C. J. COLEMAN.

ROTARY IMPACT ENGINE.

APPLICATION FILED DEC. 3, 1900. RENEWED DEC. 4, 1909.

1,003,708. Patented Sept. 19, 1911.

2 SHEETS—SHEET 1.

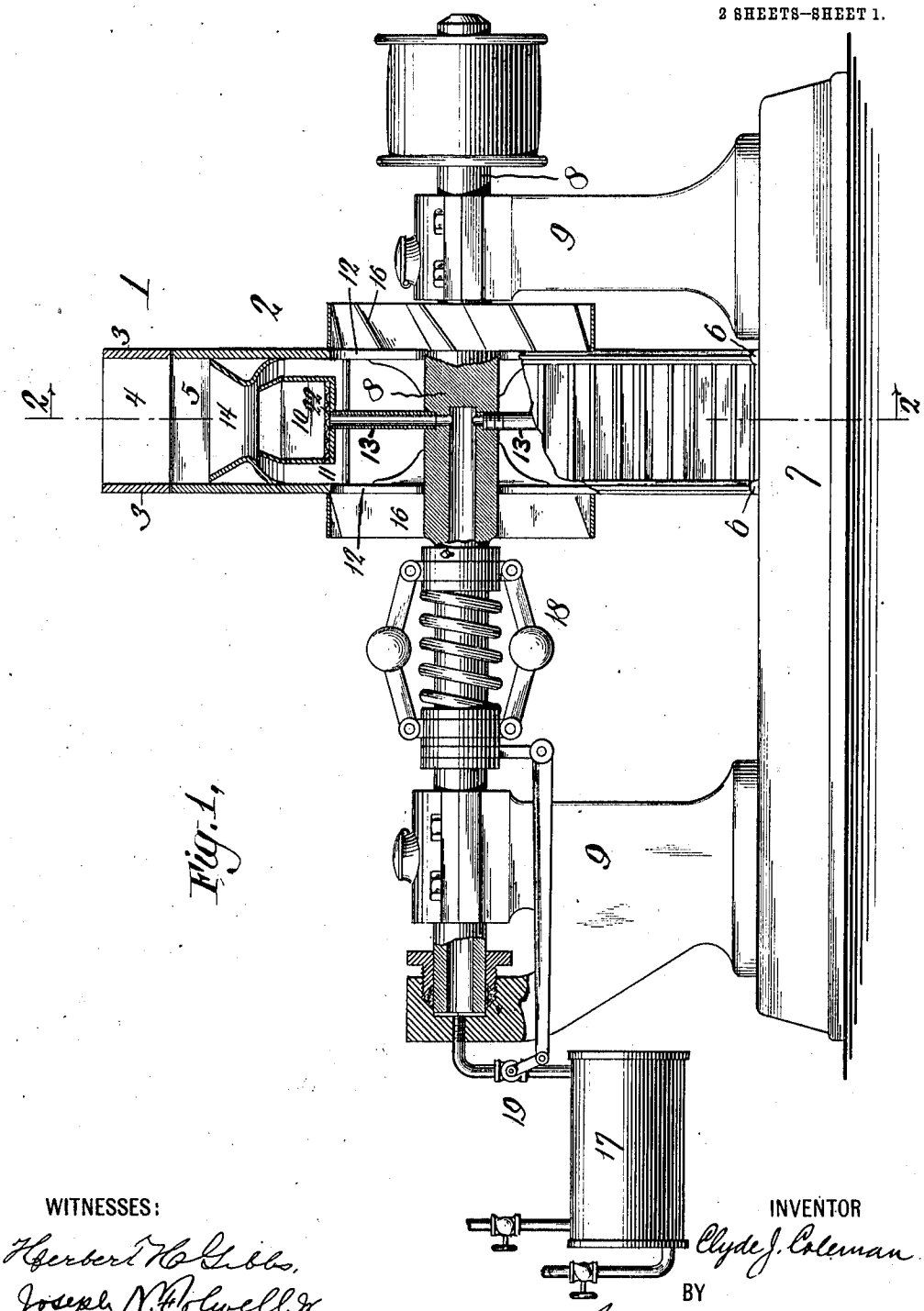

Fig. 1.

WITNESSES:

Herbert H. Gibbs.

Joseph W. Holwell, Jr.

INVENTOR

Clyde J. Coleman

BY

Henry D. Williams

ATTORNEY

C. J. COLEMAN.

ROTARY IMPACT ENGINE.

APPLICATION FILED DEC. 3, 1900. RENEWED DEC. 4, 1909.

1,003,708. Patented Sept. 19, 1911.

2 SHEETS—SHEET 2.

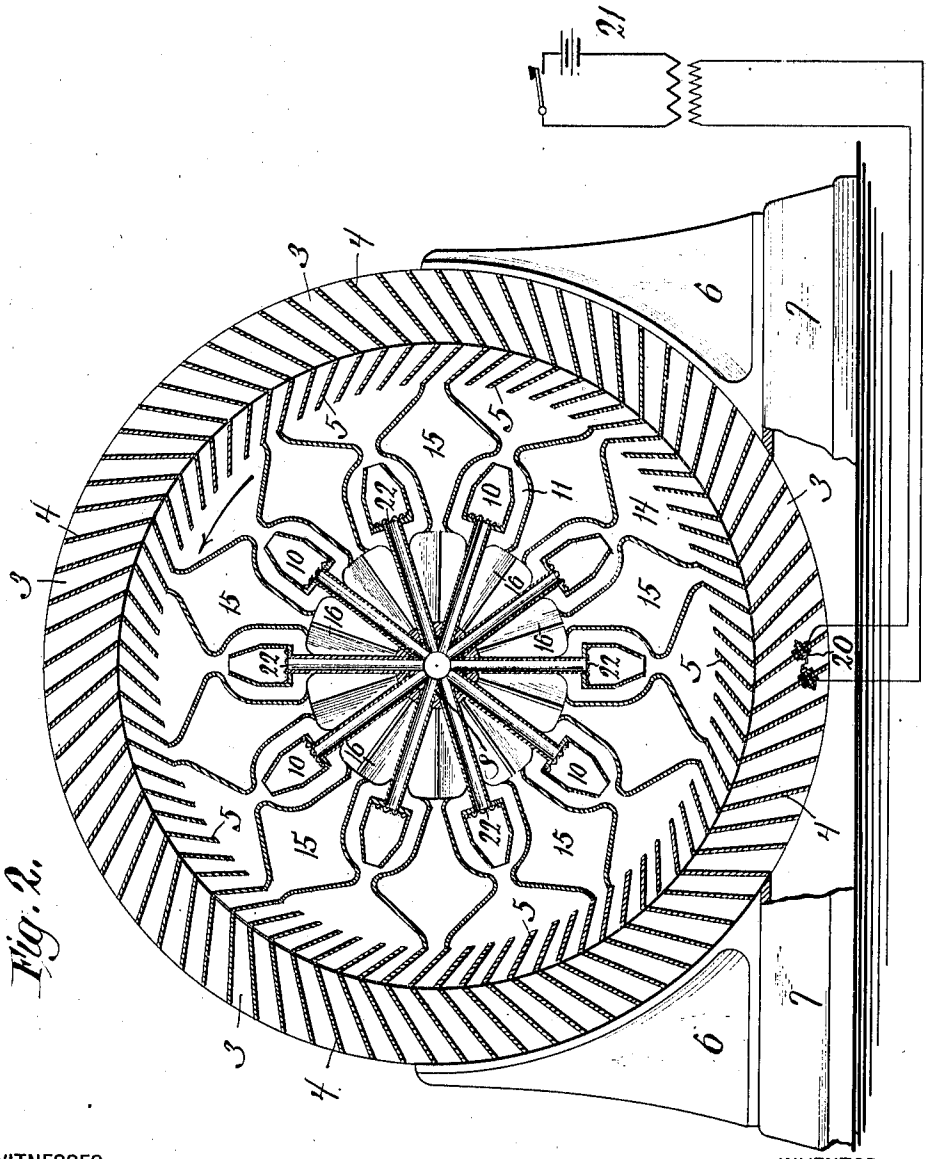

Fig. 2.

WITNESSES:

Herbert H. Gibbs

Joseph N. Holwell, Jr.

INVENTOR

Clyde J. Coleman

BY

Henry B. Williams

ATTORNEY

UNITED STATES PATENT OFFICE.

CLYDE J. COLEMAN, OF NEW YORK, N. Y., ASSIGNOR TO ROCKAWAY AUTOMOBILE COMPANY, OF ROCKAWAY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ROTARY IMPACT-ENGINE.

1,003,708. Specification of Letters Patent. Patented Sept. 19, 1911.

Application filed December 3, 1900, Serial No. 38,381. Renewed December 4, 1909. Serial No. 531,403.

To all whom it may concern:

Be it known that I, CLYDE J. COLEMAN, a citizen of the United States, and a resident of the borough of Manhattan, in the county of New York, city of New York, and State of New York, have invented new and useful Improvements in Rotary Impact-Engines, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention relates to improvements in rotary impact engines, wherein rotary movement is directly produced from and by the combustion of explosive gases or gaseous mixtures, forming the motive fluid.

The main object of my invention is to produce rotary motion from practically continuous combustion of explosive gases or gaseous mixtures.

Further objects of my invention are the provision of means whereby the motive fluid employed may be permitted to expand before reaching the point of impact, the provision of an injector, or injectors, for introducing the motive fluid, and the provision of a blower in connection therewith.

My invention also includes certain novel features of construction and combination of parts, all of which will appear from the following description of the engine embodying my invention illustrated in the accompanying drawings.

Figure 1 is a side view, partially in central vertical section of an engine embodying my invention. Fig. 2 is a vertical sectional elevation of the engine, the plane of section being taken on the line 2—2 of Fig. 1.

In the construction shown in the drawings, the engine comprises two parts, a stationary part 1 and a rotary part 2. The stationary part comprises annular side plates 3—3, having a plurality of impact blades or turbine vanes 4, arranged between the side plates, such blades or vanes being at an inclination to radial lines. The intervening spaces between the blades or vanes are exteriorly entirely uninclosed. Interiorly they are uninclosed by any stationary part but are arranged opposite to a plurality of turbine blades or vanes 5 with which the rotary part 2 is provided. The annular side plates 3, 3, and the turbine vanes 4 carried thereby, and together forming the stationary part 1, are supported by suitable brackets 6, 6, mounted upon a bed-plate 7. The rotary part is mounted upon a suitable shaft 8 journaled in bearings 9—9 also secured to bed-plate 7. The rotary part carries a plurality of injectors, the inner nozzles 10 of which connect with a supply of motive fluid, in this instance carried in through the interior of the shaft 8, made hollow for such purpose, and the outer nozzles 11 of which communicate with the outer atmosphere or other supply of cooling medium through central openings in the side walls 12, 12, of the rotary part 2. Pipes 13 form suitable connections between the hollow shaft 8 and the nozzles 10, and further form supports therefor. Each of the injectors discharges into one of a plurality of expansion chambers 14, one for each injector, and each of these chambers connects with a number of spaces intervening between a plurality of turbine vanes or blades 5, said turbine vanes forming the outer wall of such expansion chamber.

Intermediate of the injectors and expansion chambers are arranged cooling chambers 15. Each of these cooling chambers connects with the central opening in the side walls 12, and with one or more of the intervening spaces between the turbine vanes or blades 5. The cooling chambers are connected together moreover around the walls of the expansion chamber, as will be readily understood by reference to Fig. 1.

In operation the rotary part 2 revolves rapidly and draws in air or other vapor by the action of centrifugal force through the central openings in the side walls 12, and the air or other vapor thus drawn in, passes to the outer nozzles 11 of the injectors and to the cooling chambers 15. In order to augment this centrifugal force I connect a blower therewith, and in the drawings I have shown the rotary part 2 as provided with fan blades 16, these fan blades being arranged opposite both the openings in the side walls 12, and being adapted to act as a blower.

The blades 16 I herein term fan blades for the purpose of distinguishing them from the coacting turbine vanes heretofore described. Structurally they may or may not differ from them as may be desired. They are herein shown as radially arranged, but may, if desired, be arranged at an inclination to radial lines.

I have shown a conventional representation of a carbureter in the drawings at 17,

in which a mixture may be made of the gases to be used as motive fluid, and at 18 I have shown a centrifugal governor, mounted upon the shaft 8, and adapted to control the supply of motive fluid admitted to the engine by opening and closing a regulating valve 19.

I have shown igniting plugs 20 and a conventional igniting circuit at 21 for the purpose of igniting the motive fluid in first starting up the engine—when once started up the flame will pass from one to another of the intervening spaces between the turbine vanes or blades and successive igniting by an independent igniting means will be unnecessary.

When the engine is running normally, motive fluid will be drawn from the carbureter, through the hollow shaft and through the inner nozzles 10 of the injectors by the action of centrifugal force in the rotary part of the engine. Air or other vapors will be also drawn through the outer nozzles 11 by inductive action, augmented by the fan blades, and the mixture will be delivered into the chambers 14. Ignition will take place at the mouths of the inner nozzles 10. The rapid accumulation of pressure however, due to ignition, is greater than is required in the turbines, and much greater than will give the best results. It has been found that a maximum economy is obtained where the speed of a turbine is one half the velocity of the motive fluid at the point of impact. For this reason I permit the ignited motive fluid to expand in the chambers 14 and thereby reduce both its temperatures and its velocity between the point of combustion and the point of impact. The vanes 5 direct the ignited motive fluid toward the impact vanes 4 and the result is a powerful rotary movement of the part 2 in the direction of the arrow in Fig. 2. The air or other vapors drawn, or forced, in through the central openings in the walls 12 act also as a cooling medium in circulating through the cooling chambers 15 and around the walls of the expansion chambers 14, and further tend to cool the turbine vanes or impact blades by discharging therethrough and to clear the same of the residual products of combustion.

In order to avoid "back-fire" I provide the injectors with guards of wire mesh 22 or the like, as clearly shown in the drawings.

It is evident that various modifications may be made in the constructions above particularly described within the purview of my invention and that parts of my invention may be embodied in other constructions than those shown and described.

What I claim and desire to secure by Letters Patent is:—

1. A continuous combustion rotary impact engine having a rotary part wherein combustion is produced and wherein the motive fluid is expanded after combustion, a group of impact-receiving means each component part of which is arranged to receive at the same instant its respective portion of the expansive force of the motive fluid, substantially as described.

2. A continuous combustion rotary impact engine provided with means for producing combustion, a rotary part having expansion chambers wherein the motive fluid is expanded after combustion, impact-receiving means, and means upon the rotary part for completing the expansion chamber and for directing the expanded motive fluid against a group of impact-receiving means so that each part thereof will receive the expanded motive fluid at the same instant, substantially as set forth.

3. A continuous combustion rotary impact engine provided with means for producing combustion within the engine, means for supplying an auxiliary power medium in conductive adjacency to the products of combustion whereby the auxiliary power medium is commingled therewith and the temperature of the products of combustion is lowered, impact-receiving means, and means for directing the commingled products of combustion and auxiliary power medium against a group of impact-receiving means so that each part thereof will receive the motive power fluid at the same instant, substantially as set forth.

4. A rotary impact engine having an injector for the motive medium and an expansion chamber between the injector and the point of impact, a group of impact receiving means and suitable directing means forming the outer walls of said expansion chamber and adapted to direct the expanded motive medium against each component part of the group of impact receiving means, substantially as set forth.

5. A rotary impact engine comprising two parts, one stationary and the other rotary, both parts being provided with turbine vanes adapted to coact and the rotary part being also provided with concentric fan blades independent of the vanes, substantially as set forth.

6. A continuous combustion rotary impact engine comprising two power-developing members rotatable one relative to the other and one including impact-receiving surfaces and the other including motive fluid guiding ducts arranged to convey the motive fluid against such impact receiving surfaces, means for conveying motive fluid into the guiding ducts, and means for maintaining continuous combustion of the motive fluid at a point anterior to its impact against the impact receiving surfaces.

7. A rotary impact engine comprising an outer annular stationary part carrying turbine vanes or impact blades and an inner

revoluble part carrying turbine vanes near its outer edge, and independent concentric fan blades at points nearer its axis of rotation, substantially as set forth.

8. A rotary impact engine comprising two parts, one stationary and the other rotary, the stationary part being provided with impact vanes and the rotary part provided with an injector connecting with a supply of motive medium, and carrying a plurality of concentric fan blades adapted to supply cooling medium to the injector, substantially as set forth.

9. A rotary impact engine having an expansion chamber for receiving motive medium and encompassed by turbine vanes and permitting the same to expand between the point of combustion and the point of impact, and means whereby a circulation of a cooling medium is permitted around the said chamber, substantially as set forth.

10. A rotary impact engine having a plurality of expansion chambers encompassed by turbine vanes each receiving and permitting the expansion of motive medium between a point of combustion and a point of impact, and means whereby a circulation of cooling medium is permitted between the expansion chambers, substantially as set forth.

11. A rotary impact engine having a plurality of expansion chambers encompassed by turbine vanes each receiving and permitting the expansion of motive medium between a point of combustion and a point of impact, and having fan blades for drawing in a cooling medium between the expansion chambers, substantially as set forth.

12. A rotary impact engine comprising two parts, one stationary and the other rotary, the stationary part being provided with turbine vanes or impact blades and the rotary part with vanes adapted for the motive medium, with an injector for the motive medium, an expansion chamber between the injector and the turbine vanes said vanes encompassing the expansion chamber and means whereby a circulation of a cooling medium is permitted, substantially as set forth.

13. A rotary impact engine comprising two parts, one stationary and the other rotary, the stationary part provided with turbine vanes, and the rotary part with vanes adapted to coact therewith, with injectors for the motive medium and expansion chambers between the injectors and the turbine vanes, said vanes encompassing the expansion chamber and passages between the vanes of the rotary part for the circulation of a cooling medium, such passages discharging through the vanes of the stationary part, substantially as set forth.

14. A rotary impact engine comprising two parts, one stationary and the other rotary, the stationary part being provided with impact receiving vanes, and the rotary part provided with means for admitting motive medium and in addition thereto, with fan blades concentrically arranged at the periphery of the rotary part to direct the motive medium against the impact receiving vanes.

Signed at New York, N. Y., the 1st day of December, 1900.

CLYDE J. COLEMAN.

Witnesses:
HENRY D. WILLIAMS,
HERBERT H. GIBBS.