May 13, 1930. E. R. KLEMM, JR 1,758,080

GOVERNOR

Filed Sept. 10, 1928

Fig. 2.

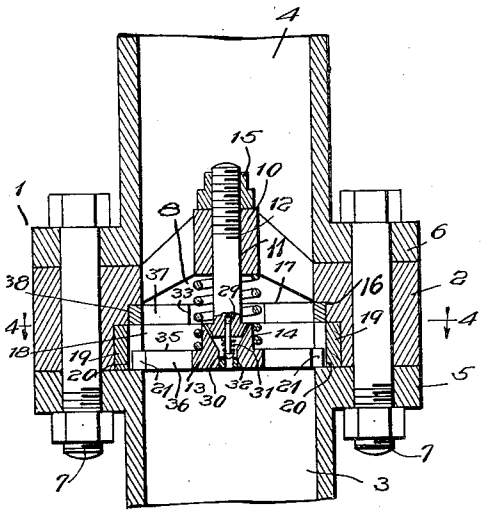


Fig. 1.

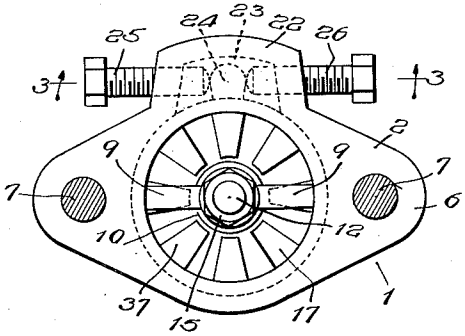


Fig. 5.

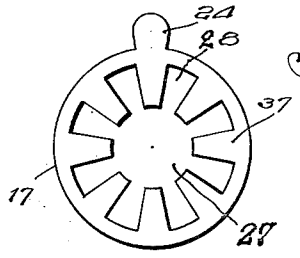


Fig. 3.

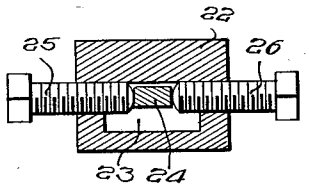


Fig. 4.

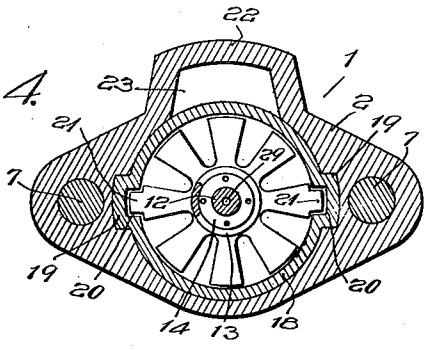
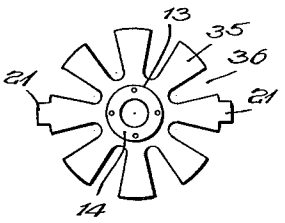


Fig. 6.



Witness:

William G. Kilroy

Inventor:

Emil R. Klemm Jr.

By Hill & Hill

Attys.

Patented May 13, 1930 1,758,080

UNITED STATES PATENT OFFICE

EMIL R. KLEMM, JR., OF CHICAGO, ILLINOIS

GOVERNOR

Application filed September 10, 1928. Serial No. 305,070.

This invention pertains generally to governors and particularly to a governor adapted for use with a fluid engine, and is a modification of the structure disclosed in my co-pending application Serial No. 271,492, filed April 20, 1928.

An object of applicant's invention is the production of a governor for a fluid engine whereby the fluid passing into the engine is regulated to control the speed of the engine.

Another object of the invention is the production of a governor which is adjustable so that the maximum speed of the engine may be increased or diminished as desired.

A further object of the invention is the production of a device wherein the controlling mechanism is actuated by the moving fluid.

Still another object of the invention is the provision of an auxiliary valve to relieve the drop across the device under certain conditions.

A further object of the invention is the production of a device of this kind which is simple in construction, of a small number of parts, easy to manufacture, durable, reliable and highly satisfactory for its intended purpose.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described and more particularly pointed out in the claims.

Applicant's device includes a plate or disk having a plurality of radially extending spokes and a second plate axially aligned with and movable relative to said first-mentioned plate, and also having a plurality of projecting spokes preferably the same in number as the spokes of the first disk. The spokes are made of substantially the same width as the open spaces therebetween, and means is provided for rotating the first disk so as to bring the spokes and intervening spaces into and out of alignment with the corresponding spokes and intervening spaces of the second-mentioned plate. The maximum speed of the engine is regulated by bringing the spaces between the spokes of the two disks or plates into and out of complete register. The disks are either in contact or in close proximity at the greatest speed of the engine, and the registering spaces between the spokes of the respective disks provide passageways for the flow of fluid past the disks. An auxiliary valve is provided to relieve the drop in the pressure across the governor at certain speeds of the engine.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a top view of the governor;

Fig. 2 is a sectional elevation of the same showing the governor connected to passages leading from the carburetor and to the engine;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a section on line 4—4 of Fig. 2;

Fig. 5 is a view of the immovable disk or plate; and

Fig. 6 is a view of the movable disk or plate.

Referring now to the drawings, the numeral 1 indicates a governor which includes a casing 2 mounted between a tubular member 3 leading from the carbureter and a tubular member 4 leading to the engine. The casing 2 is attached to the tubular members 3 and 4 by means of bolts 7 extending through flanges 5 and 6. A support 9 extends across the passage 8 of the casing 2 and is provided with an enlargement 10 at its mid portion. A bore 11 extends through the enlargement 10 for the accommodation of a stem 12 which is attached to a movable disk or plate 13. A resilient member 14 is positioned between the disk 13 and the enlargement 10. A stop 15 comprises a burr which threadedly engages the stem 12 and is normally in contact with the enlargement 10, thereby limiting the movement of the disk 13 under the force of the resilient member 14. The casing 2 is provided with a shoulder 16 which is engaged by a disk 17, said disk being held in position by a sleeve 18 disposed between the disk and a face of the casing 2. The stem 12 and spring 14 pass through an aperture 33 at the center

of the disk 17. The sleeve 18 is held in position by the flange 5 of the tubular member 3 and is preferably provided with oppositely disposed recessed projections 19. The projections 19 are each provided with a recess 20 which form guides for projections 21 which are oppositely disposed on the movable disk 13. The recesses 20 form runways for the projections 21 which permit the disk 13 to move in the direction of the longitudinal axis of its stem 12 but prevents rotation of the disk.

The casing 2 is provided with a hollow projection 22, the hollow portion 23 of which accommodates a projection 24 from the disk 17. The disk 17 is adjustable circumferentially by means of screws 25 and 26 which threadedly engage opposite sides of the projection 22 and abut opposite sides of the projection 24 on the disk 17.

The disk 13 is provided with a recess 27 into which open a plurality of converging channels 28 which have openings spaced about the stem 12. A recess 29 within the stem 12 accommodates the stem of a valve 30. The valve 30 is provided with a spring 31 whereby the head of the valve normally engages a valve set at the end of a tubular member 32 which is positioned within the aperture 27. When the valve 30 is opened, the channels 28 establish communication between the carburetor side and the engine side of the governor forming a vacuum release opening.

The disk 13 comprises a central solid hub portion to which the stem 12 is connected. A plurality of spokes 35 radiate from the hub portion of disk 13. The spaces 36 between the spokes 35 are preferably of substantially the same width as the corresponding portions of the spokes. The disk 17 comprises an outer rim portion from which a plurality of spokes 37 radiate inwardly. The spokes 37 terminate short of the center and form the boundary of the aperture 33. The spaces 38 between the spokes 37 are substantially the same width as that of the adjacent portions of the spokes 37. The disks 13 and 17 each have the same number of spokes and the spokes 35 of the disk 13 are substantially of the same width as the spokes 37 of the disk 17.

Each space 36 of the disk 13 is in alignment with a corresponding space 38 of the disk 17 to form a passageway through the disks for the fluid, said passageways having their maximum capacity when the spaces and spokes are in exact alignment. The flow of the fluid through the spaces 36 and 38 operates to force the disk 13 toward the disk 17 against the resistance of the spring 14. The disks 13 and 17 are brought into contact or into close proximity by the flow of fluid when the motor reaches its maximum speed. The spokes 36 and 38 being in alignment and the disks 13 and 17 in contact provides the condition by which the maximum flow of fluid is attained. By turning the screws 25 and 26, the disk 17 may be rotated so that the spaces 36 and 38 are only partially in register thereby restricting the size of the passageways and the possible flow of fluid therethrough. It is obvious that by thus narrowing the registering portions of the spaces 36 and 38, the flow of fluid through the engine can be controlled at will and is made adjustable over a very large range. At low speeds of the engine the flow of the fluid through the device is not substantially affected by an adjustment of the disk 17. The effect of adjustment of the disk 17 becomes more pronounced, for speeds near to the maximum which is the case when the disk 13 is in close proximity to the disk 17. In case the load on the motor is increased when operating at maximum capacity, the speed of the motor tends to reduce and demand more power for the motor to maintain the maximum speed under the increased load. The valve 30 opens and instantaneously reduces the drop across the governor by releasing disk 13 from disk 17, thereby permitting a larger flow of fluid to the engine. Without the valve 30 the speed would have to be substantially reduced before the disks 13 and 17 would be sufficiently separated to reduce the effect of the restricted passageway.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

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

1. A device of the kind described comprising a casing, a passage therethrough, a pair of disk shaped members within said passage for controlling the flow of fluid through same, said members each having an equal number of radiating spokes having open spaces therebetween, means yieldingly holding said members apart, one of said members being movable toward the other member by the flow of fluid to control said flow, and a valve in said movable member operable by the drop in pressure of fluid flowing through said member to provide a vacuum release opening.

2. A device of the kind described comprising a casing having a passage therethrough, a pair of disk shaped members positioned transversely of said passage for controlling the flow of fluid therethrough, said members having an equal number of radiating spokes, the spaces between said spokes providing passageways for the flow of fluid, means yieldingly holding the members apart, one of said members being movable relative to the other to vary the distance between said passageways to control said flow, said move-

ment being caused by a flow of fluid through said passage, means to vary the relative alignment of said passageways in said members, and a spring-pressed valve in said movable member opening in the direction of the flow of fluid to provide a vacuum release conduit.

3. A device of the kind described comprising a casing having a passage therethrough, a supporting member across said passage, a disk positioned transversely of said passage, said disk having a plurality of outwardly radiating spokes separated by spaces forming passageways, a stem projecting from said disk through an aperture in said support, a stop on the end of said stem, a resilient member between said support and said disk yieldingly holding the disk away from the support, a second disk-shaped member positioned transversely of said passage between said first-mentioned disk and said support, said disk having an outer rim portion and a plurality of spokes radiating inwardly from said rim portion, said spokes stopping short of the center of the disk to provide an aperture through which said stem and resilient member projects, the spokes of said second disk being equal in number to the spokes of said first-mentioned disk, and means for adjusting said second-mentioned disk circumferentially.

4. A device of the kind described comprising a casing having a passage therethrough, a supporting member across said passage, a disk positioned transversely of said passage, said disk having a plurality of outwardly radiating spokes separated by spaces forming passageways, a stem projecting from said disk through an aperture in said support, a stop on the end of said stem, a resilient member between said support and said disk yieldingly holding the disk away from the support, a second disk-shaped member positioned transversely of said passage between said first-mentioned disk and said support, said disk having an outer rim portion and a plurality of spokes radiating inwardly from said rim portion, said spokes stopping short of the center of the disk to provide an aperture through which said stem and resilient member projects, the spokes of said second disk being separated by passageways and equal in number to the spokes of said first-mentioned disk, means for adjusting said second-mentioned disk circumferentially, and a spring-pressed valve in said first-mentioned disk opening towards said support to provide a vacuum release conduit.

In testimony whereof, I have hereunto signed my name.

EMIL R. KLEMM, JR.