No. 759,904. PATENTED MAY 17, 1904.

E. F. MOY & P. H. BASTIE.

REGULATING APPARATUS FOR THEATRICAL ELECTRIC LIGHTING.

APPLICATION FILED DEC. 11, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

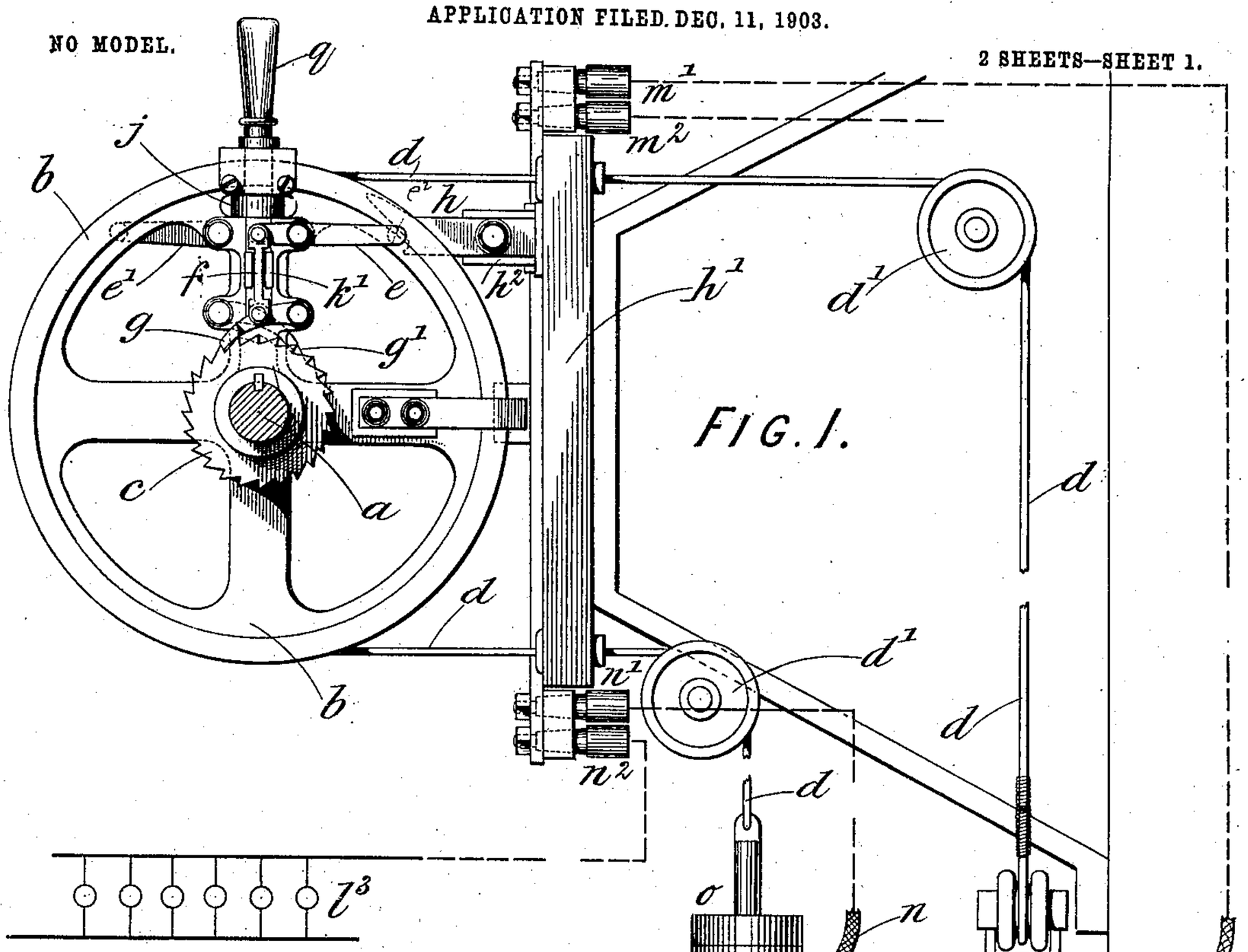


FIG. 1.

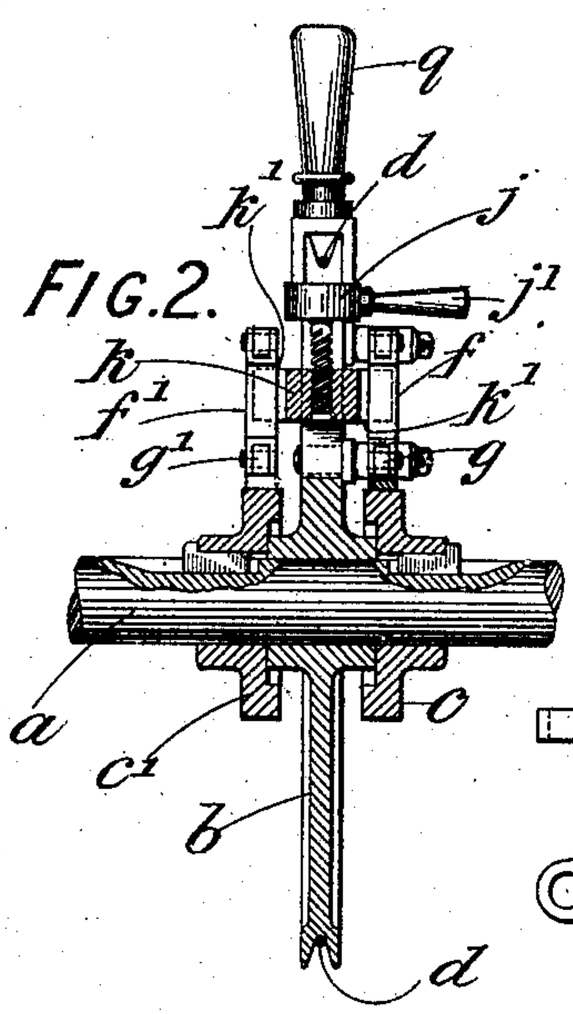


FIG. 2.

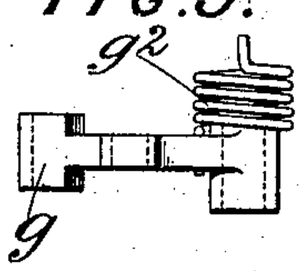
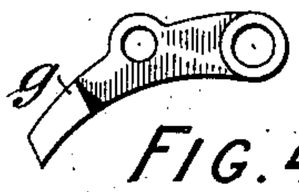


FIG. 3.



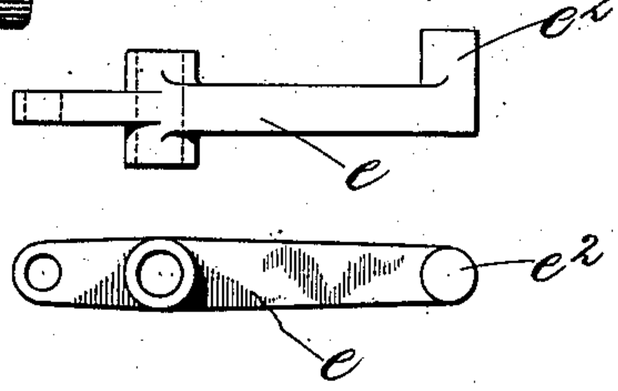
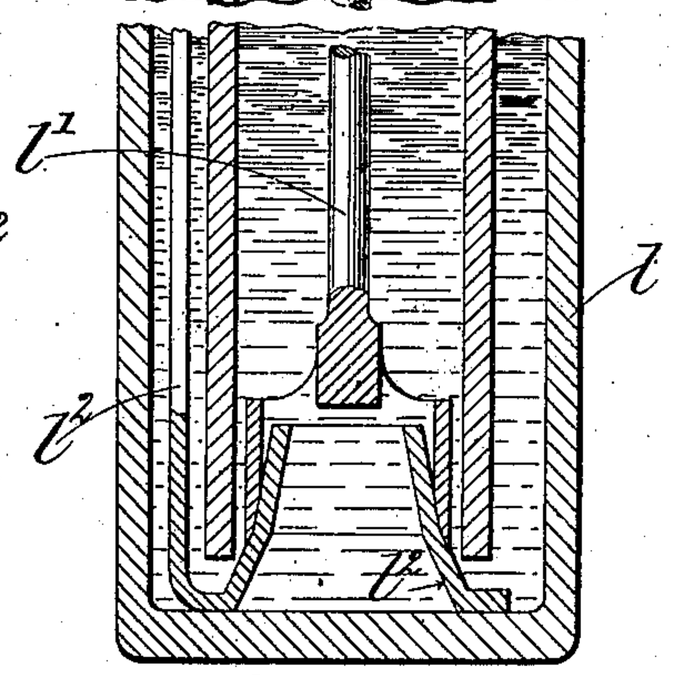


FIG. 4.



WITNESSES.

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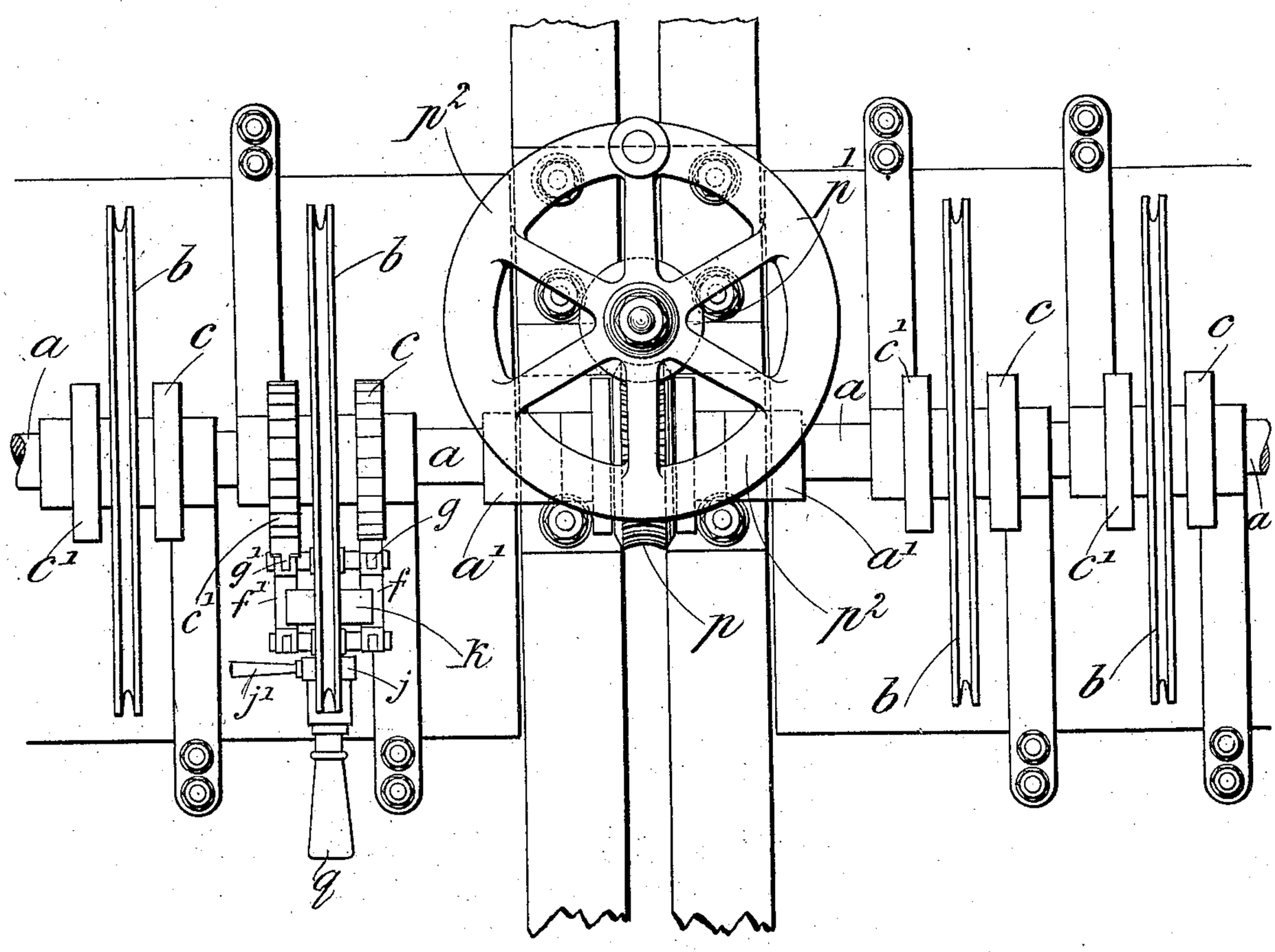
FIG. 5.



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UNITED STATES PATENT OFFICE.

ERNEST FRANCIS MOY AND PERCY HENRY BASTIE, OF ST. PANCRAS, LONDON, ENGLAND.

REGULATING APPARATUS FOR THEATRICAL ELECTRIC LIGHTING.

SPECIFICATION forming part of Letters Patent No. 759,904, dated May 17, 1904.

Application filed December 11, 1903. Serial No. 184,827. (No model.)

To all whom it may concern:

Be it known that we, ERNEST FRANCIS MOY and PERCY HENRY BASTIE, subjects of the King of the British Dominions, and residents of St. Pancras, in the county of London, England, (whose post-office address is 3 Greenland Place, Camden Town, London, England,) have invented certain new and useful Improvements in Regulating Apparatus for Theatrical Electric Lighting, of which the following is a specification.

Our invention relates to regulating and controlling apparatus for varying the supply of current, and therefore of the light, given in one or more of the electric-light circuits used in theaters or for entertainments in other public places. The regulating apparatus is usually fixed at some point on or near the stage and is adapted to operate various forms of adjustable resistances, choking-coils, or equivalent devices known as "dimmers" placed in the lamp-circuits, whereby the light given is diminished or increased as required. The dimmers are usually placed at some distance from the stage or position of the operator, and our improved regulating apparatus enables the operator to control separately or collectively any required number of dimmers, each affecting a group of lamps, by flexible tracker-wires leading from the apparatus to the several dimmers.

In the further description of the invention reference is made to the accompanying drawings, in which—

Figure 1 is an end elevation of a vertical panel or framework with a regulating-wheel mounted on a shaft and adapted to operate a liquid-resistance dimmer, drawn in section, by means of a counterweight and tracker-wires led over guide-pulleys, the lamp-circuit being indicated diagrammatically. Fig. 2 is a vertical section of the regulating-wheel shown in Fig. 1. Fig. 3 comprises a plan and elevation, respectively, of a ratchet-pawl employed, drawn to an enlarged scale. Fig. 4 is a similar plan and elevation of a rocking lever; and Fig. 5 is a plan of a group of such regulating-wheels, some of the details being omitted, showing the means whereby they may be collectively operated.

On the main shaft a a wheel b (one of the required number) is mounted to turn freely on the shaft. Two ratchet-wheels c and c', with their teeth in opposite directions, are keyed to the shaft, one on each side of each wheel b, so as to act as retaining-collars thereto. The wheel is grooved on its periphery to receive a thin wire rope or flexible wire d, called a "tracker-wire," to transmit the motion of the wheel b to the dimmer which it is to control. Near the rim of each wheel and on each side thereof rocking levers e and e' are pivoted to its web or to an extended arm and linked by short connecting-rods f and f' to two oppositely-arranged pawls g and g', which act upon the corresponding ratchet-wheels c and c'. Each pawl is kept pressed to its seat by a coiled spring g^2, Fig. 3, and h is a fork-ended stop fixed to a base, vertical panel, or framework h', adapted to engage with the end e^2, Fig. 4, of one of the rocking levers e when the same is carried round in that direction by the revolution of the wheel b. The continued movement of b toward the stop h depresses the outward end of the rocking lever e, presented to the stop, thus raising pawl g out of gear with its ratchet-wheel without overturning the wheel b. A similar stop (not shown) is fixed on the lower part of the panel or framework h', arranged and similarly adapted to trip the other pawl g' on the opposite side of the wheel in the same manner when the wheel b has made about half a revolution more and brought it in contact with the said stop. The stops are adjustable in slides h^2 to release the pawls at the exact point required to control the dimmers. A quick-pitch screw j, having a small handle, engages with a nut k, sliding in slot formed in one of the arms of the wheel, and by projections k' on opposite faces of the nut k the operator is enabled to raise the connecting-rods and pawls altogether, thus freeing both ratchet-wheels and allowing the shaft a or the wheels b each to be moved independently of the other, which remains stationary.

The dimmer l, shown in the section Fig. 1,

is of the kind known as a "liquid" resistance, and the tracker-wire d is passed over one or more guide-rollers d' and secured to a central rod of the electrode l', so as to lift it and lower it as the wheel b is turned. A flexible electric conductor m is electrically connected with the rod and to a suitable terminal m' on the panel or framework h', and a similar conductor n is led from the other electrode l^2 to the terminal n', and other terminals m^2 and n^2 form connections with the main electric supply and the lamp-circuit l^3, all in the known manner. A counterweight o, secured to the wire d, is used to balance the parts and facilitate the operation of the regulating apparatus, so that as the wheel b is turned in one direction the electrode l' is raised within the electrolyte, thus increasing the resistance in the circuit and decreasing the light in the lamp-circuit as gradually as the wheel b is turned, while if the wheel is turned in the other direction the light is correspondingly increased.

The shaft a, arranged to carry as many wheels b as there are lamp-circuits to be controlled, is caused to revolve in its bearings a' by a worm-wheel p and worm p', having a hand-wheel p^2 to revolve the same. On turning the hand-wheel to revolve the shaft, the ratchet-wheels c and c' being keyed to the shaft with a wheel b between each pair, those wheels only are turned in the same direction as the shaft whose pawl engages with the teeth of the corresponding ratchet-wheel, any others remaining stationary. If the shaft a is revolved by the hand-wheel p^2 in the opposite direction, the wheels b that were first moved now become stationary, while the former stationary wheels are now made to revolve with the shaft, and as it is preferred to proportion the diameter of each wheel b so that one half-revolution thereof produces the full traverse of the adjustable resistance the full dimming or illuminating effect is obtained in those lamp-circuits under regulation by a corresponding number of turns of the hand-wheel in the required direction.

As explained above, the continued revolution of any wheel b in either direction brings one of the rocking levers e or e' in contact with one of two fixed stops h, which is practically in the form of an inclined plane as presented to the movement of the projecting end e^2 of the lever, thus imparting a lifting movement to its pawl g or g' through the intervening short connecting-rod f or f' and automatically disconnecting the wheels from the shaft a. As only one pawl is tripped by each stop, motion will be communicated to the wheel by the oppositely-placed pawl on the other side of the same wheel if the motion of the shaft is reversed, which if continued until the other stop lifts the opposite rocking lever produces the similar action of automatically releasing the wheel from the shaft, although the latter may continue its revolution. This action may apply to one or to any required number of wheels, thus controlling one or more lamp-circuits by the movement of the hand-wheel and shaft; but to regulate any circuit independently, or to prevent it being affected by the regulation of any of the other circuits the operator turns the quick-pitch screw j by the handle j'' to lift both pawls g and g' simultaneously clear of the two ratchet-wheels c and c'. This allows the wheel b and the adjustable resistance to be placed by the handle q in any desired position in regulating a particular circuit without affecting any other circuit, and also allows one or more wheels to be left in the desired position, while the remainder are operated by the shaft a, as previously described.

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

1. A regulating apparatus for varying the current-supply in stage-lighting-lamp circuits, having in combination a shaft with means to revolve the same, wheels loosely mounted on said shaft, a ratchet-wheel secured to the shaft on each side of and contiguous to each wheel, and means adapted to connect said wheel and shaft together when the shaft is revolved in either direction, means adapted to entirely disconnect the said wheel at the will of the operator, and means for varying adjustable resistances placed in said circuits, substantially as and for the purpose set forth and shown in the drawings.

2. In a regulating apparatus for varying the current-supply in stage-lighting-lamp circuits, the combination of a shaft, a ratchet-wheel secured to the shaft, a hand-wheel loosely mounted on said shaft, a mechanism consisting of a linkwork carrying a pawl mounted on and turning with said hand-wheel, and means such as a pivoted lever or screw acting upon said linkwork to put said pawl into or out of contact with said ratchet-wheel, substantially as and for the purpose set forth and shown in the drawings.

3. In a regulating apparatus for varying the current-supply in stage-lighting-lamp circuits, the combination of a shaft, two ratchet-wheels secured to the shaft, a hand-wheel loosely mounted on said shaft contiguous to said ratchet-wheels, a mechanism consisting of a linkwork carrying two pawls mounted on and turning with said hand-wheel, and means such as a lever or levers acting upon said linkwork to put said pawls into or out of contact with said ratchet-wheels, substantially as and for the purpose set forth and shown in the drawings.

4. In a regulating apparatus for varying the current-supply in stage-lighting-lamp circuits, the combination of a revoluble shaft, two ratchet-wheels secured to the shaft, a hand-wheel loosely mounted on said shaft contiguous to said ratchet-wheels, a mechanism con-

sisting of a linkwork carrying two pawls mounted on and turning with said hand-wheel, means such as a lever or levers and a stop or stops for automatically putting said pawls into or out of contact with said ratchet-wheels, substantially as and for the purpose set forth and shown in the drawings.

5. In a regulating apparatus for varying the current-supply in stage-lighting-lamp circuits, the combination of a revoluble shaft, two ratchet-wheels secured to the shaft, a hand-wheel loosely mounted on said shaft contiguous to said ratchet-wheels, a mechanism consisting of a linkwork carrying two pawls mounted on and turning with said hand-wheel, means such as levers and stops for automatically and alternatively, putting said pawls into or out of contact with said ratchet-wheels to connect or disconnect said hand-wheel and shaft when the wheel is revolved in either direction to a predetermined point, substantially as and for the purpose set forth and shown in the drawings.

6. In a regulating apparatus for varying the current-supply in stage-lighting-lamp circuits, the combination of a revoluble shaft, two ratchet-wheels secured to the shaft, hand-wheel loosely mounted on said shaft contiguous to said ratchet-wheels, a linkwork carrying two pawls mounted on and turning with said hand-wheel, means such as levers and stops for automatically and alternatively putting said pawls into or out of contact with said ratchet-wheels to connect or disconnect said hand-wheel and shaft, an adjustable resistance for varying the current in a lamp-circuit, and means such as a wire for transmitting motion between said hand-wheel and said resistance, substantially as and for the purpose set forth and shown in the drawings.

7. In a regulating apparatus for varying the current-supply in stage-lighting circuits, the combination of a shaft having two ratchet-wheels secured thereon, a revoluble wheel loosely mounted on said shaft between said ratchet-wheels, a hand-operated screw lifting or lowering mechanism having two pawls arranged to engage with said ratchet-wheels in opposite directions mounted upon said revoluble wheel, adapted and operating to disconnect or connect said pawls from or with said ratchet-wheels, substantially as and for the purpose set forth and shown in the drawings.

8. In a regulating apparatus for varying the current-supply in stage-lighting-lamp circuits, the combination of a shaft, a wheel loosely mounted thereon, a ratchet-wheel fixed to the shaft on each side of and close to the wheel, a lifting device mounted on the wheel carrying two pawls adapted to engage alternately with each ratchet-wheel when turned in opposite directions, and two fixed stops each adapted to automatically disengage the driving-pawl at the predetermined limit of motion of the wheel in either direction, substantially as and for the purpose set forth and shown in the drawings.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

ERNEST FRANCIS MOY.
PERCY HENRY BASTIE.

Witnesses:
J. WETTER,
WALTER E. ROCHE.