

(No Model.)

P. LOCHMANN.

DEVICE FOR GOVERNING VELOCITY OF SPRING DRIVING MECHANISMS.

No. 584,003.

Patented June 8, 1897.

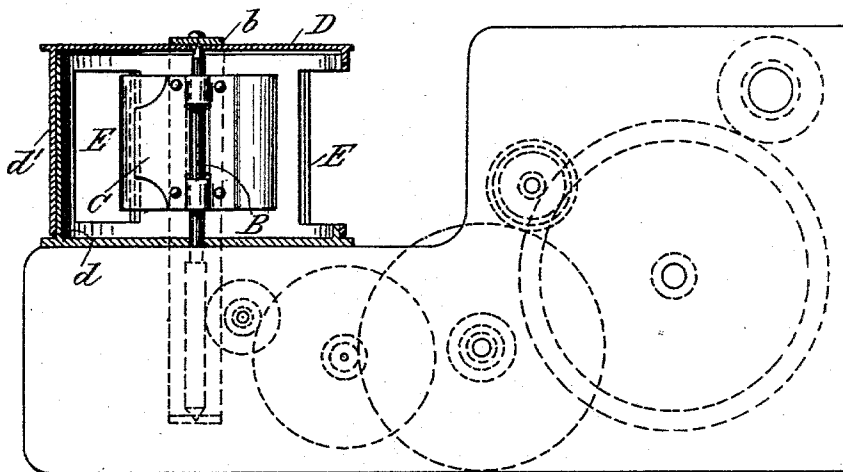
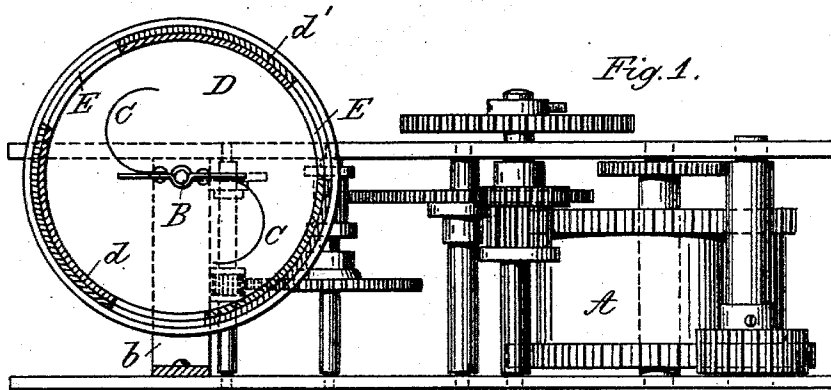


Fig. 2.

Witnesses
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PAUL LOCHMANN, OF LEIPSIC, GERMANY.

DEVICE FOR GOVERNING VELOCITY OF SPRING DRIVING MECHANISMS.

SPECIFICATION forming part of Letters Patent No. 584,003, dated June 8, 1897.

Application filed September 15, 1894. Serial No. 523,139. (No model.)

To all whom it may concern:

Be it known that I, PAUL LOCHMANN, a subject of the King of Saxony, and a resident of the city of Leipsic, in the Kingdom of Saxony, Germany, have invented a certain new and useful Device for Governing the Velocity of Spring Driving Mechanisms, of which the following is a specification.

This invention relates to an improvement in the regulators or governors of spring driving mechanism the velocity of which is regulated by air-vanes; and the object of the invention is to provide means for varying the velocity of the driving mechanism while the same is in motion and without the use of the ordinary brake, so that it may be caused to run at a slower or quicker speed.

The invention consists in the application of a casing, which may be so placed or slid over the vanes of the regulator as to increase or diminish the surrounding air-space. In the known air-vane regulators the air-vanes are set in rapid rotation from the spring driving mechanism through toothed gearing, the vanes, which are generally made of an elastic yielding material and of a curved or bent form, stretching out into a more and more flat or straight shape the quicker the velocity communicated to them from the driving mechanism. The more the vanes stretch out or take a straight shape the greater is the surface they present to the air and the greater also the air resistance to be overcome by them. The driving mechanism must then transmit more power in order to drive the air-vanes, because it has to overcome the resistance of the air to the outstretched vanes, and consequently it will run at a slower speed, which again has for result that the air-vanes rotate more slowly and return to their curved shape, presenting less surface to the air, whereupon the driving mechanism will again run at a quicker speed. In order to be able to vary the speed of spring driving mechanism provided with such air-vane regulators while said mechanism is running, it has been customary to employ brakes. These are the cause of many evils, the friction between the brake and the regulator-spindle very quickly wearing away the latter, and after long usage the spring-tension relaxes and the speed of the mechanism can no longer be regulated

with precision. By means of this invention the speed of the mechanism without the use of a brake can be regulated at will to run at a quicker or a slower speed.

It is clear that if in the rotation of the air-vanes the air resistance acting upon them can be lessened by regulating or shutting off the access of air to the same the driving of these will require less power and the driving mechanism will be less loaded, and therefore must work at a higher velocity. Now by locating the air-vanes in a casing provided with closable apertures I am enabled by more or less or entirely closing the apertures to more or less or entirely shut off the access of air to the vanes. When the casing inclosing the air-vanes is completely closed, a certain quantity of air remains shut up therein. This inclosed air is set in rotation by the vanes, in the movement of which it must take part, and therefore opposes only a slight resistance or no resistance. The vanes will then rotate with the velocity that is transmitted to them from the driving mechanism without this being retarded by said vanes and may run at its highest velocity. If now the apertures in the casing are slightly opened, so that outside air can enter therein, the air-vanes will keep on drawing fresh air, whereupon they have always to keep on overcoming the resistance of the freshly-entering air. Therefore the mechanism in order to drive the air-vanes must transmit more power to them, and consequently run at a slower speed, owing to its being retarded by the air resistance against the vanes. If, on the other hand, the apertures in the casing are fully opened or if the air-vanes are located in a free-air space, they will have to overcome the fresh air continuously flowing thereto, and thus drive forward a maximum quantity of air. Now in order to drive forward this maximum quantity of air the driving mechanism must transmit a corresponding power to the air-vanes, and consequently as it has to overcome the air resistance against the vanes cannot run at its highest but only at a slower speed.

It is obvious that if the air-vane or fan-governor has to overcome a great resistance or to act upon or draw a larger quantity of air, and therefore to perform more work, so must the driving mechanism be retarded, and

thus run slower than if the governor has to overcome a smaller resistance; further, that the air-vane governor when located in a closed casing likewise sets in rotation the inclosed air, so that this travels round with the air-vanes, and therefore opposes either no resistance or only quite a small one, in consequence of which the driving mechanism has not to overcome any resistance and may run at its highest velocity. On the other hand, if the casing is opened, so that air can enter it, the driving mechanism will run slower, because it has to oppose the resistance of the air coming against the vanes.

15 In the drawings, Figure 1 is a top view of a spring driving mechanism with the casing surrounding the air-vanes of the regulator in horizontal section. Fig. 2 is a side view of the driving mechanism with the casing in vertical section.

20 A is a driving mechanism of a known kind, operated by a spring or its equivalent and from which the spindle B, carrying the air-vanes of the regulator, is driven. The regulator is located within the casing D, consisting of two cylinders d d' , slid the one within the other. The outer cylinder d' is fixed by screws to the bracket b , in which also is carried the upper point of the regulator-spindle B, while the inner cylinder is movable. Both cylinders are provided with apertures E. By turning round the inner cylinder d the apertures of both of the cylinders may be brought at once or gradually to meet, so as to afford full through communication, or said apertures may be partly or completely closed. When

the apertures of the one cylinder meet those of the other, there is then a free air-space round the regulator, which then draws in or is acted upon by the maximum quantity of air and thus has in its rotation to overcome the maximum resistance, the effect being that the driving mechanism runs at the slowest speed. When by turning round the inner cylinder d the apertures are partly closed, the air-vanes C will draw less air and have to overcome less resistance, the result being that the speed of the driving mechanism is increased. If, on the other hand, the apertures are completely closed, so as to shut off the regulator from the outer air, the resistance to be overcome by the air-vanes C will be little or none, the result being that the driving mechanism runs at the quickest speed.

What I claim as my invention, and desire to secure by Letters Patent, is—

In a device for governing the velocity of spring driving mechanism, the combination of an air-vane regulator with a casing surrounding the regulator and a movable slide within the casing, said casing being provided with air-apertures which may be more or less closed or completely opened by means of the movable or inner slide, for the purpose specified, substantially as described and shown.

In testimony whereof I sign this specification in the presence of two subscribing witnesses.

PAUL LOCHMANN.

Witnesses:

GVE. LOCHMANN,
RUDOLPH FRICKE.