

J. W. BECKWITH.
ELECTRICAL VALVE.
APPLICATION FILED SEPT. 30, 1912.

1,090,902.

Patented Mar. 24, 1914.

Fig. 1.

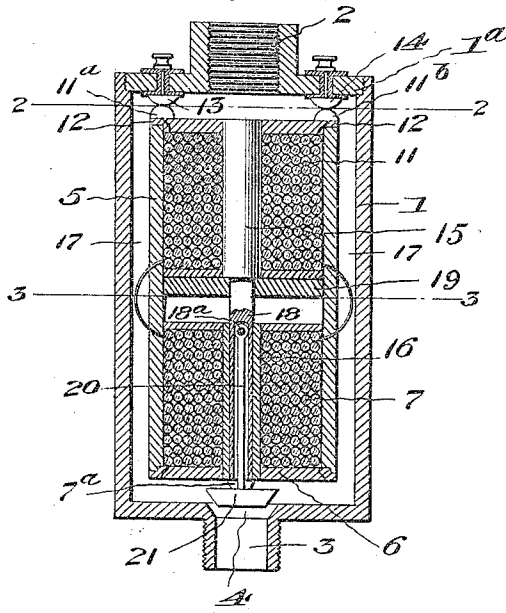


Fig. 2.

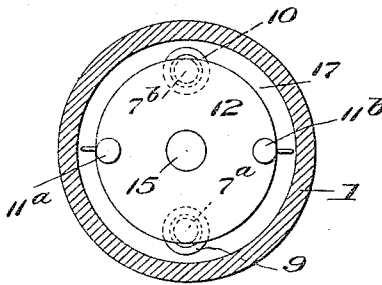
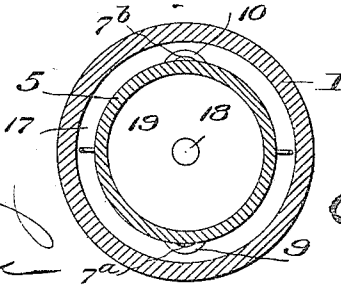


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN W. BECKWITH, OF SPOKANE, WASHINGTON, ASSIGNOR OF ONE-HALF TO H. A. & L. D. HOLLAND COMPANY, OF SPOKANE, WASHINGTON, A CORPORATION OF WASHINGTON.

ELECTRICAL VALVE.

1,090,902.

Specification of Letters Patent.

Patented Mar. 24, 1914.

Application filed September 30, 1912. Serial No. 723,103.

To all whom it may concern:

Be it known that I, JOHN W. BECKWITH, a citizen of the United States, residing at Spokane, county of Spokane, and State of Washington, have invented certain new and useful Improvements in Electrical Valves, of which the following is a specification.

This invention relates to electrical valves.

The present invention has for its object the provision of an improved electrically operated valve of simple, inexpensive, durable, and reliable construction, adapted for controlling the flow of gases, air, steam and other fluids which can be used when in any position, and will maintain either open or closed position by the utilization of a temporary electrical current without the employment of springs, moving electrical contacts, locks, catches, ratchets or other similar appliances which are liable to get out of order.

The invention consists in electro-magnets adapted for independent energization, permanent magnets under the control thereof, a valve and an armature for said valve which is under the control of the magnets aforesaid.

In the accompanying drawings: Figure 1 is a vertical section; Fig. 2, a cross section on line 2—2, Fig. 1; and Fig. 3, a cross section on line 3—3, Fig. 2.

The outer cylindrical shell 1, which is preferably of non-magnetic material, has screw threaded couplings 2 and 3 for connection to the pipe sections through which the gas, air, steam or other fluid is to pass and is provided with a valve seat 4 at one end and a screw threaded head 1^a at its other end.

Located within the shell 1 is a metallic shell 5, preferably of iron, which has a removable end 6 on which the electro-magnet coil 7 rests, the terminals of said coil being connected to contact buttons 7^a, 7^b on end 6 which engage contact buttons 9 and 10 on shell 1, which are insulated from shell 1. In the other end part of the shell 5 is an electro-magnet coil 11 which is held by a removable head 12, the terminals of said coil being secured to buttons 11^a, 11^b, on head 12 which engage contact buttons 13 and 14 both insulated from, but connected to shell 1. The coils 7 and 11 are differentially wound, that is, the greatest number of layers of the coil 7 are connected in series to a

lesser number of layers of coil 11 and vice versa. Extending centrally within coils 11 and 7 are the solid steel core 15 and the tubular steel core 16; the former being secured to the head 12 and the latter to the head 6. Slidable within the core 16 is a stem 18 to which is attached a disk armature 19 which is adapted to play between the poles of the cores 15 and 16. Pivoted to stem 18 at 18^a is a valve stem 20 carrying valve 21 which is adapted to rest in seat 4 when the armature 19 is attracted by the pole 16. By pivoting the stem 20, the proper seating of the valve 21 is insured. The buttons 7^a, 7^b, are at right angles to buttons 11^a, 11^b, so that by tightening the head 1^a, the shell 5 is securely clamped in position, being surrounded by the gasway 17. The valve is preferably arranged to open against the flow of gas, air, steam or other fluid, to assist in its closing operation, but when the device is arranged vertically, gravity also assists in the closing operation. The device may be arranged vertically, horizontally, or in any other position without interfering with its operation.

When the coil 11 is energized, its core attracts the armature and opens the valve, the permanent magnetism of the core holding the valve open. When the coil 7 is energized, the armature is attracted by the core thereof and the valve closed, the permanent magnetism of said core keeping the valve closed until the coil 11 is again energized.

Any suitable switch mechanism and circuits can be used to control the respective coils 7 and 11. Instead of winding the coils 7 and 11 differentially, each may be wound as an ordinary electromagnet and included in a separate, switch-controlled circuit.

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

1. In an electrical valve, the combination with an outer shell provided with a valve seat, of an inner shell of smaller size than the outer shell, independent electromagnet coils contained within said inner shell, permanent magnet cores for said coils, a bodily movable and slidable armature adapted to play between the ends of the coils, a valve adapted to bear on said seat, and a valve stem connecting said valve and armature and extending loosely through one of the cores, said permanent magnet cores retain-

ing the armature when attracted by them and thereby maintaining the valve where positioned.

2. In an electrical valve, the combination
5 with an outer shell provided with a valve seat, of a detachable clamping head for said shell, contact members on the shell and also on the detachable head aforesaid, and a self-contained electrically operated valve mechanism located within the shell but also bodily
10 removable therefrom whose valve is adapted to cooperate with the seat aforesaid, said

valve mechanism being provided with contact members respectively adapted to engage all of the contact members aforesaid, the electrically operated valve mechanism being clamped within the shell by the detachable head. 15

In testimony whereof, I hereunto affix my signature in presence of two witnesses.

JOHN W. BECKWITH.

Witnesses:

H. A. HOLLAND,

L. D. HOLLAND.

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