

980,771.

P. GLAMZO.
 ROTARY ENGINE.
 APPLICATION FILED APR. 11, 1910.

Patented Jan. 3, 1911.

4 SHEETS-SHEET 1.

Fig. 1,

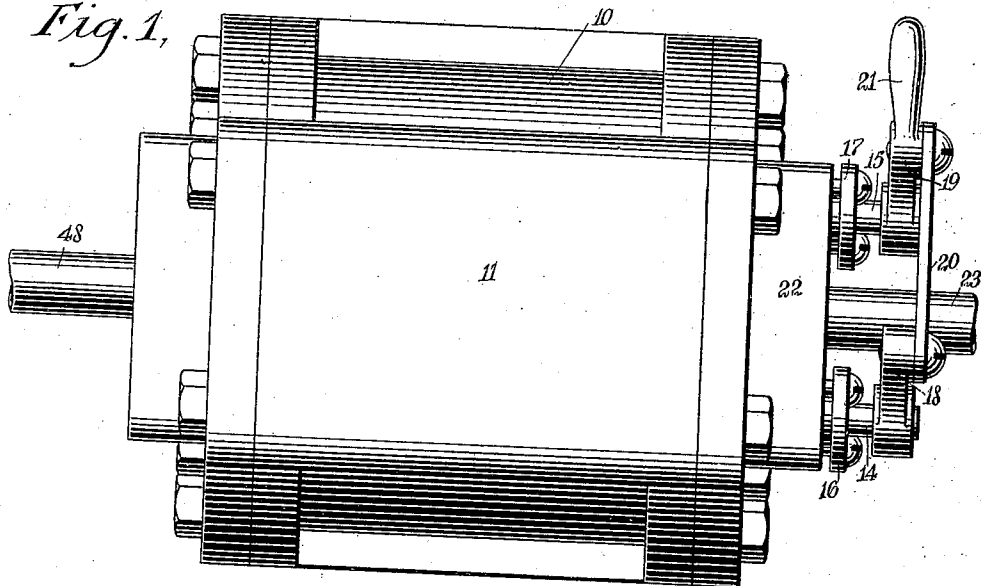
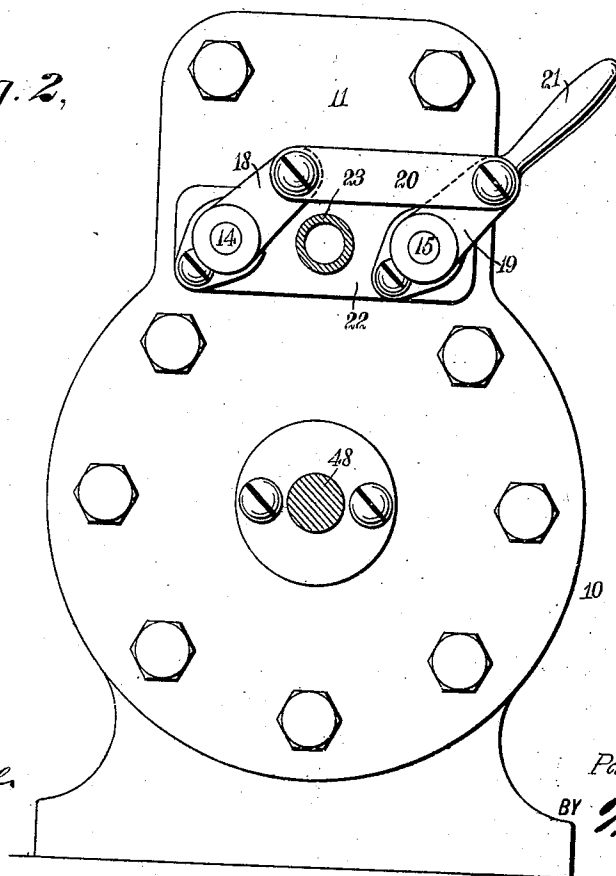


Fig. 2,



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4 SHEETS—SHEET 2.

Fig. 5.

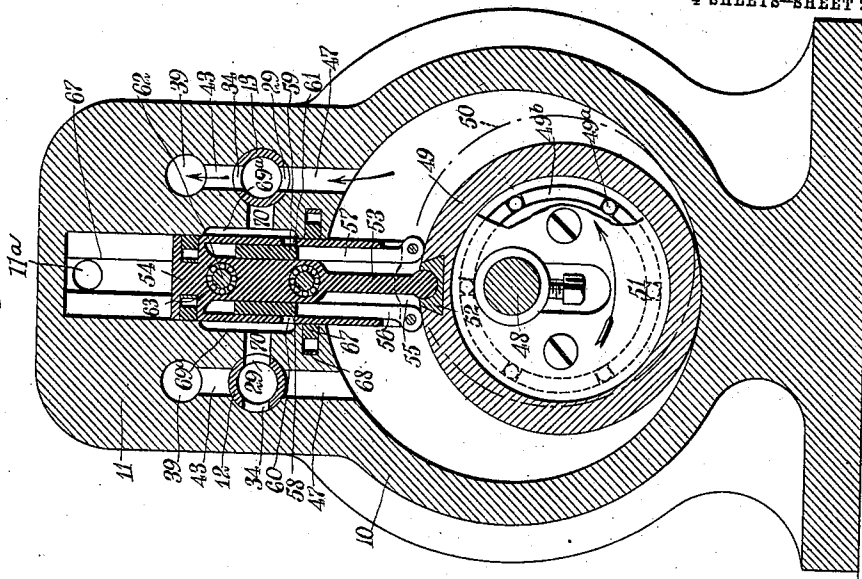


Fig. 4.

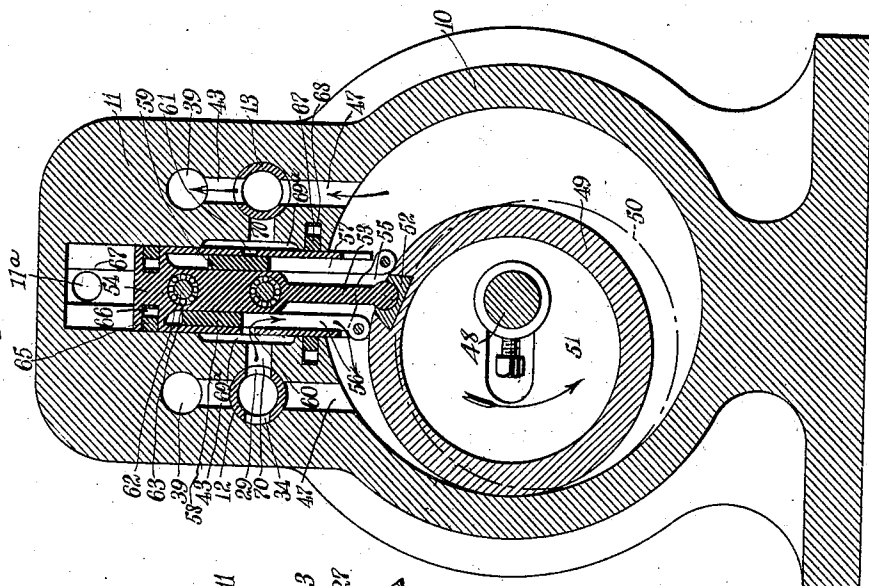
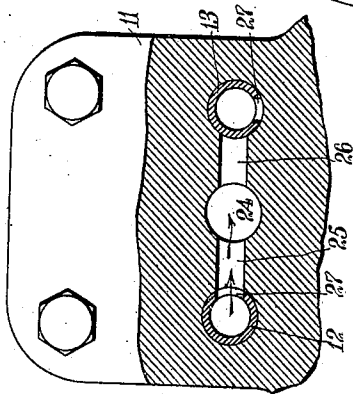


Fig. 3.



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4 SHEETS—SHEET 3.

Fig. 6.

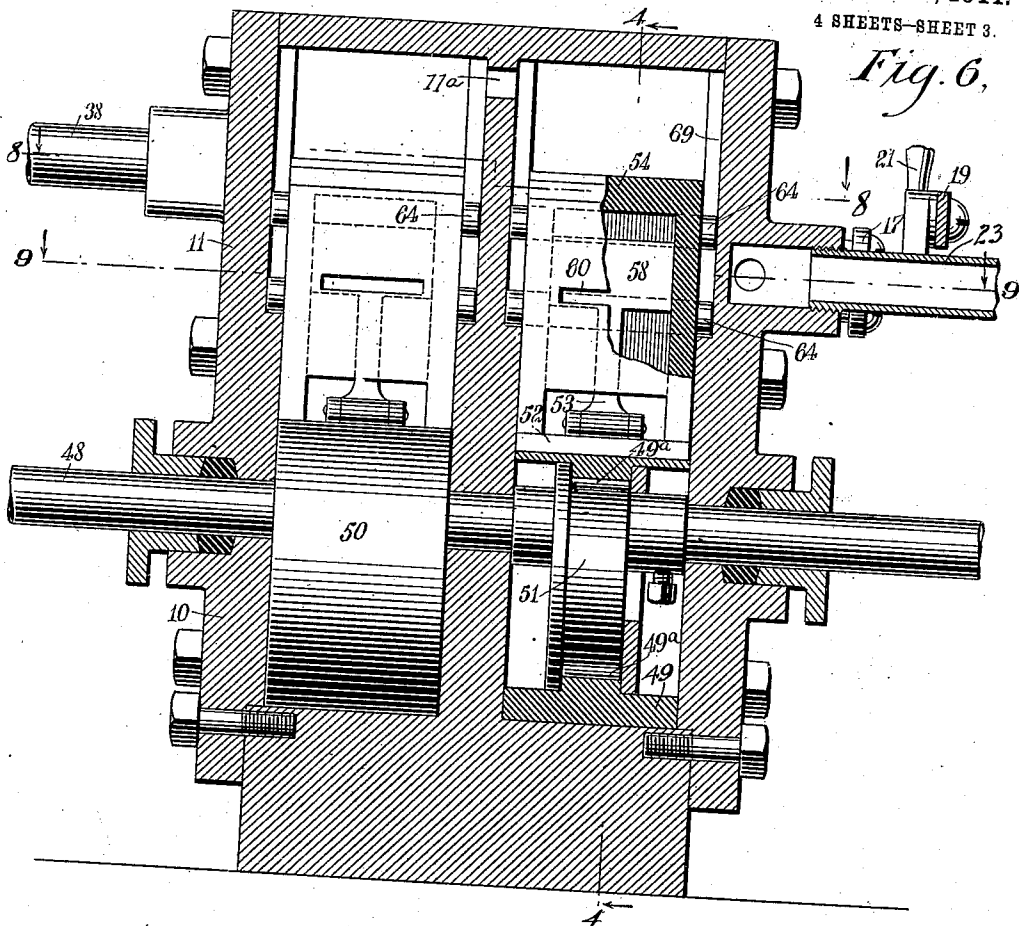
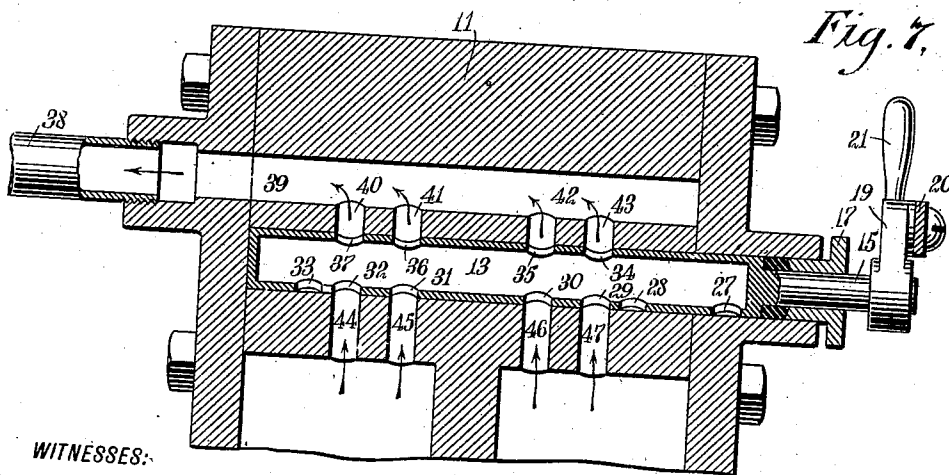


Fig. 7.



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4 SHEETS—SHEET 4

Fig. 8,

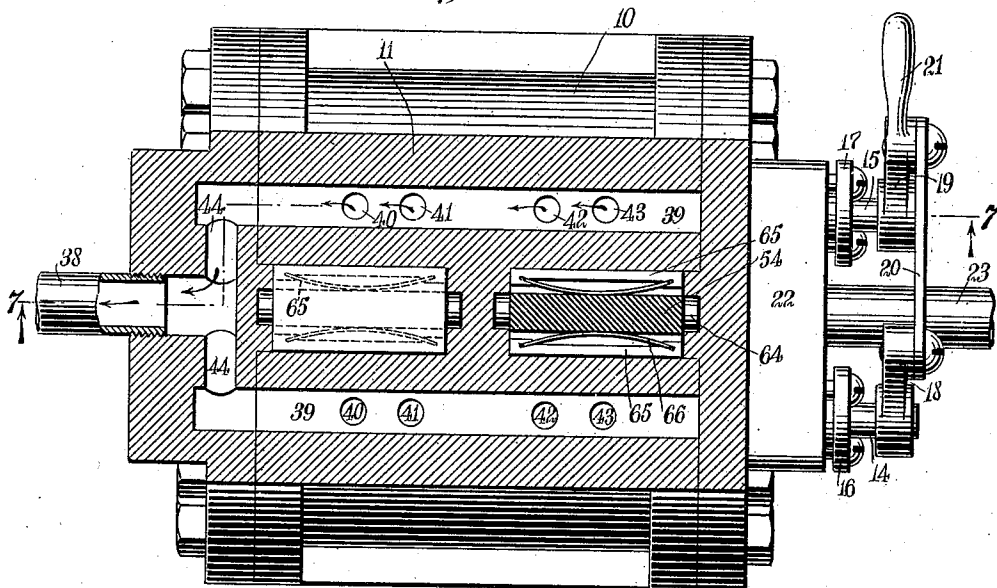


Fig. 9,

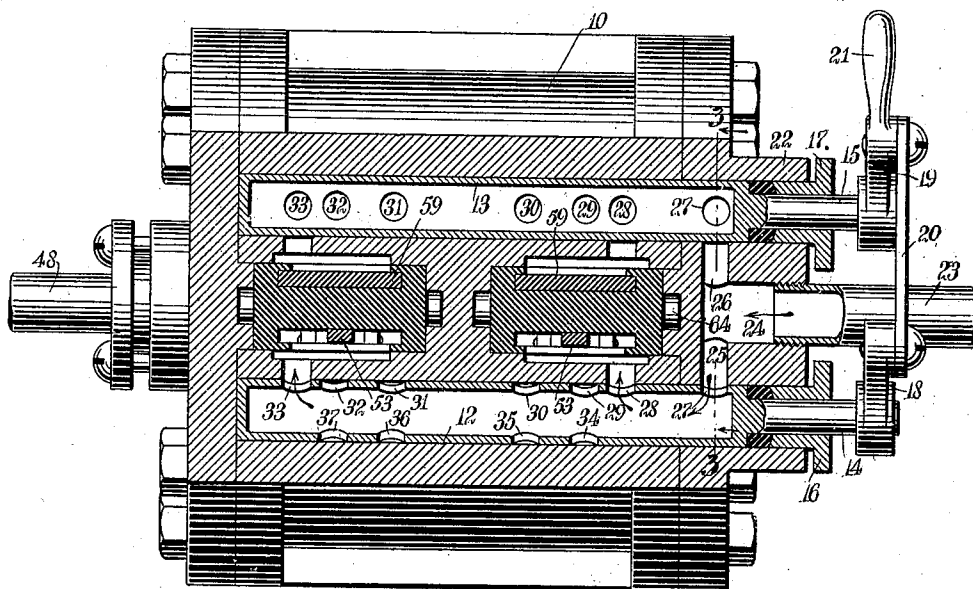
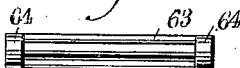


Fig. 10.



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UNITED STATES PATENT OFFICE.

PAUL GLAMZO, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO ANTON RAZUTO-VITCH, OF BROOKLYN, NEW YORK, AND ONE-FOURTH TO BALTRUS S. YANKAUS, OF NEW YORK, N. Y.

ROTARY ENGINE.

980,771.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed April 11, 1910. Serial No. 554,719.

To all whom it may concern:

Be it known that I, PAUL GLAMZO, a subject of the Czar of Russia, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

My invention relates to rotary engines, my more particular purpose being to produce a number of distinct improvements in an engine of the type using eccentric pistons.

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 plan view of my improved rotary engine complete; Fig. 2 is an elevation of the same, the inlet pipe and main shaft, however, being here shown in section; Fig. 3 is a detail showing in section on the line 3—3 of Fig. 9, looking in the direction of the arrows, a part of the arrangement of the inlet and exhaust ports; Fig. 4 is a section on the line 4—4 of Fig. 6, looking in the direction of the arrows, and showing one of the eccentric pistons and the valve mechanism which it operates; Fig. 5 is a view similar to Fig. 4, but showing various movable parts as occupying positions different from those they occupy in Fig. 4; Fig. 6 is a substantially central vertical section through the engine, certain parts being broken away; Fig. 7 is a section on the line 7—7 of Fig. 8, looking in the direction of the arrows, and showing the arrangement of one of the tubular valves; Fig. 8 is a section on the proximate line 8—8 of Fig. 6, looking in the direction of the arrows; Fig. 9 is a section on the line 9—9 of Fig. 6, looking in the direction of the arrows; and Fig. 10 is a detail showing one of the anti-friction devices used in connection with the slide valve, the figure, however, showing it as removed from the slide valve.

The cylinder casing is shown at 10 and extending upwardly from it is a steam chest 11. Extending horizontally into the steam chest are tubular valves 12, 13, adapted to be occasionally rocked or turned within predetermined limits. The tubular valves 12, 13 are connected with stub shafts 14, 15 which extend through stuffing boxes 16, 17. Mounted upon the stub shafts 14, 15 are

cranks 18, 19, and pivotally connected with these cranks and extending across from one to the other is a reversing bar 20 which is provided with a handle 21 extending upwardly. The operator, by grasping the handle 21 extending upwardly, and pushing or pulling the bar 20 in the general direction of its length, may turn the two tubular valves 12, 13 each about a quarter of a revolution. The stuffing boxes 16, 17 are supported by a housing 22 from which they extend. An inlet pipe is shown at 23 and communicates with a passage 24, and merging into this passage are ports 25, 26 which lead to the tubular valves 12, 13. Each of these tubular valves is provided with a number of ports 27, 28, 29, 30, 31, 32 and 33, arranged in a row, and is further provided with other ports 34, 35, 36, 37 arranged in another row diametrically opposite the row first mentioned, as will be understood from the lower portion of Fig. 9.

The exhaust pipe is shown at 38 and is in communication with two passages 39 disposed upon opposite sides of the engine. Merging into each passage 39 are a number of smaller passages 40, 41, 42, 43, and in alinement with these four passages just mentioned are four other passages 44, 45, 46, 47, as will be understood from Fig. 7. The main shaft is shown at 48 and encircling it are two eccentric pistons 49, 50. Mounted within each of these eccentric pistons is an eccentric disk 51 which is mounted securely upon the main shaft 48 and turns bodily as the latter rotates. Each disk 51 (see Figs. 4, 6) is provided with a dovetail cleat 52 sunken into it, and pivotally connected with this dovetail cleat is a link 53 which extends upwardly to a slide 54. Mounted rigidly upon the cleat 52 is a cross plate 55 and pivotally connected with the latter are valve stems 56, 57. Mounted upon the upper ends of these valve stems are slide valves 58, 59 which slide in vertical planes. Adjacent to these slide valves the slide 54 is provided with ports 60, 61, through which under proper conditions steam may pass into the body portion of the engine. Extending through the slide 54 are two rods 62, each encircled by a group of rollers 63, as indicated in Figs. 4 and 5. The ends of each rod 62 terminate in heads 64 which project slightly from opposite edges of the slide, as will be understood from Figs. 8, 9.

Each piston 49, 50 is provided with rollers 49^a and spacers 49^b separating these rollers, the spacers and rollers together constituting roller bearings.

5 The slide 54 carries a packing 65 having generally the form of a flat bar, and a spring 66 connected with this packing for forcing the same outward in order to make a steam-tight joint. Mounted within grooves within
10 the steam chest 11 are two other packings 67 similar to the packings 65 and provided with springs 68 for forcing these packings against opposite sides of the slide 54. The slide 54 has a vertical movement and the heads 64
15 slide in vertical grooves 69 when this movement of the slide takes place.

The eccentric pistons 49, 50 are so arranged relatively to the shaft 48 that the piston 50 has a very slight angular displacement as compared with the piston 49,
20 as will be understood from Figs. 4, 5. That is to say, the eccentric piston 50 occupies the same position as if it had been turned slightly ahead of the piston 49 in a contra-
25 clockwise direction according to these two figures. Disposed upon opposite sides of the slide 54 are passages 69^a and merging into the latter are shorter passages 70 which extend to the tubular valves 12, 13.

30 A short passage 11^a connects together the two upper compartments of the engine, and serves in a measure to equalize the pressure therein. It never happens that both slides
35 are at their extreme upper limits at the same instant; and if it should happen that owing to the undesirable escape of steam or to any other purpose, there should be a little vapor pressure in the upper portion of the engine,
40 the equalization of this pressure in the two compartments is quite desirable in order to prevent the slight binding action in consequence of the pressure.

The operation of my device is as follows: The parts being arranged as indicated in
45 Figs. 1, 2, 4, 8 and 9, and steam being admitted through the inlet pipe 23, this steam follows the passages 24, 25 and goes through the port 27 (now open, see bottom of Fig. 9) into the tubular valve 12. No live steam
50 can now get into the tubular valve 13, as will be understood from Fig. 9. The steam, once inside the tubular valve 12, now divides and passes out through ports 28, 33 and 70 (see bottom of Fig. 9) into the two pas-
55 sages 69^a upon that side of the engine represented by the bottom of Fig. 9. From these two passages the steam passes through ports 60 and down into the left side of the engine according to Fig. 4. Here it en-
60 counters the eccentric cylinders 49, 50, and by pressing the same downwardly causes the main shaft 48 to turn in a contra-clockwise direction. Each eccentric disk 51, while fixed relatively to the main shaft 48, is
65 nevertheless free to slide relatively to the

eccentric cylinder encircling the disk, so that each of the two eccentric cylinders 49 has a gyratory movement; whereas, each disk 51 turns bodily upon the axis of the shaft 48 as a center and at the same time has a typical
70 eccentric movement. The net result is that the two slides 54 reciprocate in a vertical plane, and that the two slide valves 58, 59, though carried bodily up and down with the slide, have each a slight movement relatively
75 to the slide, and consequently the valves 58, 59 periodically open and close the ports 60, 61. Since, however, the tubular valve stem 13 now occupies such position that no live steam can get through the port
80 61, the movement of the valve 59 is practically idle. The engine now runs in one direction. Each time a particular eccentric piston—say 49—executes its eccentric move-
85 ment, the main shaft 48 executes one complete revolution, the slide 54 makes one complete cycle, and each slide 58 also makes a complete two-stroke local movement relatively to the slide.

The parts are so proportioned that the
90 port 60 is completely closed by the slide 58 before the eccentric piston 49 is at the lowermost portion of its stroke, the result being that the engine uses, to some extent, the expansion of the steam. No live steam can
95 escape through the slide valve. The exhaust steam is upon the opposite side of the pistons 49, 50, and escapes upwardly through the following path: ports 44, 45, 46, 47 (see Fig. 7), tubular valve 13, ports 40, 41, 42,
100 43, passage 39, to exhaust pipe 38. The steam thus has a comparatively free escape and expends little or no back pressure.

The various steps above recited are repeated automatically over and over, so that
105 the engine is driven continuously. In order to reverse the direction of movement of the engine, the operator grasps the handle 21 and shifts the bar 20 to the left according to Fig. 2. The live steam now enters the en-
110 gine through the tubular valve 13, instead of through the tubular valve 12, so that the rotary parts now turn in the opposite direction, the rest of the working of the mechanism being the same as above described.
115

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

1. A device of the character described, comprising a casing, a piston mounted eccentrically therein, a slide connected with
120 said piston and movable bodily in relation to said casing, said slide having ports, slide valves carried by said slide and movable relatively to said ports for opening and
125 closing the latter, and valve stems connected with said slides for actuating the same, said valve stems being pivotally connected with said piston and controllable by motions of the latter.
130

2. The combination of a casing, a piston mounted therein and controllable by pressure of a fluid medium, a slide connected positively with said piston and provided with ports, slide valves mounted upon said slide and adapted to open and close said ports, and connections extending from said slide valves to said piston for the purpose of enabling motions of said piston to actuate said slide.

3. The combination of a casing provided with a slideway and with a steam compartment, a slide mounted within said slideway and provided with ports, an eccentric piston mounted within said steam compartment and adapted to turn in consequence of the steam pressure within said steam compartment, said piston being connected with said slide, slide valves carried by said slide and adapted to open and close said ports thereof, and a valve stem connected rigidly with said slide and pivotally connected with said piston for the purpose of enabling motions of said piston to actuate said slide.

4. A device of the character described, comprising a casing, a piston mounted therein and adapted to turn, a slide mounted within said casing and movable relatively to the same, said slide being connected to said piston and being provided with slide-

ways and with walls adjacent to said slideways, said walls having ports, slide valves carried by said slide and movably mounted within said slideways for the purpose of opening and closing said ports, and connections from said slide valve to said piston for the purpose of enabling movements of said piston to actuate said slide valve.

5. The combination of a casing, a slide mounted within said casing and movable relatively to the same, said slide being provided with ports, a piston connected with said slide and movable relatively to said casing for the purpose of actuating said slide, slide valves mounted within said slide and movable relatively to the same for the purpose of opening and closing said ports, said slide valves being at all times clear of actual contact with said casing, stems connected with said slide valves, said stems being actuated positively with said piston and movable by rotation of the latter.

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

PAUL GLAMZO.

Witnesses:

J. J. PAUKEZTIS,
K. BRAZYS.