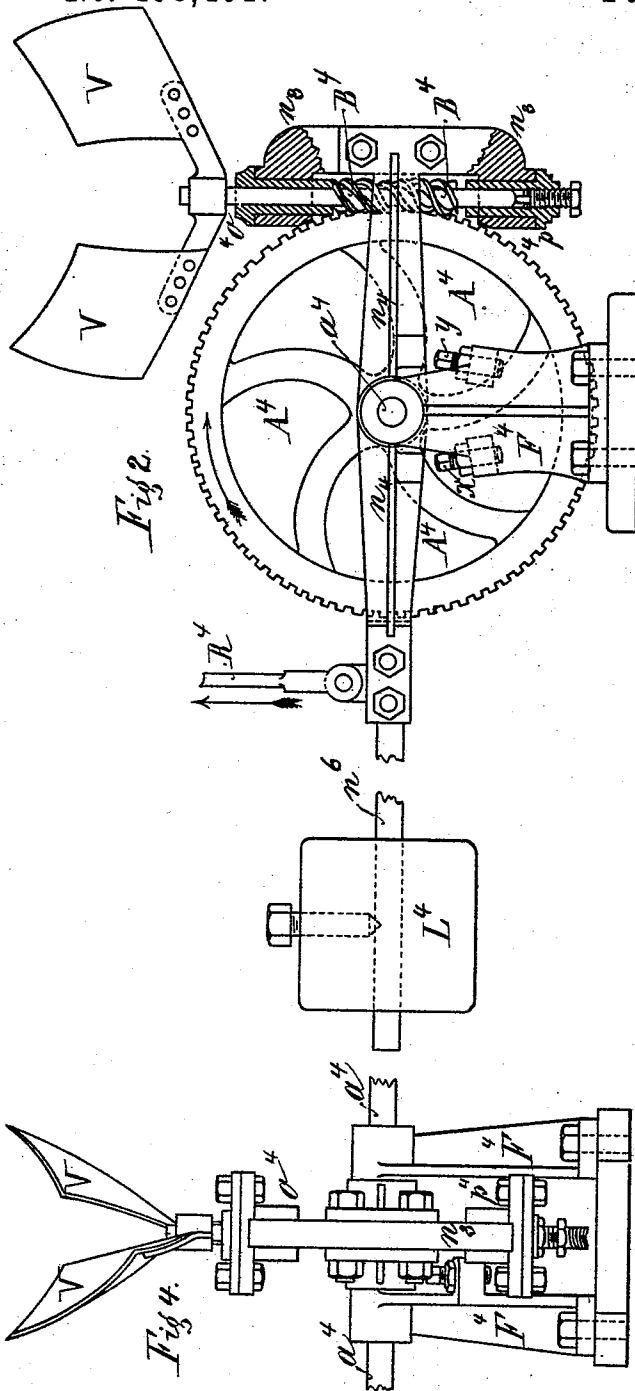


(No Model.)

P. LA COUR.
REGULATOR.

No. 498,461.

Patented May 30, 1893.



WITNESSES:
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UNITED STATES PATENT OFFICE.

PAUL LA COUR, OF ASKOVUS, DENMARK.

REGULATOR.

SPECIFICATION forming part of Letters Patent No. 498,461, dated May 30, 1893.

Application filed April 23, 1892. Serial No. 430,314. (No model.)

To all whom it may concern:

Be it known that I, PAUL LA COUR, a subject of the King of Denmark, residing at Askovus, Denmark, have invented certain new and useful Improvements in Regulators, of which the following is a specification.

The object of my invention is to provide a new and improved regulator for motors of all kinds, which regulator is so constructed as to keep the motor at a constant speed at all times.

The invention consists in the construction and combination of parts and details which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a diagrammatic side-view illustrating the principle of my improved regulator. Fig. 2 is a side-view of my improved regulator, parts being shown in section and others broken out. Fig. 3 is a plan-view of the same, parts being in section. Fig. 4 is an end-view.

Similar letters of reference indicate corresponding parts.

Referring to Fig. 1, A^2 is a worm-wheel, which is driven in the direction of its arrow by means of any suitable devices from a motor (not shown), and B^2 is a worm, which may be rotated from any other independent mechanism (not shown) by means of the crank r^2 . The bearings o^2 and p^2 of the worm are formed on a frame n^2 , which latter can turn on the axle a^2 of the worm-wheel, and the said frame n^2 is to be connected by the rod R^2 with the devices that control the motive force admitted to the motor in such a manner, that the speed of the motor is decreased when the rod R^2 is raised by the frame n^2 and increased when the rod R^2 and the frame n^2 are lowered. In case no rotary motion would be given to the worm B^2 and the worm-wheel A^2 would be rotated in the direction of its arrow, that part of the frame n^2 carrying the worm B^2 would be moved downward, and the end of the frame n^2 connected with the rod R^2 would be moved upward; and vice versa in the case of the wheel not receiving rotary motion and the worm B^2 be rotated, the result would be that the worm would travel upon the worm-wheel and thereby the rod R^2 would be moved downward. The motor is thus compelled to turn the worm-wheel A^2 the distance of as many

teeth as the worm makes rotations, as the greater speed of the worm-wheel would raise the rod R^2 , thereby decreasing the amount of power admitted to the motor; and a decreased speed of the worm-wheel A^2 would cause the rod R^2 to descend, whereby the motive force admitted to the motor would be increased.

The principle here described is applied in the device shown in Figs. 2, 3 and 4, in which F^4 F^4 are journal bearing blocks for the shaft a^4 of the worm-wheel A^4 . A forked lever n^4 is mounted to turn on the axle a^4 , and said fork consists of two arms, with which are connected means, such as a third arm n^6 for holding in suspense an adjustable wheel L^4 , and to the opposite end of said fork the piece n^3 is fixed, at the top and bottom of which bearings o^4 and p^4 for the worm-shaft B^4 are arranged. A constant resistance such as a fan having blades V is fixed on the upper end of said worm-shaft, the blades of said fan having preferably the shape of propeller wings. Stop-screws x and y on the bearing blocks limit the swinging movement of the lever n^4 . The rod R^4 which leads to the throttle valve of an engine or any other motor controlling device is connected with the arm n^6 . The shaft a^4 is rotated by means of a belt and pulley (not shown) from the motor in the direction indicated by the arrow in Fig. 2, whereby the worm and the fan on the same are rotated. The said fan at a certain speed counterbalances the weight L^4 and holds the arm n^6 in horizontal position. If work is taken from the motor and the speed of the latter thereby increased, there is a sudden burst of speed in the wheel A^4 and the same travels a few teeth forward on the worm, compelling the latter to move downward slightly, whereby the weight L^4 rises correspondingly and the valve admitting motive fluid to the motor is closed. At the same time, the fan immediately begins to rotate faster, producing on account of the shape of the fan-blades, an increased pressure on the step bearing, which pressure assists in raising the weight L^4 . If, on the contrary, work is added to the machine, the rotation of the wheel A^4 is decreased and consequently the speed of the fan is also decreased, and the fan is no longer able to counterbalance the weight L^4 , which will therefore descend and open the valve, admitting motive fluid to the

motor. In this manner a perfect regulation can be obtained, as the downward pressure of the fan always varies according to the speed of the motor. The wings V of the fan must have the shape of propeller wings, so as to drive the air upward and thereby effect an increase in the speed of the fan and a corresponding increase in pressure on the lower step-bearing p^4 of the worm, so that the weight L^4 can be increased without correspondingly increasing the pressure between the teeth on the worm-wheel and the threads of the worm, and without requiring the motor to do more work in that respect. A greater weight can thus be used and can very readily overcome the resistance to which the rod r^4 is subjected in opening and closing the valve. For marine engines the weight can be replaced by a spring.

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

1. In a motor regulator, the combination, with a constant weight and a substantially constant resistance, acting on each other, of means for holding said weight in suspense, which means are operated from the motor to be regulated in such a manner that the weight is raised when the speed of the motor is in-

creased, a lever acted upon by said weight, and means connected with said lever for acting on a part of the motor to be controlled, substantially as set forth.

2. In a motor regulator, the combination, with a worm-wheel, a lever mounted to turn on the shaft of the worm-wheel, a weight supported by said lever, a rod connected with said lever and leading to the controlling valve of the motor, a worm mounted in bearings on said lever, and engaging the worm-wheel, and a fan on the upper end of said worm, substantially as set forth.

3. The combination, with a worm-wheel, of a frame mounted loosely on the shaft of the worm-wheel, a worm mounted in said frame and engaging the worm-wheel, a resistance connected with said worm, and means connected with the frame for pulling that end opposite the one carrying the worm downward, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

PAUL LA COUR.

Witnesses:

G. HOFMAN-BARY,
FRITZ TÖNBERG.