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W. N. RUMELY & C. N. WALSH.

GOVERNOR.

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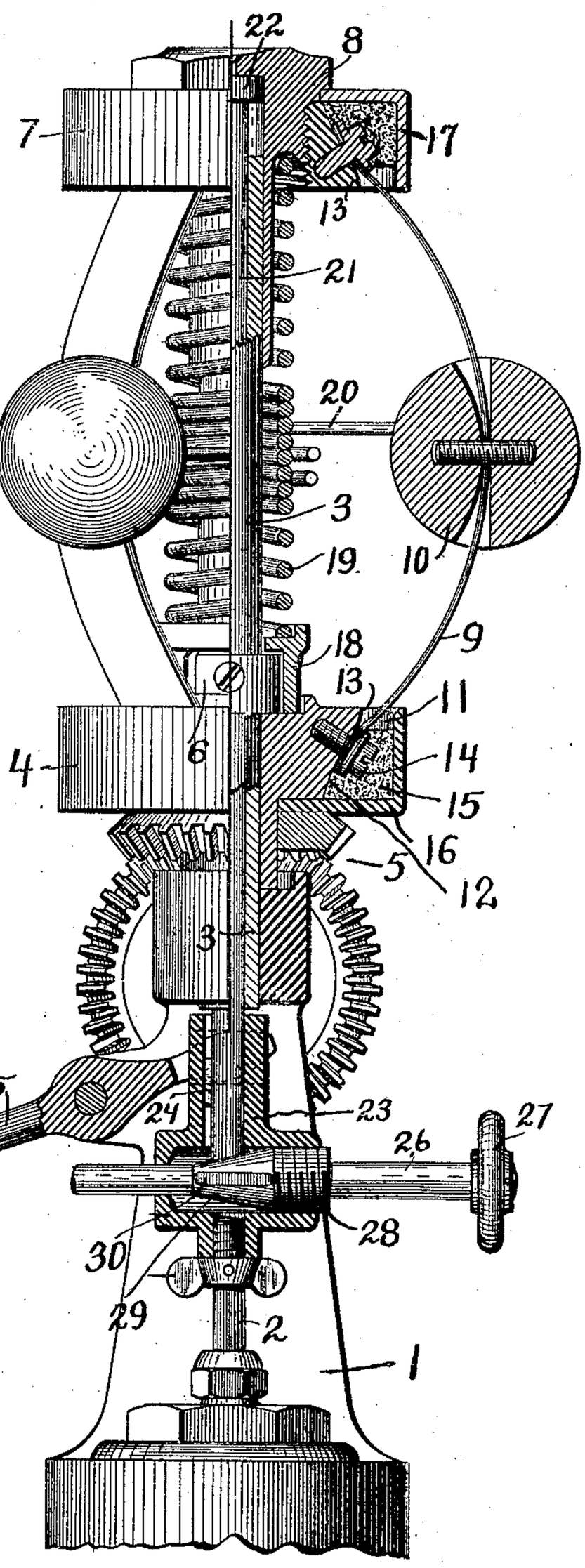

Witnesses:
Elmer R. Shipley.
M. S. Belden.

William N. Rumely
Charles N. Walsh
Inventors
by James W. See
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM N. RUMELY AND CHARLES N. WALSH, OF LAPORTE, INDIANA.

GOVERNOR.

No. 841,819. Specification of Letters Patent. Patented Jan. 22, 1907.

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To all whom it may concern:

Be it known that we, WILLIAM N. RUMELY and CHARLES N. WALSH, citizens of the United States, residing at Laporte, Laporte county, Indiana, have invented certain new and useful Improvements in Governors, of which the following is a specification.

This invention, pertaining to improvements in governors of the centrifugal class and spring-armed type, will be readily understood from the following description, taken in connection with the accompanying drawing, which is an elevation, part vertical section, of a governor embodying an exemplification of our improvements.

In the drawing, 1 indicates the usual housing to surmount the valve-body and support the motion-work; 2, the usual valve-stem projecting from the valve-body upwardly into the housing; 3, a hollow stud fixed in and projecting rigidly upward from the housing in the axial line of the valve-stem; 4, the whirl in disk form mounted for rotation on the lower portion of the stud; 5, the usual pair of gears for giving rotation to the whirl, one of the gears being fast with the whirl; 6, a collar secured to the stud just above the whirl to keep the latter from rising; 7, the governor-head in the form of a disk mounted for rotation and vertical reciprocation on the upper end of the stud; 8, a hollow plug screwed downwardly into the governor-head, the bore of this plug forming the sliding and rotating bearing of the governor-head upon the stud; 9, flat metallic springs, preferably laminated, their upper ends being secured to the governor-head and their lower ends being secured to the whirl, the head and whirl having their peripheries notched for the reception of the ends of the springs; 10, the governor-weights secured to the mid-portions of the springs; 11, the peripheral notches in the whirl and head for the reception of the ends of the springs; 12, the major portion of the inner wall of each of these notches, the same being generally concave in vertical aspect; 13, the upper extremities of these curved inner walls of the notches of the whirl and the lower extremities of the notches of the governor-head, these portions presenting convexities joining the concavities of the walls, the wall-surfaces against which the ends of the springs bear being thus each formed with a reversed curve; 14, screws securing the ends of the spring to the whirl and to the governor-head, the under surfaces of the heads being convex, so as to force the ends of the springs into fair engagement with the concavities of the notch-walls; 15, the usual lead filling in the notches outside the ends of the springs; 16, a cup inclosing the periphery and one face of the whirl, the flat flange of the whirl-cup coming down between the body of the whirl and the gear carried by the whirl; 17, a similar cup on the governor-head, its flat flange coming between the governor-head and the non-circular head of the plug 8, these cups closing the notches and retaining the lead filling and serving as a finish; 18, a cup loosely seated upon the whirl around the stud and inclosing the collar 6, the side wall of this cup being open or freely ported, so as to permit access to the set-screw securing the collar 6 to the stud; 19, a helical spring loosely surrounding the stud, its foot resting upon the top of cup 18 and its head engaging under plug 8 of the governor-head, the central portion of this spring being preferably closely wound; 20, the usual guards projecting inwardly from the governor-weights and going around the central portion of the spring 19 to limit the outward motion of the weights, the close coiling of the central portion of spring 19 serving to prevent the entanglement of the guards with the coils of the spring; 21, the governor-rod, disposed within the interior of the hollow stud and extending entirely therethrough; 22, a head on the upper end of this rod seating upwardly against plug 8; 23, a coupling uniting governor-rod 21 with valve-stem 2, the coupling being firmly secured, as by screwing, to the valve-stem, and the foot of the governor-rod 21 being arranged for vertical sliding motion in an upper socket in the coupling; 24, a key in the foot of the governor-rod engaging a keyway in the socket of the coupling, so that the governor-rod is prevented from rotation; 25, the usual lifter, to be actuated by the weight or spring to keep the head of the governor-rod up against the plug in the governor-head, this lifter in the present instance having forked engagement with the coupling 23; 26, a spindle projecting horizontally from the coupling; 27, a handle on the spindle by means of which it may be turned; 28, a threaded portion of the spindle screwing into the coupling; 29, a cone on the inner end of the spindle, the foot of the governor-rod rest-

ing on this cone, and 30 a circumferential series of flat facets on the cone where it is engaged by the governor-rod.

The threaded fit of plug 8 in the governor-head is of diameter exceeding that of the exterior of spring 19, the result being that by removing the plug the spring may be withdrawn upwardly through the governor-head.

The formation of the inner walls of the spring-receiving notches in the whirl and governor-head into reverse curves brings about the result that the attaching-screws draw the ends of the springs down fairly to the concavities of the walls, thus putting the springs under certain efficient strains, the convex portions 13 of the reverse curves permitting peculiar freedom to the play of the springs as the weights move inward and greatly increasing the durability of the springs at their ends or at the points where movements of the springs ordinarily tend most toward their destruction. The convexing of the under surfaces of the attaching-screws results in the drawing of the springs tightly down into the concavities of the grooved walls. The screw-heads may, if desired, be enlarged where they bear against the springs, and these enlargements may be in the form of integral parts of the screw-heads, or they may be in the form of loose washers either formed convex on their inner surfaces or else formed thin enough to yield to the influence of the convex screw-heads.

The central spring 19 is to be of sufficient tension to draw the governor-weights inward when the governor is at rest, and the result of this arrangement, in conjunction with the peculiar attachment of the ends of the springs 9, is that the springs possess practically all of the virtues of links.

The lower rim of cup 18 rests in a cup in the top of the whirl around stationary collar 16. The porting of the wall of this cup gives access to the set-screw of the collar and permits ready lubrication of the bearing of the whirl upon the stud and under the collar. The cups inclosing the whirl and governor-head give finish to these parts, and being secured thereto by their flat flanges may be fitted with sufficient looseness to permit of their ready removal when necessary in getting at the ends of the springs.

The coupling normally unifies the governor-rod and valve-stem at a certain joint length appropriate to a given engine speed. By moving the cone inwardly the joint length of these parts is increased, and by moving the cone outwardly the length is decreased in an obvious manner. The inward and outward adjustment of the cone is effected by screwing it into and out of the coupling. The flat facets of the cone on which the foot of the governor-rod rests serve as detents to prevent the accidental turning of the cone. The utilization of these facets for this purpose calls for the beveling of the lower end of the governor-rod where it rests on the cone, and this again calls for the non-rotation of the governor-rod relative to the coupling. This is provided for by the key 24. The lifter 25 in the present case engages the coupling and acts upon the valve-rod through the medium of the cone in the coupling. The length of the bearing of the foot of the governor-rod in the upper socket of the coupling should be sufficient not only to provide fair sliding bearing and to take care of the vertical variation due to the adjustment effected by the cone, but it is also well to have it of such additional length that in governors provided with automatic stop-motions the descent of the valve will not result in the improper withdrawal of the governor-rod from the coupling.

We claim—

1. A governor comprising a disk provided with a peripheral notch having its inner wall formed with concave and convex portions, a spring having its end fitted in said notch against the concave portion of said wall and free of its convex portion, and a screw drawing the end of the spring to the wall, combined substantially as set forth.

2. A governor comprising a peripherally-notched disk, springs having ends seated in the notches, a cup covering the periphery and one face of the disk, and means for holding the cup against the disk, combined substantially as set forth.

3. A governor comprising a hollow fixed stud, a whirl mounted to turn on the base thereof, a collar fixed on the stud above the whirl, a cup inclosing the collar and resting on the whirl, and a helical spring surrounding the stud and resting on the cup, combined substantially as set forth.

4. A governor comprising a valve-stem, a coupling secured thereto and having an axial socket, a governor-rod sliding in said socket, a cone fitted for endwise motion in the coupling at right angles to the governor-rod and supporting the same, and means for adjusting the cone endwise, combined substantially as set forth.

5. A governor comprising a valve-stem, a coupling secured thereto and having an axial socket, a governor-rod feathered in said socket, a cone fitted for endwise motion in the coupling at right angles to the governor-rod and supporting the same, and means for adjusting the cone endwise, combined substantially as set forth.

6. A governor comprising a valve-stem, a coupling secured thereto and having an axial socket, a governor-rod sliding in said socket, a cone fitted for endwise motion in the coupling at right angles to the governor-rod and supporting the same, and a screw connected with the cone for adjusting the cone endwise, combined substantially as set forth.

7. A governor comprising a valve-stem, a coupling secured thereto and having an axial socket, a governor-rod sliding in said socket, a cone fitted for endwise motion in the coupling at right angles to the governor-rod and supporting the same and provided with a series of facets to receive the foot of the rod, and a screw connected with the cone for adjusting the cone endwise, combined substantially as set forth.

8. A governor comprising a coupling having an upper and a lower socket, a valve-stem screwed into the lower socket, a governor-rod feathered in the upper socket, a spindle screwed into the socket at right angles to the rod, a handle on the spindle, and a faceted cone carried by the spindle and receiving the foot of the rod, combined substantially as set forth.

WILLIAM N. RUMELY.
CHARLES N. WALSH.

Witnesses:
AUGUST B. YEAMS,
A. J. RUMELY