(No Model.)

G. E. TURNER.

ELECTRIC VALVE CONTROLLER.

No. 449,889. Patented Apr. 7, 1891.

Fig. 1.

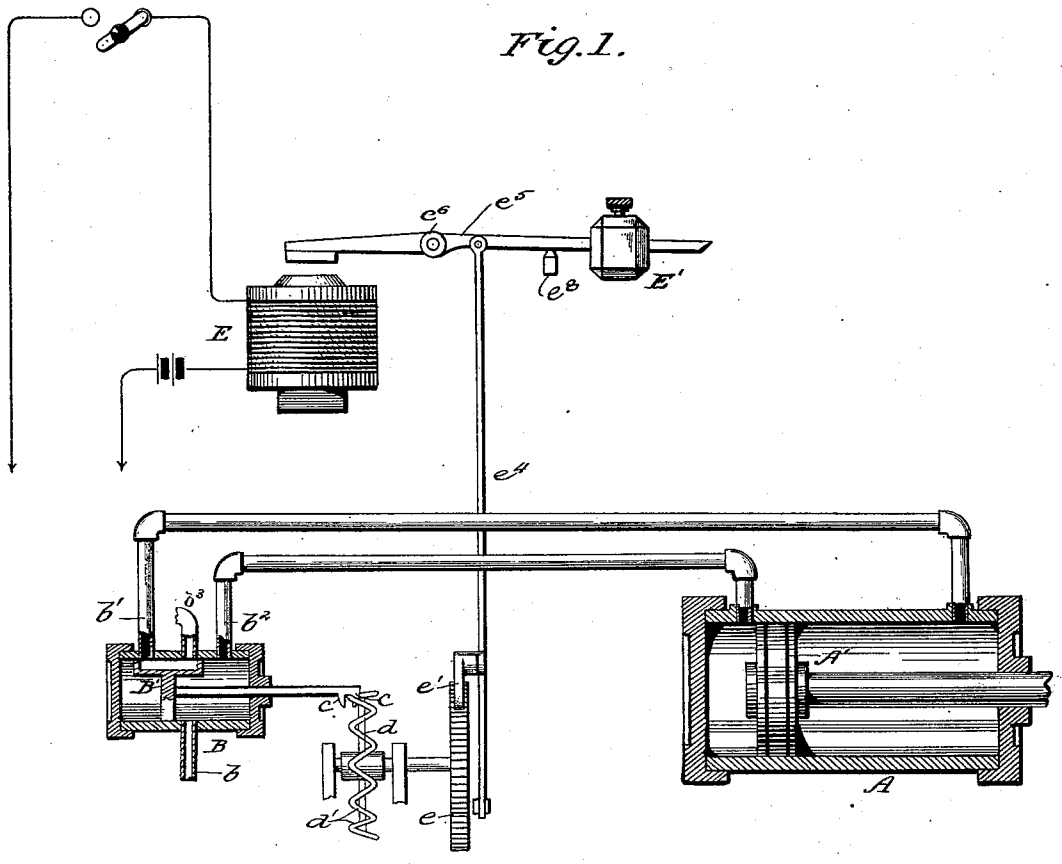


Fig. 2.

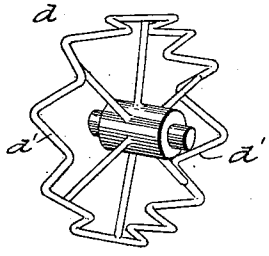
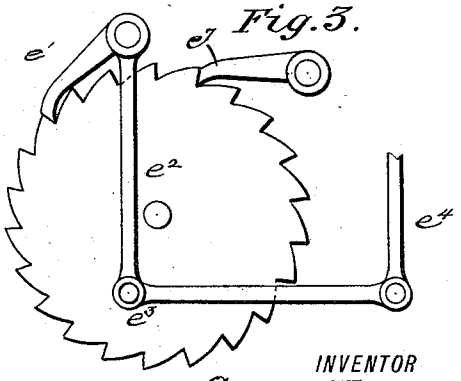


Fig. 3.



WITNESSES:

Paul S. Ober.

Thomas K. Trenchard.

INVENTOR

George E. Turner.

BY

W. J. Johnston

ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE E. TURNER, OF MARION, OHIO.

ELECTRIC VALVE-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 449,889, dated April 7, 1891.

Application filed August 12, 1890. Serial No. 361,790. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. TURNER, a citizen of the United States, residing in Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in Electric Valve-Controlling Mechanism, of which the following is a specification.

My invention relates to valve-controlling mechanism, the object being to provide an apparatus of this nature which shall be as simple in construction as possible, cheap of manufacture, and at the same time efficient in operation.

The invention consists in the combination, with a valve, of a peculiarly-constructed wheel operating with a step-by-step movement to reciprocate the valve, and an electro-magnetic apparatus for imparting to such wheel the said step-by-step movement.

In the accompanying drawings, Figure 1 represents conventionally the apparatus which I employ. Fig. 2 represents a detail perspective view of the valve-throwing wheel, and Fig. 3 is a detail view of the ratchet *e*.

Referring to the drawings by letter, A represents a cylinder, to the opposite ends of which a fluid under pressure is to be admitted to move the piston A′.

B represents a valve-chamber, and B′ a valve or piston therein, having a stroke back and forth past the inlet-port *b*, and alternately establishing communication between two outlet-ports b' b^2 and the inlet-port *b* and exhaust-port b^3. The ports b' b^2 communicate, respectively, with the ends of cylinder A. The stem of valve B′ extends through a stuffing-box through the head of the chamber B, and on its outer ends has attached to it two lugs *c c*, with a small space between them. A peculiarly-shaped wheel *d* is arranged in suitable bearings near the end of the valve-stem and its rim or perimeter stands in the space between the two lugs *c c* on the valve-stem. The rim of this wheel is zigzagged or made up of a series of inclined planes *d*′. This wheel has a step-by-step movement on its axis, and as it progresses the inclined planes *d*′, coming in contact with first one and then the other of the lugs *c*, move the valve in and out the full extent of its movement each time, thus alternately directing the fluid which it controls through the passages b' b^2. The wheel *d* may be a continuous piece of sheet metal, or its rim may be a wire bent into the shape shown. It is mounted on a shaft with a ratchet-wheel *e*, having teeth equal in number and length to the inclined planes of the wheel *d*. A pawl e' engages with the teeth of the ratchet. It is pivoted to one end of the bell-crank lever e^2, which in turn is supported upon a pivot at e^3. The opposite end of the bell-crank connects with the rod e^4, attached to armature-lever e^5 pivoted at e^6. An electro-magnet E throws the armature-lever e^5 in one direction and a weight E′ throws it in the opposite direction. The circuit of the electro-magnet may be complete metallic or ground return. I prefer the latter, however. The circuit-closer may be located in any convenient place desired, thus permitting of the operation of the valve at a distance. Each time the circuit is closed the wheel *e* is moved forward one notch, thereby carrying the wheel *d* and sliding the valve in one direction. My apparatus will of course comprehend a pawl e^7 for holding the ratchet-wheel against backward movement, and a step e^8 for limiting the movement of the armature-lever. It will thus be seen that my apparatus is extremely simple and is applicable to any form of valve in which a reciprocating movement is necessary.

Having thus described my invention, I claim—

1. The combination, with a sliding valve and its stem, the latter provided with two lugs, of a wheel having a zigzag rim located between the lugs, and an electro-magnetic apparatus for imparting a step-by-step movement to the wheel, substantially as described.

2. The combination, with a valve and its stem, the latter provided with two lugs, of a wheel *d*, having a zigzag rim, the ratchet-wheel *e*, mounted on the shaft therewith and having teeth corresponding in number and length to the inclined portions of wheel *d*,

pawl e' operating the ratchet-wheel, bell-crank lever e^2 connected with the pawl and with the armature-lever of an electro-magnet, the electro-magnet E, and its armature for moving the lever in one direction, and the weight E′, for moving it in the other direction, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE E. TURNER.

Witnesses:
JOHN A. WALFORD,
FRED E. GUTHERY.