

No. 611,927.

Patented Oct. 4, 1898.

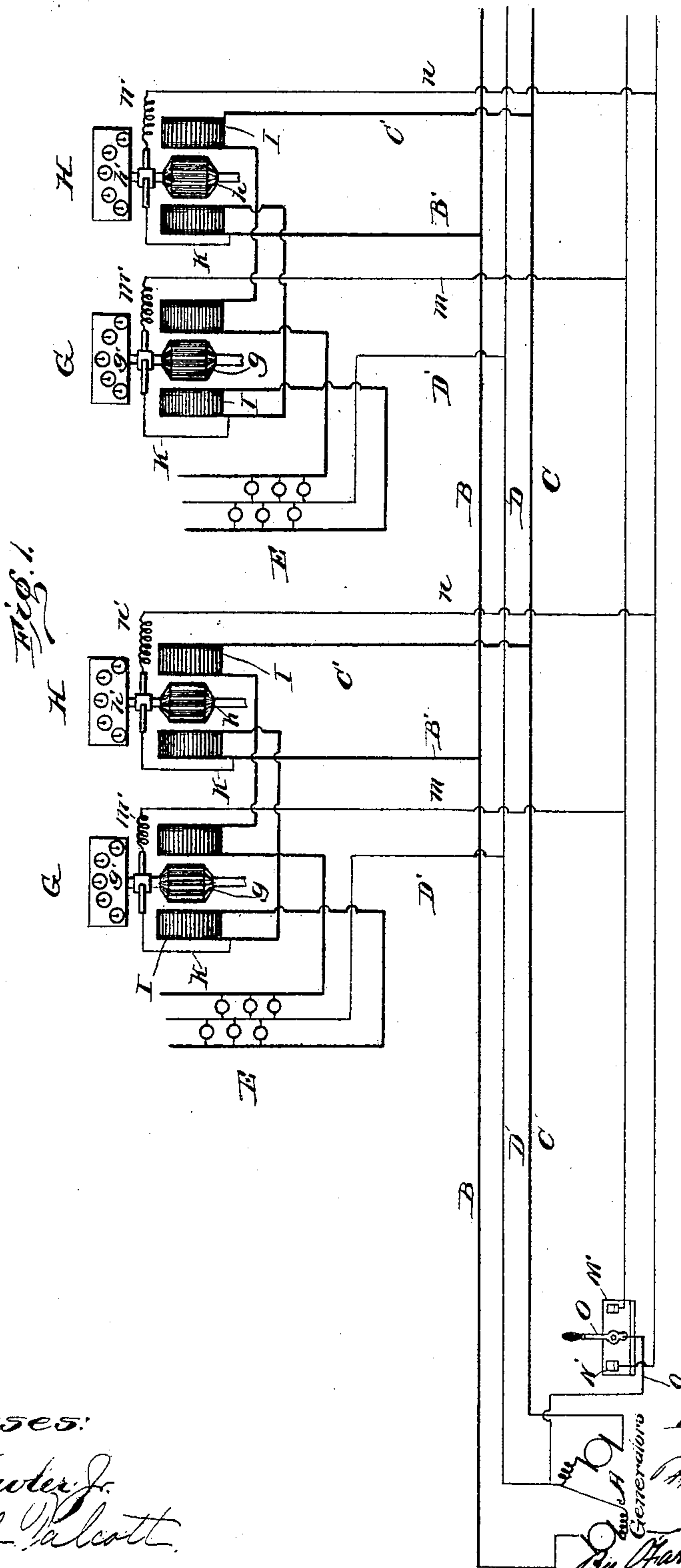
F. T. McINTYRE.

MULTIPLE RATE METERING SYSTEM.

(Application filed Mar. 25, 1898.)

(No Model.)

2 Sheets—Sheet 1.



witnesses:

J. M. Fowler Jr.
Russell Walcott.

Inventor:

Fred S. McIntyre

By ^{and for} Hannell Fowler & Hannell
Attorneys.

No. 611,927.

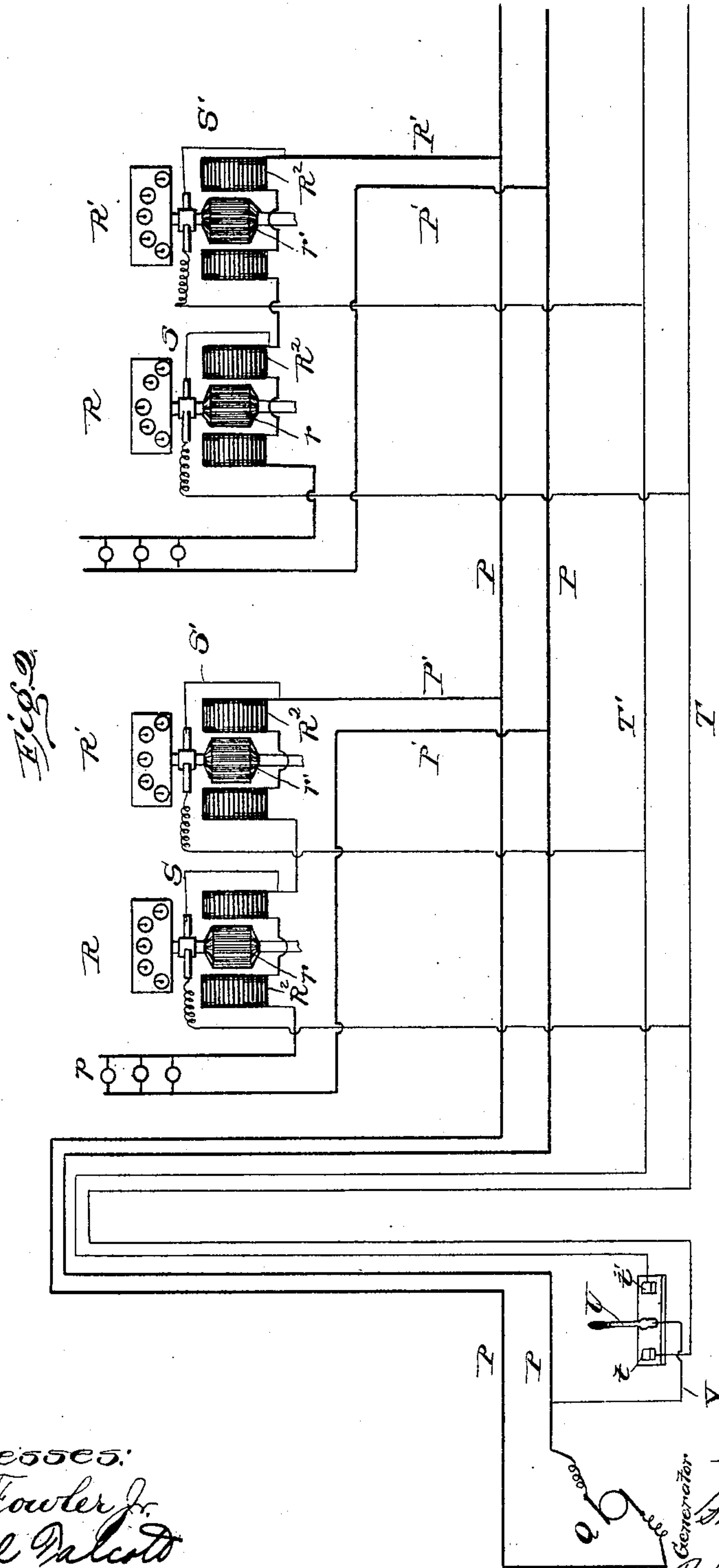
Patented Oct. 4, 1898.

F. T. MCINTYRE.
MULTIPLE RATE METERING SYSTEM.

(Application filed Mar. 25, 1898.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:

J. M. Fowler Jr.
Russell McIntyre

Inventor:

Fred T. McIntyre
By Russell Fowler & Russell
Attorneys.

UNITED STATES PATENT OFFICE.

FREDERICK T. MCINTYRE, OF WASHINGTON, DISTRICT OF COLUMBIA.

MULTIPLE-RATE METERING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 611,927, dated October 4, 1898.

Application filed March 25, 1898. Serial No. 675,147. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK T. MCINTYRE, a citizen of the United States of America, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Multiple-Rate Metering Systems, of which the following is a specification.

This invention relates to improvements in electrical lighting or power-distributing systems wherein it is desired to charge the consumers a differential rate for the current supplied at different times during the twenty-four hours.

The invention has for its object the improvement of that class of multiple-rate metering systems employing two independent meters at each consumer's station, one for registering during low-rate hours and the other during high-rate hours and without regard to the particular character of meter employed or the particular system of distribution employed—that is to say, whether a two or three wire system.

The invention may be said to consist generally in providing two control circuit-wires extending throughout the distributing systems, connecting all the low-rate meters in independent branches between one of said control-wires and the distributing system and all the high-rate meters in independent branches between the other one of said control-wires and the distributing system, and in providing a switch at the central or distributing station for connecting either one or the other of said control-wires in circuit, and thereby throwing either one or the other set of meters into operative relation to the distributing system.

The invention further consists in certain novel details of construction and combinations and arrangements of parts, all as will be now described, and pointed out particularly in the appended claims.

Referring to the accompanying drawings, Figure 1 is a diagrammatic illustration of a system embodying my present invention in its preferred arrangement in connection with a three-wire system of distribution. Fig. 2 is a similar view showing a two-wire system of distribution.

In Fig. 1, which illustrates the three-wire

system, the letter A indicates the two generators, B and C the positive and negative wires or mains, and D the neutral wire or main. Service branches or auxiliary mains B', C', and D' are taken from the mains B, C, and D at each consumer's station, and the translating devices E (shown as lamps, although they may be motors, heaters, or other devices) are connected between them, as usual.

The two service-meters G and H (shown as high-efficiency meters) for each consumer's station have their fields I in circuit with the translating devices, preferably one of the fields of each meter in series in each of the auxiliary positive and negative mains, as shown.

The armatures *g h* of the meters G H are geared to independent registering devices *g' h'*, and branches K connect one terminal of each armature with the main passing through its field. The opposite terminal of each meter-armature has heretofore been connected through suitable switching mechanism to cut the meter in or out with the neutral wire at the consumer's station; but I now provide two independent control-wires M N, extending throughout the distributing system, and connect the said opposite terminal of each of the low-rate meters by a branch *m* with one of said control-wires and the corresponding terminal of each of the high-rate meters by a branch *n* with the other of said control-wires. Resistances *m' n'* are preferably interposed in each branch *m n* for obvious reasons, and in this connection it will be noted that the control-wires may be of small section, owing to the fact that they only need carry a light current.

Control-wires M N terminate in contacts M' N' at the power or control station, and a switch O is provided for connecting either one or the other of them in circuit with the neutral main of the distributing system, as by a wire *o*, which extends from the switch to the neutral main D.

Switch O is preferably made as a single-arm switch, whereby when one control-wire is in circuit the other must be out, and it will be now seen that when the switch is thrown one way all the low-rate meters will be connected up ready for operation, and when the switch is thrown the opposite way all the high-rate

meters will be connected ready for operation and the low-rate meters will be cut out and cannot be operated.

All expensive and unreliable individual switching mechanism is avoided by this system, and the meters are thrown into or out of operative relation to the system directly by the manipulation of the switch at central, which switch controls the current which directly actuates the meters. This control-wire system may be tested by the simple expedient of connecting a meter in either of its wires at the central station, whereas if said control-wires simply operated magnetically - controlled switches at each consumer's station no efficient test could be made, owing to the fact that one switch might operate while another in the same circuit might stick and not operate, requiring a personal inspection of each meter every time a change is made from one to the other.

Obviously the invention is applicable to a two-wire system of distribution, and I have illustrated such an application of it in Fig. 2. In this instance the mains P P proceed from the generator Q, and the auxiliary mains or consumers' branches P' P' connect therewith and include translating devices *p*. The two independent meters R R' preferably have their fields R² connected in series in one of the auxiliary mains, and their armatures *r r'* are included in independent branches S S' between the auxiliary main and the independent control-wires T T', extending back to central and terminating in contacts *t t'*, with which a switch U is adapted to coöperate to complete the circuit through one or the other of the meters and throw the latter into operative relation with the distributing system. The switch U should be connected, as by a wire V, with the opposite main from that with which the armature of the meter is connected in order to establish the most efficient operative relation.

The particular manner of coupling up the meters, it is obvious, is immaterial and may be varied to suit the particular meter employed, it only being necessary that one of its elements which will control its operation be in circuit through the control-wire, and hence I do not wish to be limited in this respect or in respect to the particular system of distribution employed.

Having thus described my invention, what

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

1. In a multiple metering system of electrical distribution, the combination with two independent meters having their register-controlling elements connected in independent branches, of the distributing-mains, of independent control-wires connecting said branches with the distant central or control station, and a switch mechanism for completing the circuit through one or the other of said control-wires and meter in circuit therewith; substantially as described.

2. In a multiple metering system, of electrical distribution, the combination with a source of supply, distributing-mains extending therefrom and including translating devices and independent meters included in branches from the mains for registering the current consumed by the translating devices, of independent control-wires independent of the working circuit extending from a point near the source of supply and connected one with each meter branch and a switch for connecting one or the other of said control-wires with one of the distributing-mains for completing the circuit through one or the other of the control-wires, and the meter in circuit therewith; substantially as described.

3. In a multiple metering system of electrical distribution, the combination with a source of supply, distributing-mains extending therefrom, a series of supplemental mains connected in multiple therewith and, including translating devices and two independent meters one for registering high and the other low rates, connected in each of the supplemental mains with their register-controlling elements in branches of said supplemental mains, of two independent control-wires, one of which is connected with all the branches for the high-rate meters and the other of which is connected with all the branches for the low-rate meters, and a switch at a central control-station for establishing a shunt from all the supplemental mains through all the high-rate meters, and their control-wire, or through all the low-rate meters and their control-wire; substantially as described.

FRED. T. MCINTYRE.

Witnesses:

RUSSELL TALCOTT,
PATRICK H. O'FARRELL.