

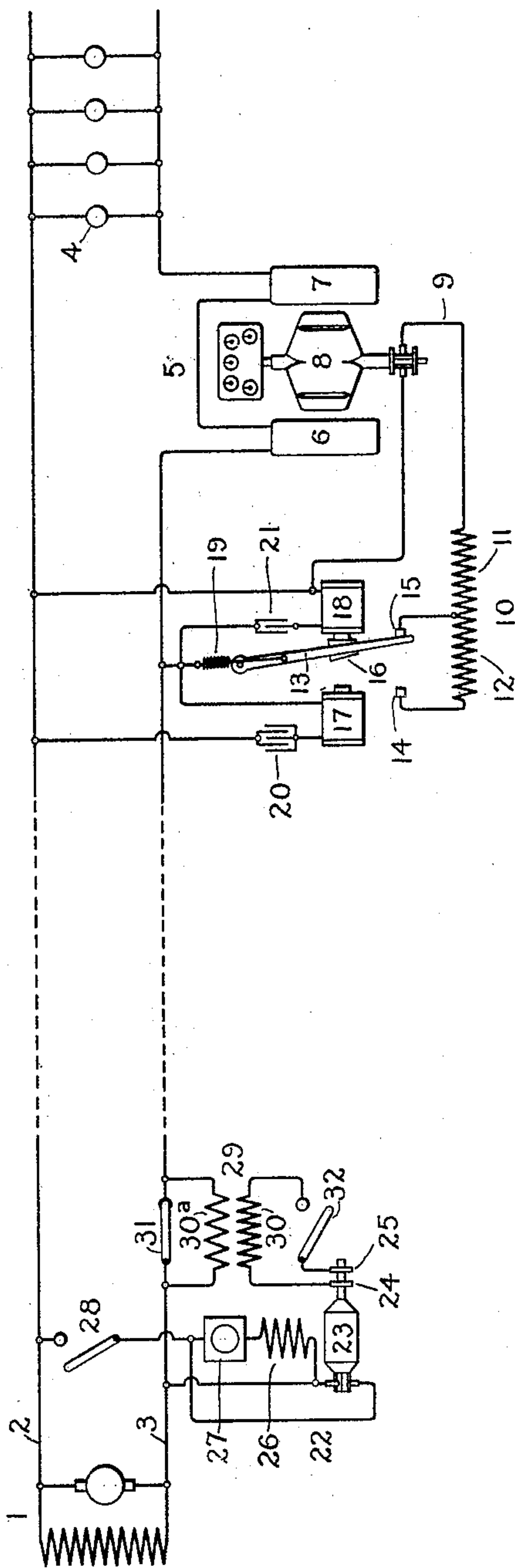
No. 706,575.

Patented Aug. 12, 1902.

A. D. LUNT.
MULTIRATE METERING SYSTEM.

(Application filed Jan. 31, 1901.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

ALEXANDER D. LUNT, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

MULTIRATE-METERING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 706,575, dated August 12, 1902.

Application filed January 31, 1901. Serial No. 45,489. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER D. LUNT, a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Multirate-Metering Systems, (Case No. 1,889,) of which the following is a specification.

My present invention relates to means controllable from a central station or other suitable point for altering at will the rate of registration of energy consumption on a distribution system or portion of a system fed from said station, the operation being effected without the employment of any additional conductors between the meter and the central station and without the utilization of a ground on the system, as has heretofore been proposed. This result I accomplish by the employment of an actuating device located in the vicinity of the meter, this actuating device being arranged so as to respond to alternating currents of suitable selected frequencies sent over the distribution system from the central station. A current of one selected frequency, for example, will serve to move the actuating device in one direction, while a current of some other selected frequency causes an opposite movement. The movements thus produced may be utilized to change the rate of the meter in any usual or ordinary manner—as, for example, by cutting in or out resistance in the armature-circuit of the meter or by shifting the registration from one recording device to another.

The various features of novelty which constitute the invention are pointed out in the appended claims. For a detailed description of the invention and its mode of operation reference is, however, to be had to the following description, taken in connection with the accompanying drawing, which represents a diagrammatic embodiment of one form of my invention.

At 1 is indicated a source of current located at a central station, the source in this case being shown as one capable of supplying direct current. It is to be understood, however, that the invention is also applicable to an alternating-current system. Extending from the source are distributing-conductors

2 3 of indefinite length, as indicated by the dotted lines forming portions of the same. At one portion of the distribution system are indicated translating devices 4 of any ordinary character, these translating devices being merely typical of a suitable load. In proximity to these translating devices is located a meter 5 of any ordinary form—such, for example, as a Thomson recording-watt-meter. The current-coils 6 and 7 are shown as connected in the ordinary manner in series with one of the mains—as, for example, the main 3. The armature is represented at 8 and is connected across the mains 2 and 3. In the armature-circuit, which is indicated at 9, is included a resistance 10, of which a portion 11 is always in circuit, while another portion 12 may be cut in or out of circuit by means of the switch-arm 13, which is connected to the main 3 and coöperates with fixed contacts 14 15, joined, respectively, to the terminals of the section 12 of the armature-resistance. The switch-arm 13, having an armature 16 of magnetic material, may be acted upon by either one of the controlling-magnets 17 18. When urged toward one side or the other of a neutral position, the switch-arm is retained in the position thus assumed by a spring 19, whose line of pull holds the switch-arm in either one of its two extreme positions. The magnets 17 18 are connected, respectively, across the mains 2 3, the circuit of each magnet including therein a condenser or other capacity device, these condensers being indicated at 20 and 21. The condenser 20 and the inductance of the magnet 17 in one of these circuits are so proportioned with respect to each other as to be resonant or approximately resonant to alternating current of a certain selected frequency. In a similar manner a condenser 21 and the inductance of the magnet 18 in the other circuit are so chosen with reference to each other as to cause the circuits including the same to become resonant with alternating current of some selected frequency different from that with which the circuit including the condenser 20 and magnet 17 is resonant. When, therefore, current of one of these selected frequencies is sent over the distributing conductors 2 3, the switch-arm 13 is thrown into

one of its extreme positions—as, for example, toward the left—by reason of which the total resistance 10 is included in the armature-circuit of the meter. When alternating current of the other selected frequency is sent over the line, the switch-arm is moved to its opposite position, thereby cutting out the section 12 of the resistance in the meter armature-circuit, thereby altering the rate of the meter, as will readily be understood. In order to send alternating current of either of these selected frequencies over the distribution system from the central station, I may make use of a variety of devices, one of which is, for example, indicated at 22. This device comprises a motor arranged to operate as an inverted rotary converter, collector-rings for taking off the alternating current from the armature 33 of the converter being shown at 24 and 25. The field-winding 26 of this machine is shown as being in shunt to the armature and including a regulating-resistance 27; but it is evident that any other suitable connection may be employed. The terminals of the machine may be connected across the mains 2 3 at will by means of a switch 28. The alternating-current terminals of this inverted rotary, as indicated by the collector-rings 24 and 25, are arranged to impress an alternating electromotive force upon the distribution system 2 3 through the instrumentality of a transformer 29, the primary winding 30 of which may be connected across the alternating-current terminals, while the secondary winding 30^a may in its turn be connected in series with the main 3 by the opening of a short-circuiting switch 31.

When it is desired to change the rate of a meter 5 upon the distributing system, the inverted rotary is started up by closing the switch 28 and is brought up to a suitable speed by the manipulation of the field rheostat 27. The short-circuiting switch 31 is then opened and the primary switch 32 is closed, thereby conveying a superposed alternating current of suitable frequency over the distribution system and so actuating the switch-changing device of the meter, the rate of registration of which is thereby changed. By changing the speed of the inverted rotary so as to correspond with the other selected frequency the rate-changing apparatus of the meter may be operated in the opposite direction, as will readily be understood.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of means for metering electric current of a given character, with means controlled by current of a different

character for changing the rate of registration or metering.

2. The combination of a direct-current meter, and means controlled by an alternating electromotive force for changing the rate of the meter.

3. The combination of a circuit-changing switch, a magnet responsive to current of a given frequency for urging the switch in one direction, another magnet responsive to current of a different frequency for actuating the switch in the opposite direction, and a means operative at will for supplying said magnets with alternating current of either frequency.

4. The combination of an electric meter for measuring current of a given character, and means controlled by current of a different character for changing the rate of registration of the meter.

5. The combination of a direct-current-distribution system, a switch-actuating circuit connected thereto, and means for impressing an alternating electromotive force on said system.

6. The combination of a direct-current-distribution system, a meter connected thereto, and a switch responsive to alternating electromotive force for altering the resistance of the armature-circuit of said meter.

7. The combination of a distribution system, a meter connected thereto, a switch movable in opposite directions by alternating electromotive forces of respectively different frequencies, and means controlled by said switch for altering the rate of registration of said meter.

8. The combination of an electric meter, a device sensitive to alternating currents of different frequencies for changing the rate of the meter, and means for supplying alternating currents of selected frequencies to said device.

9. The combination of a direct-current-distribution system, means for impressing alternating currents of selected frequencies upon said system, and a circuit-changing switch responsive to said alternating current.

10. The combination of a distribution system, means for impressing alternating currents of selected frequency upon said system, and a circuit-changing switch responsive to said alternating current.

In witness whereof I have hereunto set my hand this 30th day of January, 1901.

ALEXANDER D. LUNT.

Witnesses:

BENJAMIN B. HULL,
FRED RUSS.