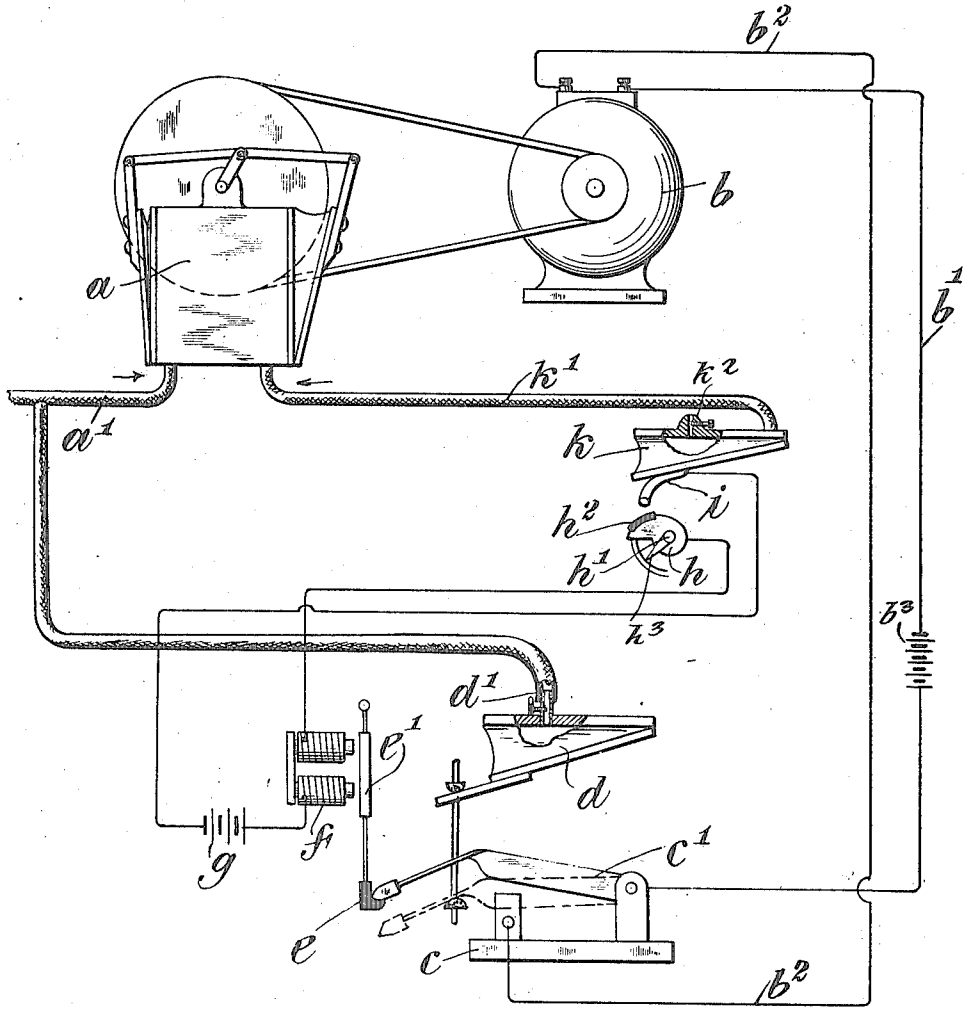
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AUTOMATIC CONTROLLING DEVICE FOR THE MOTORS OF PNEUMATICS.

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1,270,382. Patented June 25, 1918.



WITNESS

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AUTOMATIC CONTROLLING DEVICE FOR THE MOTORS OF PNEUMATICS.

1,270,382. Specification of Letters Patent. Patented June 25, 1918.

Application filed June 27, 1916. Serial No. 106,098.

To all whom it may concern:

Be it known that I, JOHN A. WESER, a citizen of the United States, residing in the borough of Manhattan of the city of New York, in the State of New York, have invented certain new and useful Improvements in Automatic Controlling Devices for the Motors of Pneumatics, of which the following is a specification, reference being had to the accompanying drawing, forming a part hereof.

This invention relates to devices for automatically initiating the operation of a motor for a pneumatic or air pump at a predetermined time and is concerned particularly with the provision of such a device as will be operable at predetermined periods of time for initiating operation of such a motor at fixed intervals of time. The invention is designed with particular reference to its application to the motor of an air pump intended to actuate either the pneumatics of a player piano or the pneumatics for controlling the operations of a graphophone. The desirability of having suitable automatic devices for instituting the operation of either a player piano or a graphophone at stated time intervals and without especial manipulation on the part of the operator will be appreciated. In accordance with the invention, the time interval controlling device is of such a character as to come into play automatically at predetermined periods and close the circuit of the actuating motor for the air pump, thereby bringing about the actuation of the appropriate pneumatics for the performance of their intended functions. This device having acted automatically in the manner described is operative automatically, upon the completion of the operation of the motor for a suitable period, to interrupt the circuit of the motor at the same time that it is being reset for a succeeding operation. The automatic control described may be effected by many different devices, as will be more evident as the detailed description of the illustrated embodiment proceeds, but it has been found in practice, that this illustrated embodiment is particularly adaptable to a pneumatic system for controlling the operations of a graphophone. Further objects and advantages of the invention will be pointed out hereinafter in connection with the description of the accompanying drawing, which shows, somewhat schematically, a time interval playing device embodying the invention.

The air pump a, shown somewhat conventionally in the drawing, may be of any approved character for creating a pressure differential throughout the penumatic system, when operated by the illustrated motor b, to effect the collapsing of the appropriate pneumatics for the performance of their intended functions, as, for instance, in the case of a graphophone, for the control of its operations. Where the pump a is used in association with a player piano, of course, its effect will be to actuate or to control the operation of the usual player pneumatics. In a simple form of the invention, the leads b', b^2 of the motor b, including a suitable source of current b^3, lead to a master knife switch c, the movable member c' of which may be raised out of engagement with the post c by a delayed action pneumatic d, the conduit d' of which is connected operatively with the main conduit a' of the pump, to the end that the pneumatic may be collapsed slowly and, after the lapse of a suitable interval of time, withdraw the blade c' from the knife switch c and so open the circuit of the motor. When the blade c' is thus raised, it is engaged by a detent e, the action of which is determined by a timing device. As shown it may be formed on a pivoted armature e' of an electromagnet f, this armature being so disposed with relation to the magnet that when the latter is energized the detent will be moved out of engagement with the blade c' and the latter permitted to drop to close the circuit of the motor b. The circuit of the magnet f includes a source of power, such as a battery g and the leads are connected at their ends to two switch members h and i, respectively. One of these terminals i is carried on the movable member of a pneumatic k, the conduit k' of which may be operatively connected to the pump a for the collapse of the pneumatic whenever the pump is operated. The other terminal h of the leads of the magnets f is formed conveniently as an eccentric whereby, by rotation of the eccentric on its shaft h', the distance

between its edge and the terminal i can be changed readily by the operator for a reason which will appear.

In operation, it may be supposed that it is desired to operate the pump a at predetermined time intervals for the carrying on of some series of operations by means of the pneumatics connected in the pneumatic system with the pump. For instance, where the pump a is the source of power in a pneumatic system for controlling the operations of a graphophone, it might be desired to have these operations repeated at stated intervals of time to initiate successively the playing of a record or records. The operator may determine the interval of time which he desires between these playing operations and set the eccentric h with its edge in such relation to the terminal i on the moving member of the pneumatic k as to require the elapse of such interval of time during the slow expanding of the pneumatic k to a point where the moving terminal i will be carried into engagement with the edge of the eccentric h and thereby complete the circuit of the electromagnet. This setting of the eccentric h may be arranged for conveniently as by mounting on its shaft h' a pointer h^3 which may move over the face of a scale graduated appropriately into time units. With the eccentric thus set, the motor b may be started in any convenient manner, as by manual relase of the detent e, whereupon the pump a will act to bring about, at the proper time, the complete collapse of the pneumatic d and retraction of the switch blade c' for the interruption of the circuit of the motor b, whereupon the pump a will stop. The time of operation of this pump is sufficiently long to effect its intended function. Of course, immediately upon the actuation of the pump the pneumatic k will be collapsed. This pneumatic has a bleed nipple k^2 of such proportions as to cause a relatively slow expanding of the pneumatic after the actuation of the pump a has been stopped. However, the pneumatic will steadily expand and eventually carry the movable terminal i into electrical engagement with the edge of the eccentric h, thereby energizing the magnets f and causing the attraction of the armature e' and release of the switch blade c' by the detent e. The switch c' will then drop so as to close the circuit of the motor b and thereby initiate operation of the pump a. The operations described will then be repeated and so, by determining the relative position of the edge of the eccentric h with relation to the moving terminal i, any desired interval of time may be permitted to elapse between the successive playing of a record or records, where the improvements are applied to a graphophone.

Along a portion of the edge of the eccentric h there may be secured an insulating strip h^2 and this strip may be moved, by movement of the eccentric, to a position where it will be engaged by the moving terminal i, as may be desirable when the automatic time interval devices are not to be employed.

As suggested hereinbefore, the appended drawing is intended merely to illustrate, somewhat schematically, suitable devices for accomplishing the desired automatic control of an air pump in a pneumatic system supposed to be associated with suitable controlling pneumatics for the operations of a graphophone. Where the invention is used in association with an air motor intended to effect the control of pneumatics for other purposes, as in a player piano, it may be necessary to change the details of construction of various of the elements and their relative disposition to one another. Further, even where the stated functions are to be accomplished in connection with the control of a graphophone many changes may suggest themselves to one skilled in the art. However, in practice, where the system is entirely pneumatic in character, it has been found convenient to connect some such pneumatic as is shown at k directly to the pump a for initiating time interval playing operations.

The scope of the invention will appear from the appended claims.

I claim as my invention:

1. In combination with an air pump, an electric driving motor therefor, a switch to control the motor, means to open the switch, devices operable automatically to initiate the closing of the switch after a definite lapse of time and means to control the time interval.

2. In combination with an air pump, an electric driving motor therefor, a switch to control the motor, means operated by the pump to open the switch, devices operable automatically to initiate the closing of the switch after a definite lapse of time and means to control the time interval.

3. In combination with an air pump, an electric driving motor therefor, a switch to control the motor, a pneumatic connected with the pump and operatively connected with the switch, devices operable automatically to initiate the closing of the switch after a definite lapse of time and means to control the time interval.

4. In combination with an air pump, an electric driving motor therefor, a switch to control the motor, means operated by the pump to open the switch, a pneumatic connected with the pump and devices operable automatically by said pneumatic to initiate the closing of the switch.

5. In combination with an air pump, an electric driving motor therefor, a switch to

control the motor, means operated by the pump to open the switch, a pneumatic connected with the pump and having retarded expansion and electromagnetic devices controlled by said pneumatic to initiate the closing of the switch.

6. In combination with an air pump, an electric driving motor therefor, a controlling switch for the motor including a movable member, a pneumatic connected operatively to the pump and having its movable member operatively connected to the movable member of the switch for controlling the latter, electromagnetic devices to control the position of the said movable switch member and devices operable automatically for initiating operation of the electromagnetic devices.

7. In combination with an air pump, an electric driving motor therefor, a controlling switch for the motor, a detent to hold the switch in inactive position, electromagnetic devices for controlling the detent, terminals for the circuit of the electromagnets and a pneumatic connected to the pump on the movable member of which one of said terminals is carried, the other terminal being relatively stationary, whereby upon expansion of the pneumatic the terminals are brought into engagement with one another.

8. In combination with an air pump, an electric driving motor therefor, a controlling switch for the motor, including a movable member, a pneumatic operatively connected with the pump and the movable member to break the circuit when the pump is actuated, a detent to hold the switch open, electromagnetic devices to control the detent having terminals, and a second pneumatic connected to the pump and on the movable member of which is carried one of said terminals, the other of said terminals being adjustable with respect to the first named terminal.

This specification signed this 23d day of June, A. D. 1916.

JOHN A. WESER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."