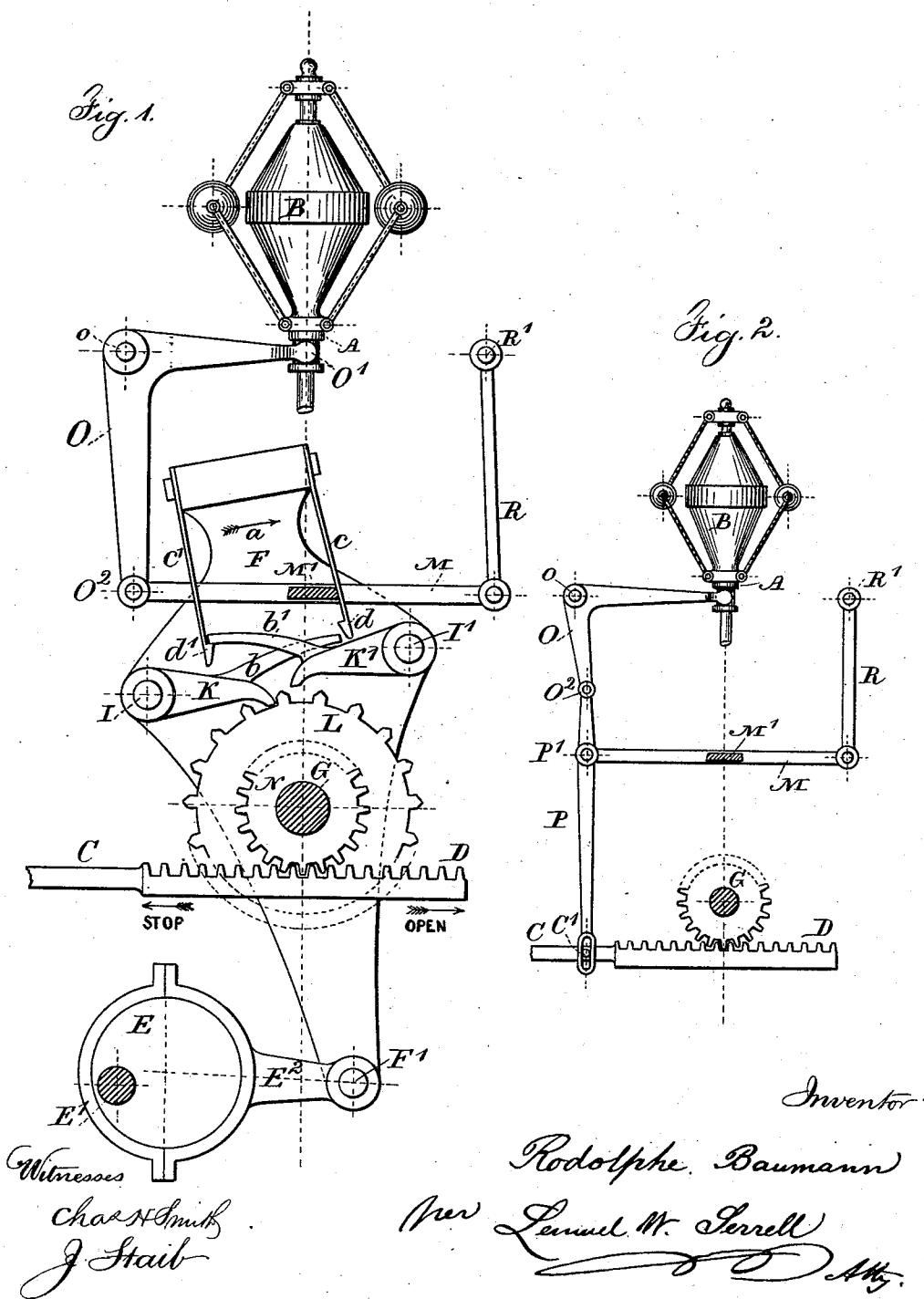


(No Model.)

R. BAUMANN.
GOVERNOR.

No. 472,690.

Patented Apr. 12, 1892.



UNITED STATES PATENT OFFICE.

RODOLPHE BAUMANN, OF GENEVA, SWITZERLAND.

GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 472,690, dated April 12, 1892.

Application filed December 31, 1891. Serial No. 416,690. (No model.) Patented in Switzerland January 15, 1890, No. 1,773; in France January 24, 1890, No. 201,977, and in Italy July 8, 1890, No. 27,493/249.

To all whom it may concern:

Be it known that I, RODOLPHE BAUMANN, engineer, of Geneva, Switzerland, have invented certain new and useful Improvements in Governors, (for which Letters Patent have been granted to me in Switzerland, dated January 15, 1890, No. 1,773; in France, dated January 24, 1890, No. 201,977, and in Italy, dated July 8, 1890, No. 27,493/249,) of which the following is a specification.

The throttle-valves of steam-engines, as well as the flood-gates of hydraulic motors, generally have a greater resistance to motion than the usual ball-governor or centrifugal governor is able to overcome. Therefore there have been combined several devices intended to cause the said resistance to be overcome by the force of the motor itself, the centrifugal force of the ball-governor being then merely applied to cause the said mechanism to be acted upon by the motor. This constitutes the so-called "indirect transmission of a governor."

The aforesaid mechanism, intended to cause the resistance of the throttle-valve or flood-gate to be overcome by the motor itself, may be composed either of a valve or its equivalent, admitting steam or water under pressure to act upon a suitable piston, or a coupling device (belt-coupling, friction-coupling, ratchet-wheel, or the like) may be employed.

The conditions which are to be realized by the said mechanism are the following: First, the resistance which the centrifugal governor has to overcome must be as small as possible; secondly, the mechanism must be capable of overcoming even a very great resistance of the throttle-valve or flood-gate; thirdly, the action of the coupling device must be a very rapid one.

My invention consists of such a coupling device realizing to a high degree the above-mentioned conditions.

In the following specification I will describe a governor of my system as being intended to act upon the flood-gate of a hydraulic motor; but it is to be understood that the same devices may be used in combination with the throttle-valve of a steam-engine or with any other regulating device whatever.

In the accompanying drawings, Figure 1 is

a diagrammatic elevation of the governor; and Fig. 2, a somewhat different arrangement of part of the same, shown at a smaller scale.

B is a centrifugal or ball governor, and A is its socket, which is raised or lowered, according as the speed of the motor increases or decreases.

CD is the rod which acts upon the throttle-valve or flood-gate and which is provided on part of its length with suitable rack-teeth, as shown.

E is an eccentric, which is fixed upon an axis E', rotated by the motor or by a connection to said motor. Said eccentric E is connected by means of a rod E² to the point F' of a rocking or oscillating lever F, which is loose upon an axis G, preferably placed in the same vertical plan as the axis of the governor B. To the axis G there are affixed a click or ratchet wheel L and a gear-wheel N, the latter gearing with the above-mentioned teeth of the rod CD. The lever F is provided with pivots I and I', bearing clicks or ratchets K and K', having projections or fingers b and b' and being intended to alternately act upon the click or ratchet wheel L.

To the rocking lever F there are further fixed two springs c and c', provided with hooks d and d', to which the above-mentioned projections or fingers b and b' of the clicks or ratchets K and K' are generally hooked. In the drawings said piece F is shown as having its upper part rocked to the left, whereby the finger b' of click K' is hooked to the spring-hook d' of the piece F. There is further provided a crank-lever O, pivoted to a fixed point o and having its one end O' in the socket A of the ball-governor B and its other end O² connected to the one end of a horizontal or nearly-horizontal rod M, the other end of which is connected to a link R, pivoted to a fixed point R'.

The horizontal or nearly-horizontal rod M bears a projection M' between the springs c and c' and horizontally displaced to the right or to the left, according as the socket A of the governor B is lifted or lowered by the centrifugal force, and causes the crank-lever O to oscillate about its pivot o. Now if, for instance, the click K, being unhooked from the spring c, as shown in Fig. 1 of the drawings,

bears upon the click or ratchet wheel L the lever F is moved in the direction indicated by an arrow *a* by the action of the eccentric E. The click K will turn the wheel L in the same direction. When the eccentric E in its further rotation causes the inverse movement of the lever F, the top of the latter being then moved from right to left, the click K will then be lifted by the teeth of the wheel L and its projection or finger *b* will be hooked to the spring-hook *c d*. From this it appears that after either of the clicks K or K' has been unhooked from its spring-hook *c d* or *c' d'* by any means whatever it will act upon the wheel L if it is moving forward, or it will be hooked again to the corresponding spring-hook if it is moving backward. When hooked to their corresponding spring-hooks, the said clicks are out of reach of the click-wheel L and do not act upon the same in any way. The described device having thus the tendency to be put out of action, it appears that the intervention of an external cause is necessary to put the same into action. The external cause is the above-mentioned projection or cam M' of the rod M, which projects between the two springs *c* and *c'*, and which is acted upon by the centrifugal governor B in the manner specified above. The length of the projection or cam M' is such as to have said cam or projection not in the path either of the spring *c* or of the spring *c'* in the course of the oscillation of the piece F as long as the said cam or projection M' is in its middle position—that is to say, so as to have its central point in the vertical plane containing the geometrical axis of the arbor G, but to meet either with the spring *c*, as shown in Fig. 1, or with the spring *c'* when said cam or projection M' is displaced either to the right or to the left by the action of the ball-governor B. If, for instance, the said cam or projection M' has been displaced to the right, as shown in Fig. 1, the spring *c* will meet the same when the lever F is oscillating in the reverse direction to the arrow *a*, and the hook *d* of said spring *c* will be disengaged from the projection *b* of the click K. The latter, falling then down upon wheel L, causes the said wheel L to be rotated from left to right as soon as the lever F begins to oscillate again into the direction shown by the arrow *a*. The action of the click K upon the wheel L will be continued as long as the cam or projection M' is displaced to the right, and as soon as the spring *c* ceases to meet with said cam or projection M' the finger *b* of click K will be caught again by the hook *d* in the left oscillation of the top of the lever F.

The springs *c* and *c'* can be made very weak, so that the stress which the governor B has to overcome in putting the described devices into action is very small. On the other hand, the clicks K and K' engaging very completely

with the bottom of the teeth of wheel L they transmit as considerable a force as desired to overcome the resistance of the throttle-valve or flood-gate by means of the rack C D. The rapidity of action of the said device is also apparent. Fig. 2 of the drawings shows, for instance, how the said cam or projection M may be moved by the combined action of the ball-governor B and of the sliding rod C D. In this construction the rod M is connected in the point P' to a lever P, which is suspended to the vertical arm of the crank-lever O and the lower end of which is provided with a slot, in which engages a pin C', fixed to the rod C D. The displacements of the pin C' will be proportional to those of the point O² of the crank-lever O—that is to say, the movements of the socket A of the ball-governor are reproduced in an amplified or reduced proportion to the rod C D, according to the position of the point P' upon the lever P.

I do not limit myself to the means shown for imparting motion from the clicks or pawls to the throttle-valve or regulator, as these may be of any suitable character as long as they are adapted to be moved by the said clicks or pawls. Neither do I limit myself to the devices shown in Fig. 1 for giving motion to the cam or projection M from the governor, as these may be of any desired character.

I claim as my invention—

1. The combination, with a centrifugal governor and a connection for moving the throttle-valve or regulator, of clicks standing in opposite directions, mechanism for moving them first in one direction and then in the other, teeth against which the clicks act to move the regulator of the motor, fingers upon the clicks, spring-hooks to engage the fingers and hold the clicks out of action, and a sliding cam and connection to the centrifugal governor to disengage either one spring-hook or the other, substantially as specified.

2. The combination, with the centrifugal governor, of a lever F, mechanism for rocking the same, clicks pivoted upon the lever and standing in opposite directions, teeth against which the clicks act, and connections to move the throttle-valve or regulator in one direction or the other, fingers on the clicks, spring-hooks to hold the clicks out of action, and a projection and connections from the same to the centrifugal governor for moving one spring-hook or the other from its click to allow the latter to come into action, substantially as specified.

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

RODOLPHE BAUMANN.

Witnesses:

E. IMER-SCHNEIDER,
G. PRENTICE NAYLOR.