

No. 696,065.

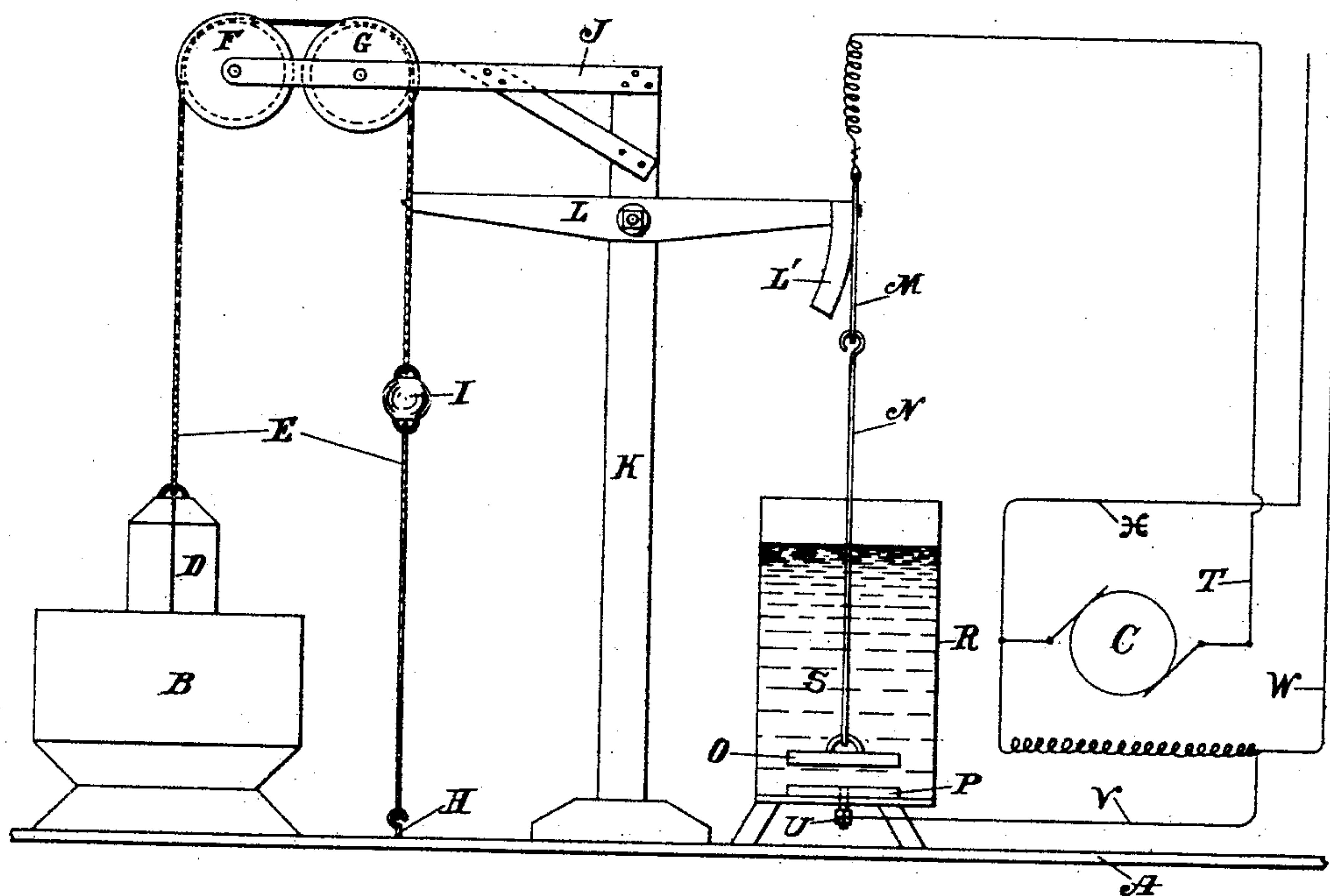
Patented Mar. 25, 1902.

H. L. MILLER.

AUTOMATICALLY CONTROLLED RHEOSTAT FOR USE IN ELECTRIC MOTOR CIRCUITS.

(Application filed Nov. 7, 1901.)

(No Model.)



WITNESSES

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UNITED STATES PATENT OFFICE.

HAROLD L. MILLER, OF PASADENA, CALIFORNIA.

AUTOMATICALLY-CONTROLLED RHEOSTAT FOR USE IN ELECTRIC-MOTOR CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 696,065, dated March 25, 1902.

Application filed November 7, 1901. Serial No. 81,504. (No model.)

To all whom it may concern:

Be it known that I, HAROLD L. MILLER, a citizen of the United States, residing at Pasadena, in the county of Los Angeles, State of California, have invented certain new and useful Improvements in Automatically - Controlled Rheostats for Use in Electric-Motor Circuits, of which the following is a specification.

My said improvements have been devised with special reference to their use in connection with an electric motor for operating the bellows of a pipe-organ, and is described herein and illustrated in the accompanying drawing, which is a side elevation of my rheostat as applied to said purpose.

In the utilization of the electric motor to pump air for the bellows of pipe-organs great trouble has been experienced in controlling the motor so as to furnish the requisite amount of air to the bellows of the organ. Sometimes an excess of air would be pumped into the bellows, and sometimes there would not be enough. With my improved automatically-controlled rheostat this difficulty is avoided.

In the drawing, A represents a fragment of the floor of the structure in which the device is located.

B is the bellows of the organ, into which air is pumped in the usual manner by an air-pump, (not shown,) which pump is operated by motor C. Above the bellows is the larger resistance-operating weight D, which is held suspended by the flexible cord E. This cord passes over idler-pulleys F and G and is affixed to hook H in the floor. Attached to cord E above hook H is the smaller resistance-operating weight I. Pulleys F and G are mounted in arm J, which is affixed to the upright support K, attached to the floor. Pivotaly attached to support K is rock-lever L, to one end of which is affixed cord E and to the other end of which is affixed a flexible metallic tape M. To the lower end of tape M is affixed a metallic rod or wire N, on the lower end of which is affixed a movable metallic circuit-plate O. Any resilient metallic support for plate O may be used for tape M and wire N. Immediately below plate O is a second or fixed metallic circuit-plate P, which is affixed to the bottom of a receptacle R, of glass or other non-conducting substance,

which receptacle is almost filled with water S or other resistance fluid. To the top of tape M is affixed wire T, the other end of which is attached to the motor. To plate P is attached binding-post U, which provides attachment to wire V, which wire connects with the main or feed circuit-wire W. X is the other main or feeding circuit-wire.

In the operation of my rheostat circuit-plates O and P are adjusted in the resistance fluid a sufficient distance apart to give the motor-operating circuit its ordinary desired capacity to cause the motor to operate the pump so that it will furnish the necessary air for the organ. Now when the motor is started it pumps air into the bellows until they are partially expanded, so as to bring the top of the bellows in contact with the larger of the resistance-operating weights. Now if any more air is pumped into the bellows they are still further expanded, which raises the larger weight and releases its strain on the end of the rock-lever, to which the cord is affixed. The weight of the smaller resistance-operating weights then draws this end of the lever toward the floor and causes the elevation of the other end of the lever, which carries the movable circuit-plate farther away from the fixed circuit-plate, thereby causing the interposition between the circuit-plates of a greater quantity of resistance fluid, and thereby shutting off the feed of the motor and reducing its power. Before the bellows are expanded to their full capacity the full feed of the motor is cut off and it ceases to work. As the air is used out of the bellows the larger of the resistance-operating weights descend until the circuit-plates are again in their normal position. It will be observed by this construction an organ can be pumped by an electric motor and that the amount of air pumped thereby is automatically controlled to the required quantity.

In the foregoing construction I have described an arrangement of parts which I have found in practice works well; but it is obvious that other arrangements of elements may be used without departing from the spirit of my invention, which consists of two circuit-plates in and forming part of the circuit by means of which the motor is fed, one of which is movable, the movable circuit-plate being

caused to recede from the other plate when the top of the organ-bellows rises above a predetermined point, and thereby reduce the current which operates the motor to reduce its speed and power, and as the top of the organ-bellows lowers toward the predetermined point to cause the plates to approach each other, and thus increase the speed and power of the motor. The rock-lever is provided with a downwardly-projecting segmental arm L' to cause a vertical movement of the movable circuit-plate. These circuit-plates should be constructed of the same kind of conducting substances. In practice iron has been found to be very satisfactory.

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

1. A rheostat for use in an electric-motor circuit for controlling a motor used in operating a pipe-organ, comprising a non-conducting receptacle; a resistance fluid in said receptacle; a fixed circuit-plate in the bottom of said receptacle, connected to and in the feed-circuit of the motor; a movable circuit-plate suspended in said resistance fluid by a resilient metallic support, affixed to one end of a rock-lever; a circuit feed-wire attached to said metallic support at one end and to the motor at the other end; a cord affixed at one end to the floor and passing up and af-

fixed to the end of the rock-lever opposite to the circuit-plate support, thence up to and over a pulley and down upon the other side thereof and terminating above the organ-bellows; a larger rock-lever-operating weight affixed to the free end of said cord; a small rock-lever-operating weight affixed to said cord intermediate the rock-lever and the end thereof attached to the floor.

2. The combination of a pipe-organ bellows, an electric motor adapted to pump air for use in said organ-bellows and a rheostat for use in the motor-circuit, said rheostat comprising a non-conducting receptacle; a resistance fluid in said receptacle; a fixed circuit-plate in the bottom of said receptacle connected to and forming part of one of the circuit feed-wires; a movable circuit-plate suspended above the fixed circuit-plate by the circuit feed-wire, and forming part of said line; and means to cause the movement of the movable circuit-plate away from and toward the fixed plate upon the rise and fall of the organ-bellows.

In witness that I claim the foregoing I have hereunto subscribed my name this 31st day of October, 1901.

HAROLD L. MILLER.

Witnesses:

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MATTIE MCGINNIS.