

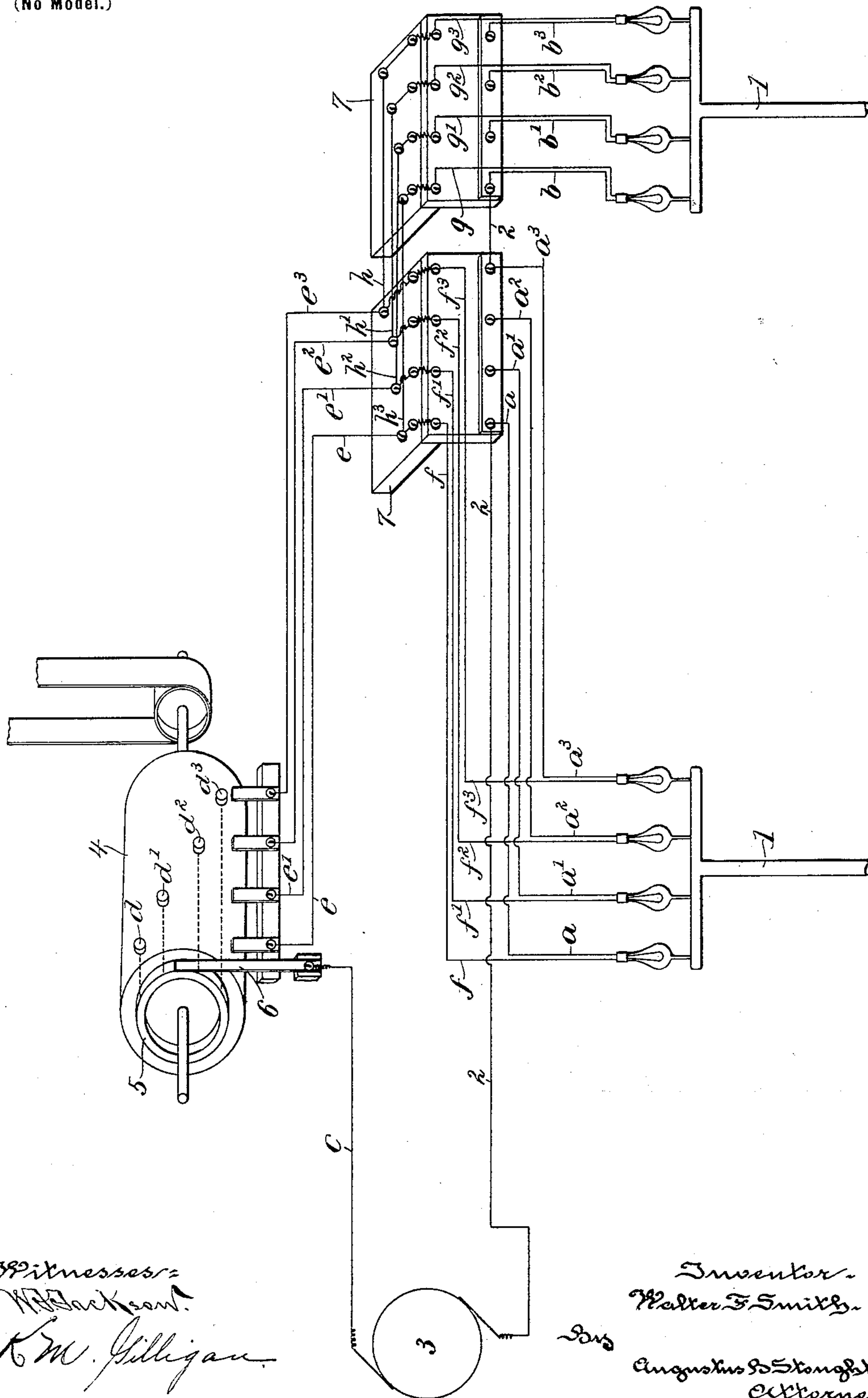
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Patented Aug. 15, 1899.

W. F. SMITH.
APPARATUS FOR EXHAUSTING ELECTRIC LAMPS.

(Application filed Mar. 1, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR EXHAUSTING ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 630,997, dated August 15, 1899.

Application filed March 1, 1899. Serial No. 707,337. (No model.)

To all whom it may concern:

Be it known that I, WALTER F. SMITH, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Exhausting Electric Lamps, of which the following is a specification.

The object of the invention is to provide means for exhausting lamps which shall facilitate the operation and insure excellent results.

The invention comprises the improvements hereinafter described and claimed.

The nature, characteristic features, and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawing, forming part hereof and in which is illustrated diagrammatically means embodying features of the invention.

In the drawing groups of lamp-bulbs are connected with an exhaust connection 1, which in turn communicates with a suitable vacuum-pump. Prior to my invention it has been customary to connect groups of lamp-bulbs in this manner and to simultaneously pass currents through all of their filaments while exhausting their bulbs. This is done in order to expel by heat occluded gases from the filaments and to remove such gases from the bulbs by the exhaust or mercury pump. When this was done, the degree of heat to which the filaments were subjected was necessarily limited, because otherwise the occluded gases would be driven off in volume greater than the vacuum-pump could take care of. It was therefore customary to continue to heat the filaments to a comparatively low degree of temperature for a considerable length of time in order to expel occluded gases from them as slowly as the vacuum-pump could take care of them. This entailed the consumption of considerable time and current and was not productive of the best results. In my invention one side of each lamp of each group is connected, as by conductors $a\ a'\ a^2\ a^3\ b\ b'\ b^2\ b^3$, with a common return 2, that leads to one terminal of the source of current 3. The other side of each lamp of each

group is connected for a comparatively short interval of time to the other terminal of the source of current, so that each lamp of a group is heated in succession by the passage through its filament of the current. During this operation the exhaust or mercury pump is in operation, and since the lamps of the groups are lighted or heated successively their temperature may be comparatively high, the occluded gases may be rapidly expelled, and the exhaust apparatus can remove the gases so expelled, because the filaments are heated singly and successively. To this end I make use of a switch 4, provided with a conducting ring or collar 5, upon which bears a brush 6, that is connected by way of the conductor c with the source of current 3. Upon the cylindrical surface of the switch 4 and insulated from it are contacts $d\ d'\ d^2\ d^3$ equal in number to the number of lamps in each group and arranged as shown. Each of these contacts is in electrical connection with the conducting-collar 5 by way of a conductor. (Shown in dotted lines.) There are brushes arranged to touch the contacts d , &c., as the switch 4 is shifted or rotated, and these brushes are respectively provided with conductors $e\ e'\ e^2\ e^3$, that communicate with one side of each lamp of the number. As shown, these conductors are led to a block 7 and are there connected to terminals. The lamps a , &c., are connected with these terminals through suitable fuses and by way of conductors f, f', f^2 , and f^3 . As the switch 4 is shifted the circuit is completed by way of the conductor c , brush 6, collar 5, and contacts d , &c., successively and singly by way of the conductors e , &c., and f , &c., with the lamps, so that the filaments of the latter are included in circuit successively and one at a time, it being remembered that the other side of each lamp is always in connection by way of the conductors a , &c., and the common return 2 with the source of energy. If additional groups of lamps are employed, one side of each of them may be connected through a second block like the block 7 and illustrated at the right-hand side of the sheet. In such case conductors, as $g\ g'\ g^2\ g^3$, are employed for connecting one side of the filament of each lamp

through fuses to and by way of conductors h , h' , h^2 , h^3 with the conductors e , e' , e^2 , and e^3 .

It will be obvious to those skilled in the art to which my invention appertains that modifications may be made in details without departing from the spirit thereof. Hence I do not limit myself to the precise construction and arrangement of parts hereinabove set forth and illustrated in the accompanying drawing; but,

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

Means for exhausting lamp-bulbs which comprise an exhaust connection communicating with a group of lamps, a source of current, and a switch and its circuit connections for successively cutting each lamp of the group into and out of circuit, substantially as described.

In testimony whereof I have hereunto signed my name.

WALTER F. SMITH.

In presence of—

K. M. GILLIGAN,
W. J. JACKSON.