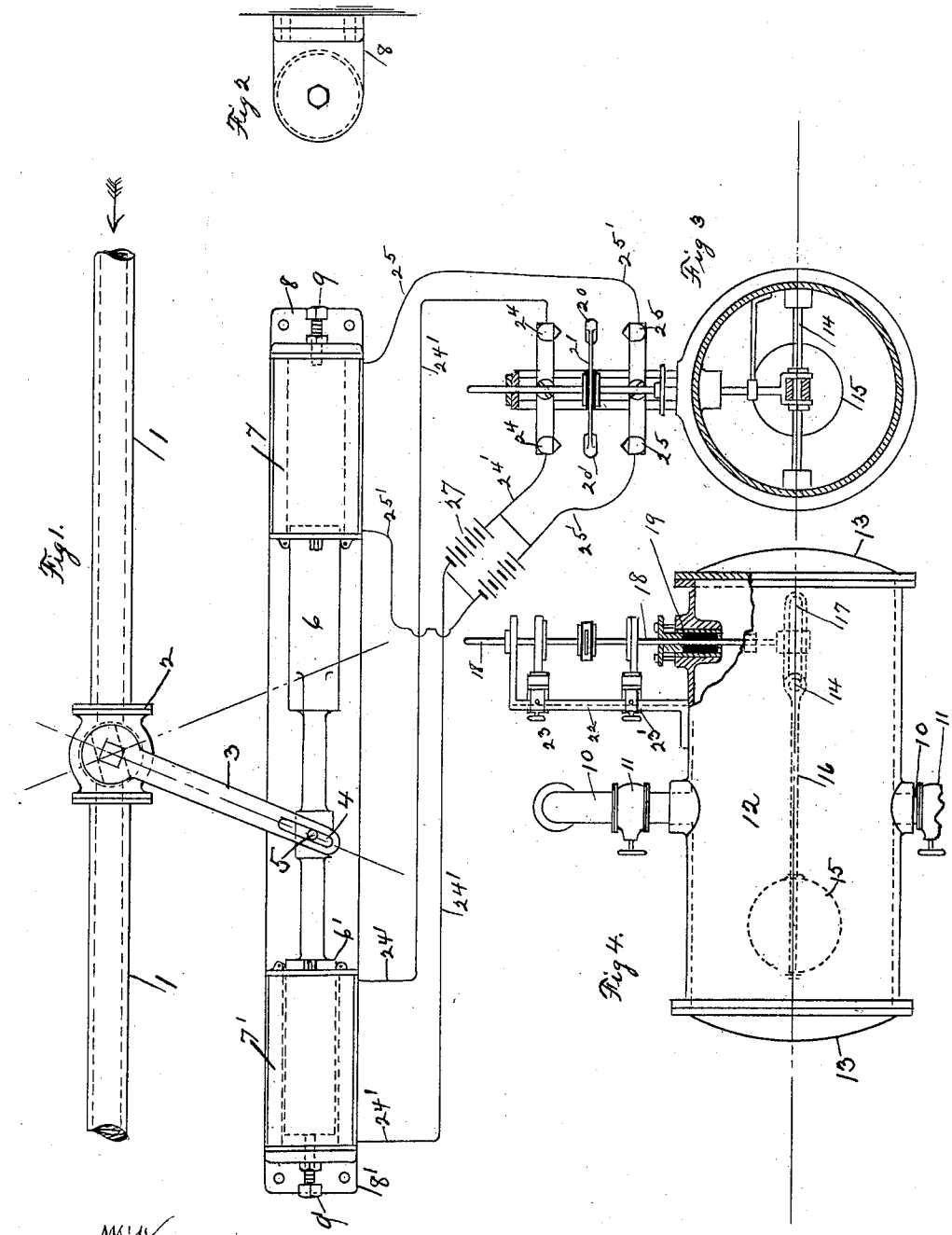
(No Model.)

A. E. MACCOUN & J. NOEY.

AUTOMATIC ELECTRIC FEED WATER REGULATOR.

No. 603,650. Patented May 10, 1898.



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UNITED STATES PATENT OFFICE.

ANDREW E. MACCOUN AND JOHN NOEY, OF BRADDOCK, PENNSYLVANIA.

AUTOMATIC ELECTRIC FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 603,650, dated May 10, 1898.

Application filed December 3, 1897. Serial No. 660,689. (No model.)

To all whom it may concern:

Be it known that we, ANDREW E. MACCOUN and JOHN NOEY, citizens of the United States, residing at Braddock, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Electric Feed-Water Regulators for Steam-Boilers; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates to an improved automatic electrically-operated feed-water regulator for steam boilers or generators; and it consists in a device whereby the water-level in a boiler may be maintained at any given point, as will be fully described hereinafter.

In the accompanying drawings, Figure 1 is a plan view of the feed-water pipe and valve, together with solenoid for operating said valve. Fig. 2 is an end elevation of the said solenoid and frame. Fig. 3 is a sectional end elevation of the cylinder in communication with the boiler, showing the float and its connected adjustable mechanism for making and breaking the circuits to the solenoids, said view being connected by conductors to Fig. 1. Fig. 4 is a side elevation of the same, a part of which is shown in section.

To construct an adjustable automatic electrically-operated feed-water regulator in accordance with our invention, and thereby provide a device by means of which the water in a boiler or steam-generator may be maintained at or between certain levels, we provide the feed-water pipe 1 with a valve 2 of suitable construction and connect to the same a lever 3, having a slotted extremity 4, adapted to be attached to a double magnet 6 6′ by means of a pin 5. This double magnet 6 6′ operates in connection with two electric magnetic coils 7 7′ for the purpose of forming what is known in the art as "solenoid." These solenoids 7 7′ are mounted on a suitable frame 8 of any desired form suitable for the purpose. Arranged at the outer extremities of each of the solenoids 7 7′ are adjusting-screws 9 9′, which may be adjusted to limit the operation of the magnets 6 for a purpose hereinafter described.

Attached to and communicating with the boiler (said boiler not shown) by means of suitable pipes 10, provided with valves 11, is a cylinder 12, the longitudinal center of which is on a level with the normal water-level of the boiler. This cylinder 12 consists of an annular shell filled with suitable end caps 13 and having arranged therein a float or hollow sphere 15, attached to a horizontal rod 16 and pivoted to a transverse shaft 14 in a manner that will permit the said float to rise and fall with the water. Integral with this rod 16 is a slotted portion 17, which is loosely connected to a vertically-arranged shaft 18, extending through a stuffing-box 19 and provided with a transverse bar 21, insulated from the rod or shaft 18.

Attached to the top of the cylinder 12 is a frame 22, in which the rod or bar 18 finds a bearing, and the said frame having adjustable pieces 23 23′, carrying contact-strips 24 25, the one arranged above the other and adapted to be brought separately in contact with the contacts 20 20′ by the rise and fall of the float 15. These contacts 24 25 are connected by electrical conductors 24′ 25′ to the magnetic coils or solenoids 7 7′ and in circuit with a suitable battery 27, dynamo, or other electric generator.

In operation should the water-level in the boiler fall the same level would be found in the cylinder 12 through the medium of the pipes 10, thereby causing the float 15 to fall, which movement would elevate the slotted end 17 of the rod or bar 16, connected to the float. This vertical movement would be transmitted to the bar 18 and bring the parts 25 in contact with the contacts 20′ to complete the circuit to the battery 27 and solenoid 7, this circuit above mentioned commencing at the battery 27, through the conductor 24′ to bar 24, through bar to conductor 24′, leading to the coil or solenoid 7′, forming a magnet of the same, and back to the battery. This magnet will draw the core 6′ into the coil and in so doing shift the lever 3 to open the valve 2 and admit a supply of water to the boiler. This valve 2 will remain open until the water reaches the specified level, as prearranged by

the adjustment of the contacts 24 25. Should the water rise above the required level in the boiler, the contacts 25 would be brought in contact with the parts 20′ and a circuit completed to the other solenoid 7′ and shift the lever 3 in an opposite direction to close the valve 2.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a feed-water regulator for steam-boilers, the combination with a cylinder connected with a boiler, a float arranged in said cylinder upon one end of a lever, a vertically-movable rod secured to the other end of said lever and carrying a pair of contact-points and a standard mounted upon the top of the cylinder carrying two pairs of contact-points and having arms in which said rod is guided, of the two solenoids having electrical connection with the two pairs of contact-points and adapted to operate to close or open a feed-water-pipe valve.

2. In a feed-water regulator for steam-boilers, the combination with a cylinder connected with a boiler, a float and rod movably mounted therein, a standard secured to the top of the cylinder and carrying two pairs of contact-points, and a vertically-movable rod mounted in said standard having its lower end connected to one end of the float-rod and carrying a pair of contact-points located thereon between the pairs of contact-points on the standard, of the two solenoids each of which has a separate electrical circuit between each pair of contact-points of the standard, said electrical circuits being operated by the float to open or close a valve in a feed-water pipe.

3. In a feed-water regulator, the combination with a cylinder secured on a pipe leading from a boiler to indicate the amount of water in the boiler, means therein operated by the rise and fall of the water, a rod carried by said means and carrying a pair of contact-points and adapted to be raised or lowered by said means, a bracket carrying two pairs of contact-points, said pairs each being on opposite sides of the pair carried by said movable rod and each pair adapted to cause an electric circuit when contacted by said single pair on the movable rod in its ascent or descent, of a pair of oppositely arranged and operated solenoids which move in the same direction simultaneously when the circuits are completed by the regulating means to open or close a valve in a feed-water pipe as the water is needed in the boiler.

In testimony whereof we affix our signatures in presence of two witnesses.

ANDREW E. MACCOUN.
JOHN NOEY.

Witnesses:
W. A. McDEVITT,
W. L. MOOK.