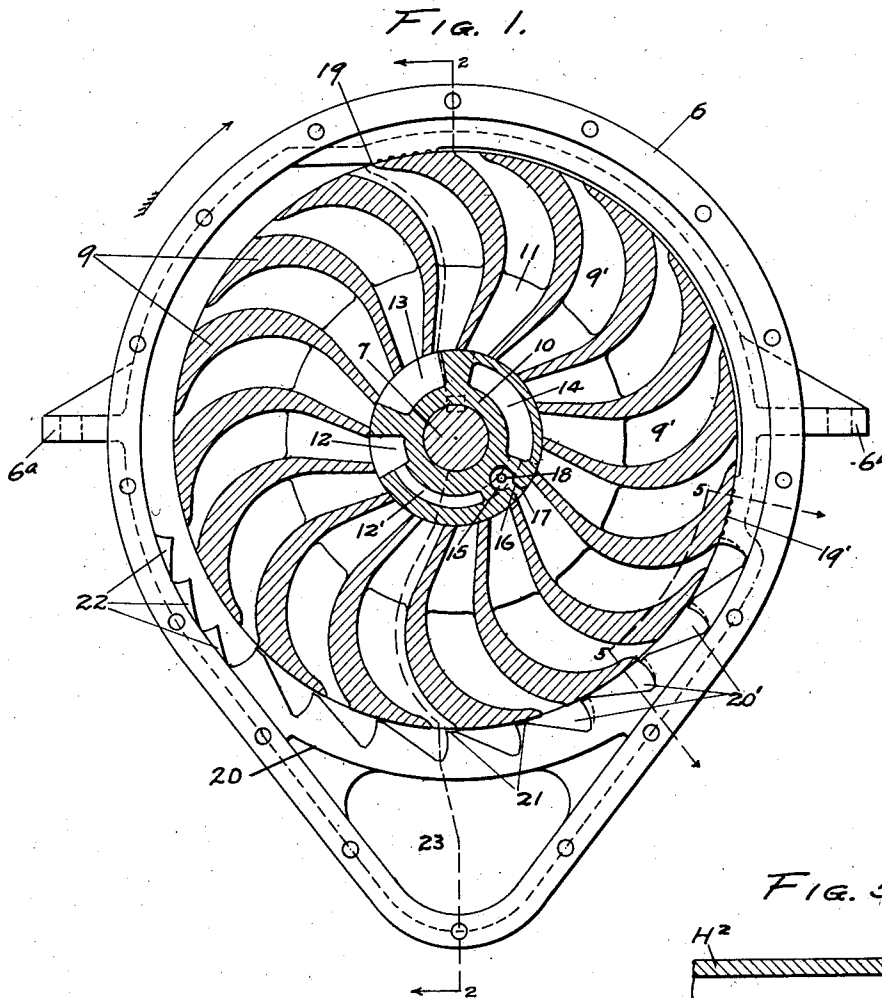
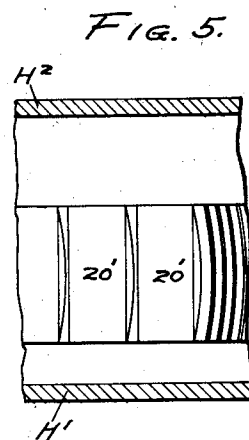


C. F. NOAKES.
 TURBINE HYDROGAS MOTOR.
 APPLICATION FILED AUG. 13, 1917.

1,260,015.

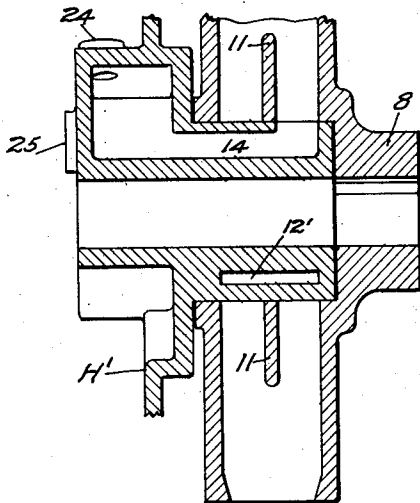
Patented Mar. 19, 1918.
 2 SHEETS—SHEET 1.



Clifton F. Noakes Inventor,
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1,260,015.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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TURBINE HYDROGAS-MOTOR.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLIFTON F. NOAKES, a citizen of the United States, residing at Hillsdale, in the county of Multnomah, State of Oregon, have invented a new and useful Improvement in Turbine Hydrogas-Motors, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to a class of devices wherein a combustible fluid is employed as the basis of motive energy.

The object of my invention is to provide a device wherein the pressure of water is utilized, supplemented by the more powerful pressure of a combustible fluid energy exerted upon the water by explosive impulses, the whole being designed in a turbine arrangement. Also wherein a practically continuous series of impulses by means of the combustible fluid explosions are attained, and the exploded fluid is likewise continuously discharged under pressure of the water and is further continuously followed by the reception of fresh combustible fluid behind the water to renew the means to produce the motive energy. I attain these objects, as well as others, by the construction, combination and arrangement of parts, as illustrated in the accompanying drawings which form a part hereof.

Figure 1 is a front elevation of the device partly in section on the line 1—1 of Fig. 2, the front head being removed.

Fig. 2 is a sectional view on the line 2—2 in Fig. 1.

Fig. 3 is a fragmentary front elevation showing some parts behind in dotted lines.

Fig. 4 is a fragmentary sectional view of a part on the line 4—4 of Fig. 3.

Fig. 5 is a nearly horizontal sectional view of a part on the line 5—5 of Fig. 1.

Like numerals and letters refer to like parts throughout the views.

A cylinder 6 of suitable form is provided and has supporting arms 6^a and 6^b. A power transmission shaft 7 extends through the cylinder. A rotary member 8 is rigidly secured upon the shaft 7 within the cylinder. The member 8 has vanes 9 extending from its hub to its periphery and providing passages 9' which are curved in a direction opposite to the direction of rotation of the member 8. This member also has an integral, circular web 11 extending from its hub a suitable distance outwardly between

the sides of the vanes and within their intervening passages 9'. A sleeve 10 extends from without the front head of the cylinder into the same, about the shaft 7, and within the hub of the member 8 a suitable distance, the hub being rotatable over the sleeve. The sleeve 10 has a water port 12 opening into the inner ends of the vane passages when opposite them. From the water port 12 a passage 12' extends within the sleeve a suitable distance in the form of a segment of a circle to the water port 14. The port 12 is of a length sufficient to open on both sides of the web wholly into one vane passage and partly into the succeeding one when they are opposite. The sleeve 10 also has a combustible fluid port 13 opening on both sides of the web into the vane passages when opposite, and a second water port 14 on the rear side of the web only opening into the vane passages when opposite. The sleeve is further provided with an ignition chamber 15 having a discharge port 16 extending from it to a concave opening 17 at its end which last opens on the front side of the web into the vane passages when opposite. The opening 17 is of a width greater than the end of the opening vane wall so that the opening will partly cover the inner end of one vane passage and that of the succeeding one at the same time. Within the chamber 15 is an igniter 18 which extends outwardly to any suitable means of ignition production. In the cylinder a clearance space extends from the vicinity of the ignition chamber in a curved direction for a suitable distance and terminates in a point to which it tapers at 19. A water receiving chamber 23 is formed in the lower part of the cylinder, the former being provided with a discharge port 23'. Within the cylinder, and in the upper part of the chamber 23, a curved bridge 20 extends across. In this bridge are formed a series of buckets or pockets 20' opening upwardly and extending from a position opposite the ignition chamber to a position about opposite the port 12. The intervening walls 21 of the buckets rise to a height in which they just clear the rims of the member vanes 9. From the end of the bridge 20 there extends a second series of buckets 22 of a lesser height, integral in the cylinder casing, and terminating about opposite the port 12. The remainder of the clearance space to the point 19 is unoccupied. The walls of each series of buckets

are the same distance apart as the length of the opposing vane rim. There is also clearance space in front and rear of all buckets to allow water to flow downward into the chamber 23. The outer opening of each vane passage is of suitable dimensions. The front cylinder head H^1 is provided with a water inlet 24 extending from a source of supply to within the sleeve and to the inner part of the ports 12 and 14. There is also a rear cylinder head H^2 . A combustion mixture inlet 25 extends from a source of supply to the port 13.

From the point 19 the cylinder casing extends inwardly flush with the vane rims a distance the length of one vane rim, but so as to allow sliding engagement between them. From the inner end of the bridge 20 that portion 19' of the cylinder casing is arranged in a similar manner for about a like distance. The above portions of the cylinder casing are formed and arranged in positions related to the port 14 so that as the rear end of each outer vane passage arrives at the point 19 the inner end of the vane passage opens wholly into the port 14 and as the forward end of the outer vane passage arrives at the forward end of the portion 19' the inner end of the vane passage is closed to the port 14. Between the point 19 and the part 19' there is a small clearance space between the cylinder casing and the member vanes.

It will now be observed that when the device is in operative position, receiving water and combustion mixture to the respective ports, the cycle of operation is as follows:

The vane passage opposite port 12 has exhausted combustion mixture therein. The port 12 admits water to this passage and the pressure thereof forces the exhausted mixture, with the water, into the clearance space and thence outwardly to the chamber 23 and through the discharge port 23' from which the water may be returned to a reservoir for subsequent use. The vane passage then comes into connection with the mixture port 13 and receives combustion mixture until filled on both sides of the web, and the same is shut off as the discharge end of the passage passes over the casing at point 19. As the vane passage comes opposite the port 14, water is discharged therefrom into the vane passage to the rear of the web only. This will leave the combustion mixture behind the water and in the vane passage on the side of the web opposing the ignition chamber port. The mixture, at this time, is compressed to a suitable density required for its proper explosion. At this time the outer vane passage opening passes over the casing part 19' and the inner passage opening immediately passes beyond the port 14 and the inflow of water ceases. The inner vane passage opening then is brought opposite

the ignition port 17 and the combustion mixture spreads into the chamber 15. The body of the mixture is then exploded behind the water in the vane passage. This drives the water into the opposing buckets and causes the member 8 to rotate and perform the same cycle of impulse operation for each succeeding vane passage, and thus to rotate the shaft 7 and transmit power through the latter.

It will be further observed that by arranging the ignition chamber passage so it will open into the succeeding vane passage quickly, after the explosion in the prior one, the generated heat will explode the mixture in the latter without the action of the igniter. This enables the operator to use a simple battery for the first ignition. I may also arrange a cut-off to use water from some power source to introduce through the inlet 24. The object of the inter port passage 12' is to cool the mechanism.

I contend that my device is novel in many respects and refer to some particularly. For example, the pressure of water to eject the exhausted combustion mixture, the discharging of water from the vane passage leaves a partial vacuum which draws into that space a fresh supply of combustion mixture, the arrangement to force the water into the vanes ahead of the gas, the continuous explosions from vane to vane, the introduction of water near the center of the rotary member. Further, that there is such a rapid succession of motive impulses that the turbine runs smoothly and develops a large amount of power. I contend that, having eliminated various of the usual parts of the engines of common type, the arrangement and the few parts comprising my device have the decided advantage of reducing the retardation by friction to a most practical minimum, also that I have especially eliminated the lost motion and power of the ordinary piston, due to its return stroke, my rotary member always moving ahead.

While I have indicated the use of water and a gaseous mixture, yet, a heavy oil burning means, combined with an igniter, may be substituted, and another suitable fluid besides water substituted for it without departing from the principles disclosed in my device. I also maintain that with the sixteen impulses here illustrated the same can be maintained with the regularity and continuity as in a four cycle gas engine with 32 cylinders, of common type. A reverse movement to that illustrated may be obtained by installing twin devices upon the same shaft with suitable cut-offs.

I claim:

1. A device of the character described, comprising in combination a cylinder having a clearance chamber in its lower part and a discharge port therefrom, a rotor

shaft extending through the cylinder, a rotor within the cylinder rigidly secured on the shaft said rotor having vanes extending laterally from its hub to its periphery in a manner to provide a plurality of passages open at each end and curved in a direction opposite to the rotating direction of the rotor, the outer ends of said passages being arranged to open into the clearance chamber in a predetermined manner and time, said rotor also having an integral, circular web extending from its hub a suitable distance between the front and rear of said vanes and within their intervening passages, a bridge within the clearance chamber having a series of buckets oppositely disposed to the outer ends of the vane passages and arranged to receive a discharge from said passages in a predetermined time and manner, a sleeve extending from without the cylinder into the same and about the rotor shaft within rotor hub a suitable distance, said sleeve being provided with a water inlet port and water discharge ports, one of which latter discharges on one side the other on the opposite side of the aforesaid web, also provided with a combustion mixture inlet and discharge port the latter arranged to open into the inner ends of the vane passages on either side of the rotor web at a predetermined time when the rotor is moving, and also provided with an ignition chamber having a combustion mixture inlet, a discharge port opening into a vane passage on one side of the web and an igniter within the chamber, the said discharge port being arranged for its discharge at a predetermined time, and a second series of similar buckets of lesser depth integral in the inner cylinder casing extending from the outer end of the said bridge, the buckets being arranged to receive the discharge from the vanes induced when each of the water ports is discharging into a related vane passage in a predetermined manner and time, substantially as described.

2. A device of the character described, comprising in combination a cylinder having a clearance chamber in its lower part and a discharge port therefrom, a rotor shaft extending through the cylinder, a rotor within the cylinder rigidly secured on the shaft said rotor having vanes extending laterally from its hub to its periphery in a manner to provide a plurality of passages open at each end and curved in a direction opposite to the rotating direction of the rotor, the outer ends of said passages being arranged to open into the clearance chamber in a predetermined manner and time, said rotor also having an integral, circular web extending from its hub a suitable distance between the front and rear of said vanes and within their intervening passages, a bridge within the clearance chamber having a series of buckets oppositely disposed to the outer ends of the vane passages and arranged to receive a discharge from said passages in a predetermined time and manner, a sleeve extending from without the cylinder into the same and about the rotor shaft within rotor hub a suitable distance, said sleeve being provided with a water inlet port and water discharge ports, one of which latter discharges on one side the other on the opposite side of the aforesaid web, also provided with a combustion mixture inlet and discharge port, the latter arranged to open into the inner ends of the vane passages on either side of the rotor web at a predetermined time when the rotor is moving, and also provided with an ignition chamber having a combustion mixture inlet, a discharge port opening into a vane passage on one side of the web and an igniter within the chamber, the said discharge port being arranged for its discharge at a predetermined time, and a second series of similar buckets of lesser depth integral in the inner cylinder casing extending from the outer end of the said bridge, the buckets being arranged to receive the discharge from the vanes induced when each of the water ports is discharging into a related vane passage in a predetermined manner and time, substantially as described.

CLIFTON F. NOAKES.

Witnesses:

R. B. POTTS,
GEO. F. FELTS.