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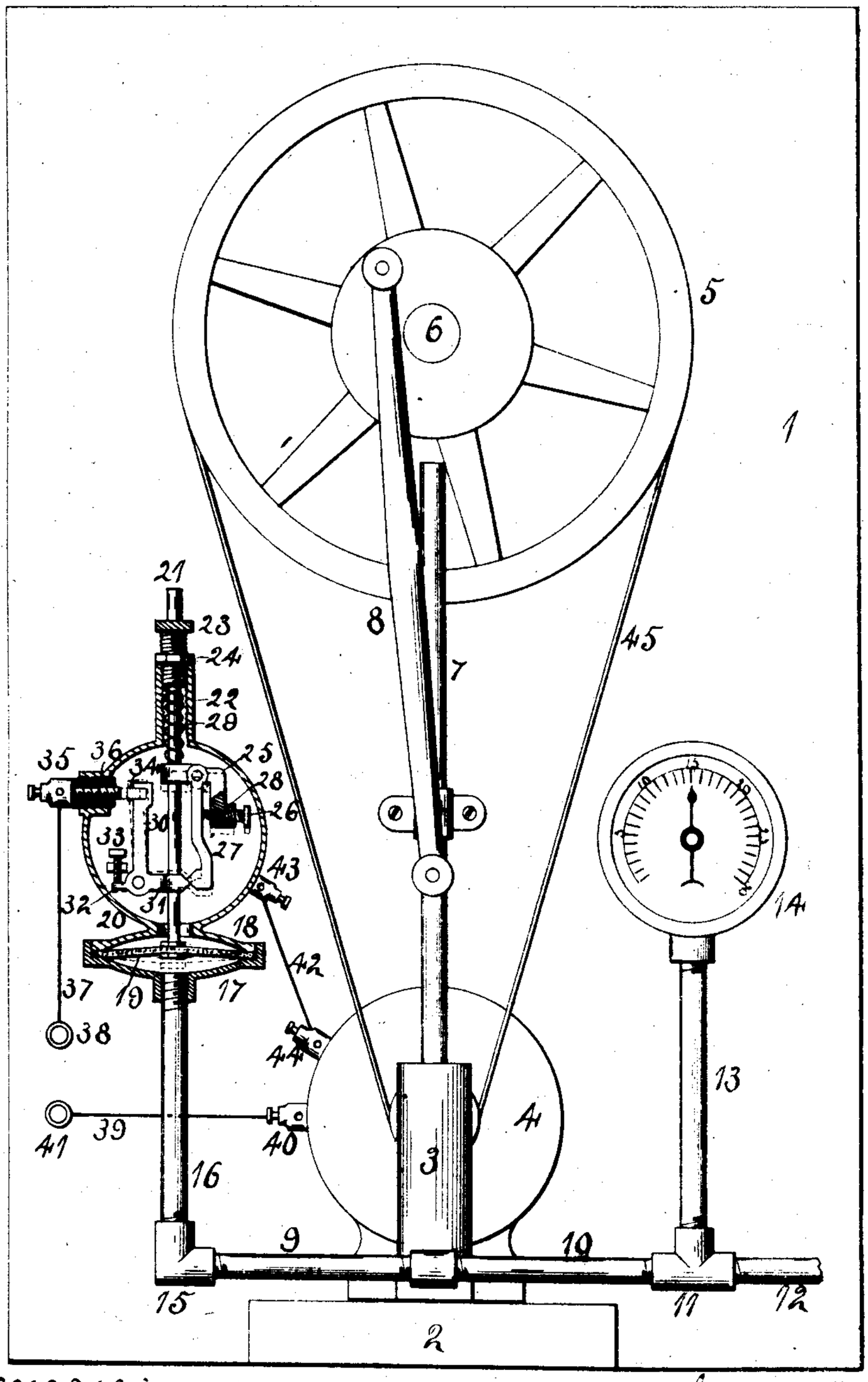
C. F. SPERY.

PRESSURE REGULATOR.

(Application filed Jan. 25, 1902.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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PRESSURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 713,251, dated November 11, 1902.

Application filed January 25, 1902. Serial No. 91,177. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SPERY, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Pressure-Regulators, of which the following is a specification.

The object of this invention is to construct a regulator for air or water pressure and an automatic switch controlling the power supplying the air or water.

In the accompanying drawing is shown a face representation of my improvements.

In this instance the parts going to make up my system are supported by a base 1. A cleat 2 is secured to the base-board and supports a pump 3 and electric motor 4. A wheel 5 is supported by the stud 6, extending from the base-board. A piston-rod 7 has a connection with the wheel 5 by the link 8. Pipes 9 and 10 connect with the lower end of the pump. The pipe 10 has a T 11, and the pipe 12 leads to the place of use. A pipe 13 connects with the T and supports a gage 14. The pipe 9 supports an elbow 15, to which is connected a section of pipe 16. The upper end of the pipe 16 supports a casing for a diaphragm and switch mechanism. The casing for the diaphragm is in two parts 17 and 18, having a screw-threaded connection. A diaphragm 19, of elastic material, is supported by the casing. The upper section of the diaphragm-casing has the casing 20, containing the switch mechanism, connected thereto. This switch mechanism comprises the rod 21, connected to the diaphragm and extending upward through the casing. The upper portion of the casing has a tubular extension 22, internally screw-threaded, and a plug 23 has a screw-thread connection with the extension and its central opening forms a guide for the rod. A lock-nut 24 holds the plug against accidental movement. To the rod 21 is secured a bracket 25, having its free end perforated and internally screw-threaded. A plug 26 has a screw-thread connection with the opening i the bracket 25. To the bracket 25 is pivoted an arm 27, having its free end pointed in wedge shape. A coiled spring 28 is located in the opening in the bracket 25 and bears against the arm 27, the plug 26 serving to vary the pressure of the spring against the arm. A coiled spring 29 surrounds the rod 21, one end resting against the bracket 25 and the other end against the plug 23 and the plug serving to vary the tension of the spring. On the opposite side of the rod 21 to the arm 27 is pivoted a bell-crank lever composed of the arms 30 and 31 and the extension 32. A set-screw 33 serves as a stop, against which the extension comes in contact. The free end of the arm 30 supports a hardened point 34, and the free end of the arm 31 is pointed in wedge shape.

The casing 20 supports a binding-post 35, having a screw-threaded shank 36. This binding-post and shank are insulated from the casing. A wire 37 connects the binding-posts 35 and 38. A wire 39 connects the binding-post 40 connected with the motor with the binding-post 41, and a wire 42 connects the binding-posts 43 and 44.

With the parts in the position shown in the drawing in solid lines the electric circuit will be broken between the shank 36 and point 34 and the pointed end of the arm 27 will bear against the upper surface of the pointed end of the arm 31, thereby holding the circuit open. In this position the air-pressure is at its height. When the pressure has lowered sufficiently so that the pointed end of the arm 27 passes the pointed end of the arm 31, the force of the spring 28 will force the arm 27 over sufficiently to move the bell-crank arm and cause the circuit to be closed. Upon the circuit being closed through the wire 27, post 35, point 34, arm 30, the casing by wire 42 through the motor, and by wire 39 to the supply the motor will be operated, which will drive the pump through the belt 45, connecting the motor and wheel 5, and when sufficient air has been pumped to bring the pressure up to the required amount the pointed end of the arm 27 will pass the pointed end of the arm 31 of the bell-crank lever, and the spring 28 will force the arm 27 against the upper face of the arm 31, forcing the contact-points apart, breaking the circuit, and stopping the motor and the pumping of air. By this arrangement a quick make and break is had, which is necessary to prevent the formation of an arc.

My improvements are equally applicable to pumping water.

I claim as my invention—

The combination of a support, a diaphragm held by the support, a casing connected to the support, a stationary contact-point insulated from the casing, a screw-threaded rod connected to the diaphragm, a spring surrounding the rod, an adjusting-screw for the spring, a pivoted bell-crank lever, and an arm carried by the rod engaging the bell-crank lever, one arm of the bell-crank lever adapted to be moved into contact with the stationary contact-point.

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