No. 874,616. PATENTED DEC. 24, 1907.

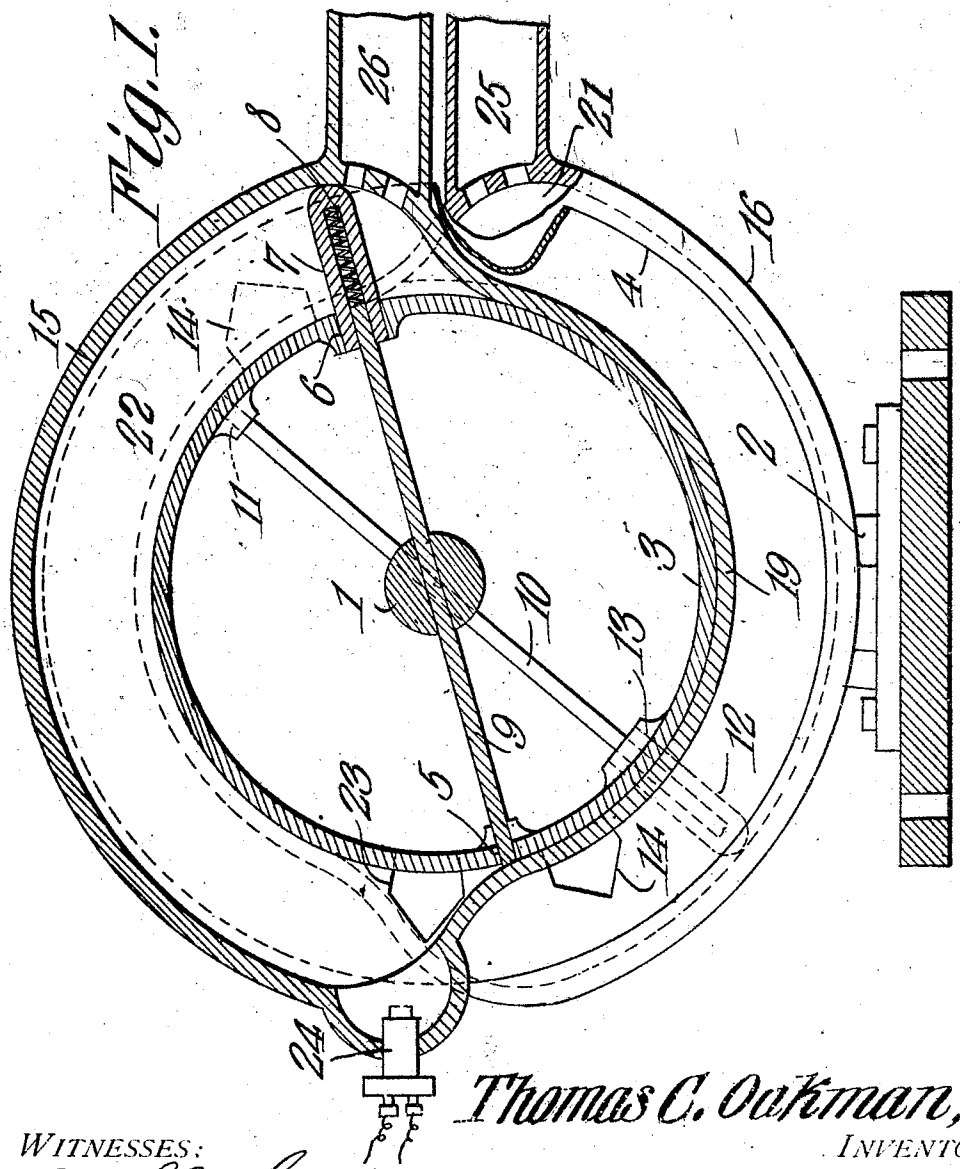
T. C. OAKMAN.

ROTARY ENGINE.

APPLICATION FILED MAR. 11, 1907.

4 SHEETS—SHEET 1.

Fig. 1.



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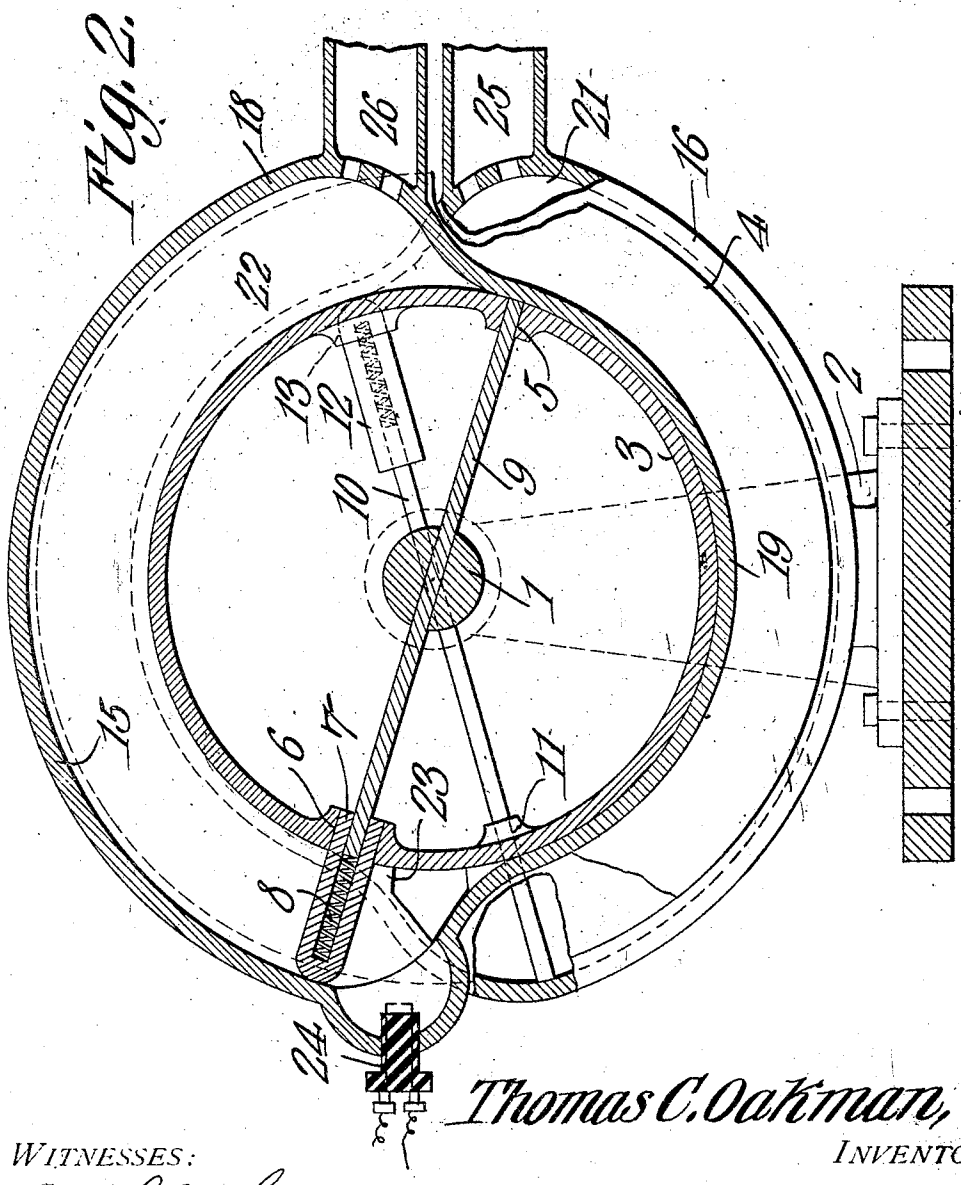
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4 SHEETS—SHEET 2.

Fig. 2.



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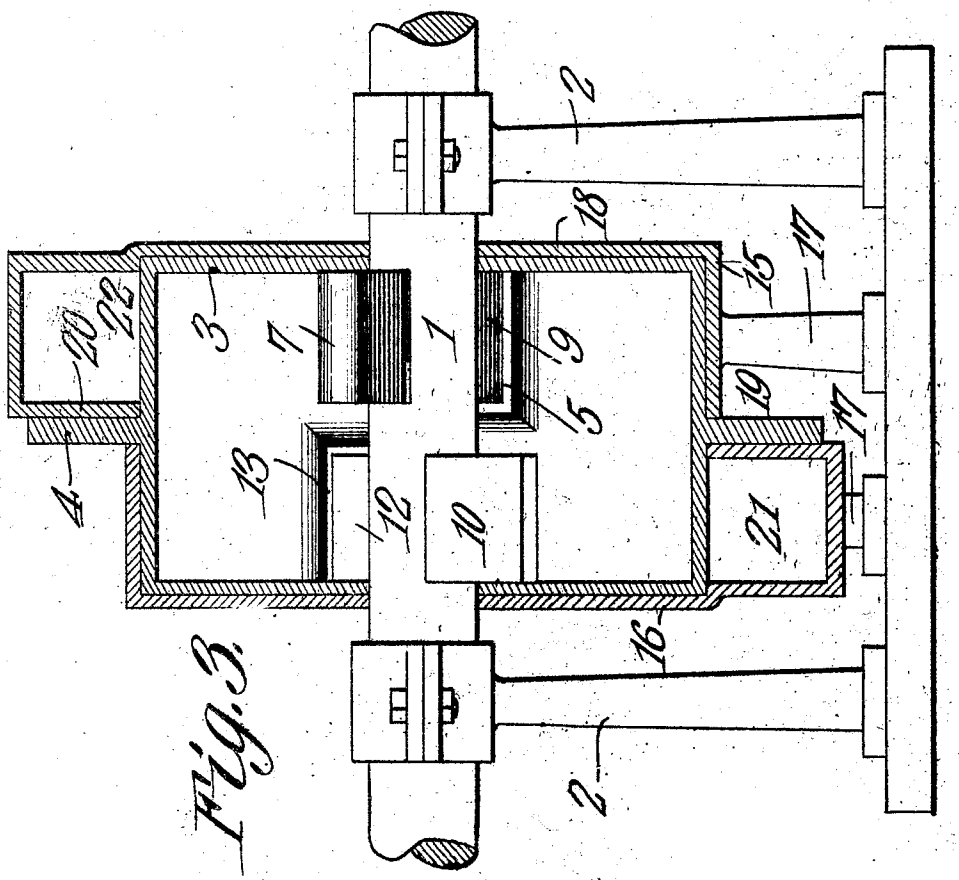


Fig. 3.

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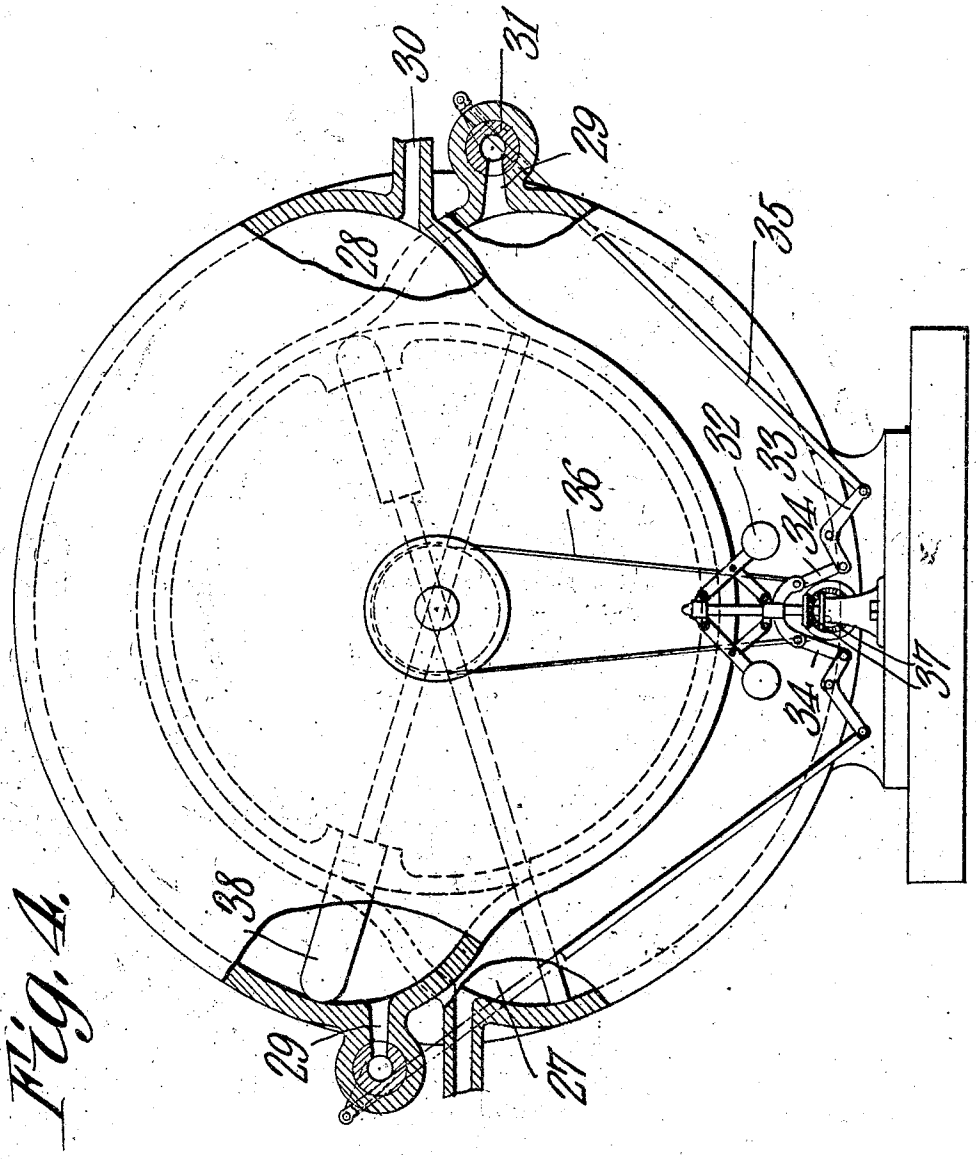


Fig. 4.

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UNITED STATES PATENT OFFICE.

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ROTARY ENGINE.

No. 874,616. Specification of Letters Patent. Patented Dec. 24, 1907.

Application filed March 11, 1907. Serial No. 361,747.

To all whom it may concern:

Be it known that I, THOMAS C. OAKMAN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Rotary Engine, of which the following is a specification.

This invention relates to rotary engines of that type utilizing explosive gases as a propelling medium.

The object of the invention is to provide a simple, compact and durable form of engine having means whereby motive fluid can be sucked into and compressed within the casing and subsequently expelled into the explosion chamber where its explosion propels the piston within said chamber so as to cause a new supply of gas to be sucked into and compressed within the receiving or compression compartment.

Another object of the invention is to provide compression and explosion compartments disposed in parallel planes each compartment carrying a separate piston, one of which acts as a compression device while the other serves to receive the impulse from the exploded charge.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings: Figure 1 is a section through the explosion compartment and its piston and showing the compression compartment in elevation, the pistons in the two compartments being illustrated in position just prior to the expulsion of the compressed gases into the explosion compartment and back of the piston in said compartment; Fig. 2 is a view similar to Fig. 1 and showing the positions of the parts while the gas is being discharged into the explosion compartment; Fig. 3 is a vertical transverse section through the engine, the two pistons being shown in elevation; and Fig. 4 is a view partly in elevation and partly in section of a modified form of the invention.

Referring to the figures by characters of reference, 1 is a shaft mounted in suitable standards 2 and secured to and rotatable with this shaft is a hollow cylindrical wheel 3. This wheel carries an annular flange 4 located about the center thereof and formed within the periphery of the wheel at one side of the flange and at diametrically opposite points are slots 5 and 6. The slot 6 is of greater width than the slot 5 and receives a hollow blade 7 constituting a piston section and within this blade is disposed a coiled spring 8 which exerts a constant pressure against the end of a blade 9. The other section of the piston 7 is slidably mounted within the shaft 1 and the opening 5. Slidably mounted in the shaft 1 at an angle to the plane occupied by the piston section 9 is another piston section 10 one end of which extends through an opening 11 in the periphery of wheel 3 while the other end projects into a hollow blade 12 constituting a piston section and containing a spring similar to the spring 8. This blade 12 projects through an opening 13 and the flange 4 projects between the openings 13 and 11 and the openings 5 and 6. The pistons can be placed at any desired angle to each other and as shown in the drawings they are preferably disposed at an angle of about 35°. Ports 14 are formed within the flange 4 at diametrically opposite points, said ports being disposed between the apertures 5 and 13, and 6 and 11.

Surrounding opposite portions of the wheel 3 are casings 15 and 16 each of which is suitably supported as by means of a standard 17 and consists of a head 18 bearing loosely upon the shaft 1 and having an inwardly extending portion 19 lapping the periphery of the wheel and abutting against one side of the flange 4. This inwardly extending portion of each casing is concentric, and contacts, with the periphery of the wheel 3 for about one-half the circumference of said wheel, the balance of said inturned portion being spaced from said periphery to form a compartment extending for about one-half the circumference of the wheel. The compartments of the two casings are disposed opposite to each other and each of these compartments has an inner wall 20 parallel with the head 18 and bearing against the flange 4. One of these compartments which has been indicated by the numeral 21 is, for the sake of convenience, termed a compression compartment while the other compartment 22 is termed an explosion compartment. The two compartments lap at their ends and alining ports 23 are formed in their inner walls 20 where they

lap at one end. A suitable sparking device 24 is located in that end of the compartment 22 adjoining its port 23. The piston sections are adapted to work within these compartments 21 and 22 and to ride upon those portions of the casings contacting with the periphery of the wheel 3. An intake port 25 opens into that end of compartment 21 farthest removed from the port 23 and an exhaust port 26 is formed within that end of compartment 22 farthest removed from the port 23.

When the parts are in the position shown in Fig. 2 and the shaft 1 and wheel 3 is rotated the piston section 7 is projected into the compartment 22 simultaneously with the exit of the piston section 9 from the opposite end of said compartment. The section 10 will trap within the compartment 22 all the gas which has been sucked thereinto by the former movement of the piston therein and as this gas can not escape from the compartment owing to the fact that the ports 23 are closed by flange 4 it is obvious that they will become compressed in front of said piston. Meanwhile, the rotating shaft 1 causes the piston section 9 to ride along the inwardly extending portion 19 of its casing 18 and finally causes it to project into the compartment 22 close to the sparker 24. Just as the piston assumes this position in compartment 22 the port 14 is brought into register with ports 23 and the compressed gases rush through said ports from the compression compartment 21 and into the explosion compartment. As the wheel continues to rotate the ports 23 will be closed and just as this closing takes place the charge within compartment 22 is ignited and the piston and its wheel propelled within said compartment. Any burned gases which may have remained in compartment 22 from the preceding explosion will be forced by the advancing piston through the exhaust 26. The compressing action of the piston 10 results in a new charge of gas being sucked into the compartment 21 from the intake 25 and this new charge is trapped by the piston section 12. The foregoing operation will then be repeated, the two sections of one of the pistons alternately operating to compress the charge while the two sections of the other piston alternately operate to receive the impact of the exploded gas. As a result of this arrangement two impulses are imparted to the wheel during each revolution thereof.

A fly wheel may be provided upon the shaft 1 for insuring the continuous operation of the device and by placing the sparker within the compartment 21 adjacent port 23 and providing a valve for reversing the intake and exhaust the rotation of the engine may be reversed by causing the compartment 21 to act as an explosion chamber and the compartment 22 as a compression chamber. This construction is so obvious that it is not deemed necessary to show or describe the same in detail.

It is to be understood that any desired form of valve may be provided between the two compartments 21 and 22 other than that disclosed it being merely necessary to provide means whereby the compressed charge will be expelled into the closed compartment immediately in rear of the piston therein and at predetermined intervals.

Although it has been found that a piston formed in two sections produces the best results it is to be understood that a piston of other desired form capable of being properly projected into the compartments may be used instead of those described and shown.

Although the engine has been described as utilizing an explosive mixture as a propelling medium it is to be understood that with slight modifications the same can be used as a steam engine without departing materially from the construction hereinbefore set forth. In Fig. 4 I have shown the engines designed to be propelled by steam power and by referring to said figure it will be seen that the two compartments 27 and 28 are provided with inlet ports 29 and exhaust ports 30, the inlet port of each compartment being disposed adjacent the exhaust port of the other compartment. A valve 31 is located adjacent each inlet portion for controlling the admission of steam and this valve may be controlled by a governor 32 through bell crank levers 33, links 34, and rods 35. The governor is designed to be driven by a belt 36 receiving power from the shaft of the engine and actuating gears 37 whereby the governor is rotated. The parts are so proportioned that when the speed of the engine diminishes the valve will be opened and when the speed increases the valve will be closed in proportion to the increase, thereby maintaining the speed uniform. Any desired valve may be utilized such as those of the Corliss type.

With this arrangement of parts it will be noticed that steam will be constantly directed into the two compartments from the inlet ports 29 so that the impact of the steam against the pistons 38 will cause the operation of the engine. It is of course to be understood that with this construction the two compartments 27 and 28 do not communicate.

What is claimed is:

1. An engine, having oppositely disposed arcuate compartments spaced laterally and having lapping ends, each compartment having an inlet at one end and an outlet at its other end, a revoluble element intersecting the planes occupied by said compartments and constituting the inner walls of the compartment, and a piston carried by said element and mounted to travel within each compartment, each piston comprising telescopic

sections and yieldable spacing means interposed therebetween.

2. In a rotary engine a revoluble member, an arcuate compartment partly surrounding said member, and disposed to receive an explosive mixture, said member constituting one wall of the compartment, a piston movable with said member and longitudinally of the compartment and disposed to compress and expel the mixture within the compartment, a second oppositely disposed arcuate compartment partly surrounding the revoluble member and disposed to receive the expelled mixture, said member constituting one wall of said compartment, a piston movable with said member and longitudinally of the compartment, and means for exploding the mixture to drive the last mentioned piston and propel the revoluble member.

3. In a rotary engine the combination with a revoluble member, a compressing piston movably mounted therein and revoluble therewith, and an impact receiving piston movably mounted within and revoluble with said member; of an arcuate compression compartment partly surrounding the revoluble member, said member constituting one wall thereof and said compression piston being movable longitudinally of said compartment, and an oppositely disposed arcuate explosion compartment partly surrounding the revoluble member and disposed to receive compressed fluid from the compression compartment, said impact receiving piston being movable longitudinally of the compression compartment.

4. In a rotary engine the combination with a revoluble member, a valve member integral and revoluble therewith, and compressing and impact receiving pistons movably mounted within and revoluble with said member at opposite sides of the valve member; of a fixed casing surrounding said revoluble member and formed with oppositely disposed laterally spaced arcuate compression and explosion compartments partly surrounding opposite portions of the revoluble member and disposed at opposite sides of the valve member, said pistons being disposed to work within the respective compartments and said member constituting the inner wall of each compartment.

5. An engine comprising a wheel, oppositely disposed compression and explosion compartments concentric with and closed by the wheel, said compartments having alining ports, a compression piston and an impact receiving piston movable with the wheel, and a flange upon the wheel and movable between the compartments, said flange having a port between the pistons adapted to register with and permit communication between the alining ports.

6. An engine comprising a wheel, a stationary casing surrounding the wheel and having a compartment extending partly around the wheel, and a piston radially movable within the wheel and adapted to project thereon and to ride against the casing and within the compartment, said piston consisting of telescopic sections, and resilient spreading means interposed therebetween.

7. An engine comprising a wheel, oppositely disposed compartments concentric with and closed by the wheel, each of said compartments having an inlet and an outlet, and a piston extending into each compartment and movable radially within the wheel, said pistons being designed to alternately project into the respective compartments.

8. An engine comprising a wheel, oppositely disposed compartments concentric with and closed by the wheel, each of said compartments having an inlet and an outlet, and a piston projecting into each compartment and movable radially within the wheel, said pistons being disposed to alternately project into their respective compartments and each piston consisting of telescopic sections and spreading means interposed therebetween.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

THOMAS C. OAKMAN.

Witnesses:

TERSIFOR FRAZER,

WM. H. ROBINSON.