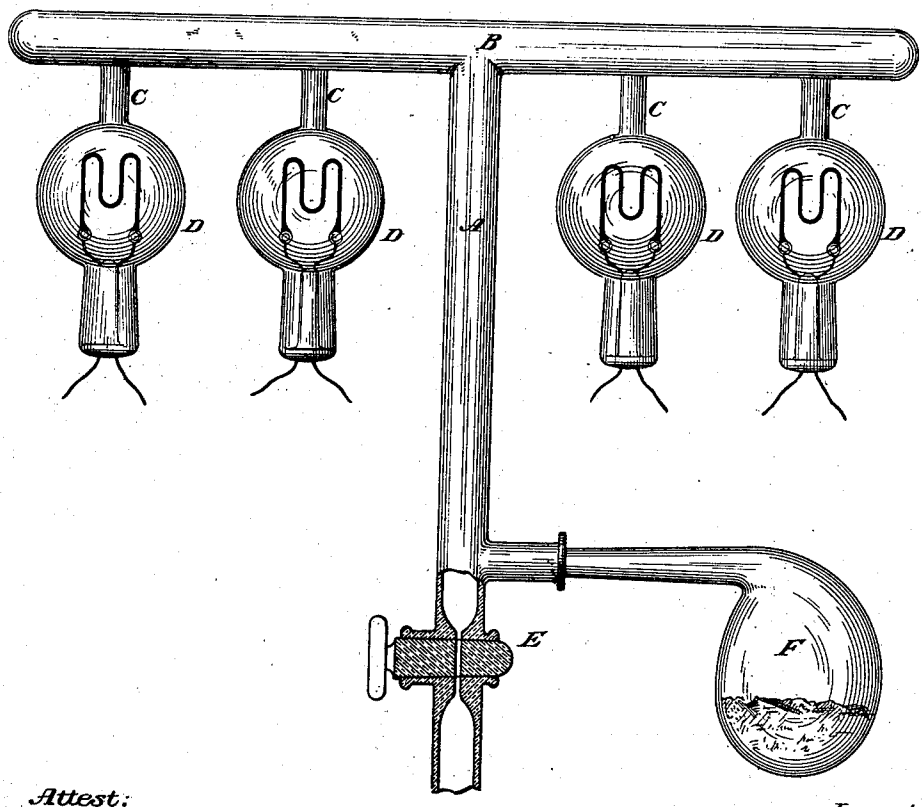
(No Model.)

E. WESTON.

ABSORBENT FOR ELECTRIC LAMPS.

No. 255,362. Patented Mar. 21, 1882.



Attest:

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UNITED STATES PATENT OFFICE.

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ABSORBENT FOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 255,362, dated March 21, 1882.

Application filed October 17, 1881. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WESTON, a subject of the Queen of Great Britain, and resident at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in the Manufacture of Electric Lamps, of which the following is a specification.

The lamps to the manufacture of which this my present invention relates are those in which a conductor of carbon or similar substance is used, the said conductor being mounted on metallic wires sealed into a transparent receiver from which the air has been as far as possible exhausted.

The object of the said invention is to facilitate the withdrawal of air from the globes, and to produce therein a higher vacuum than has heretofore been attained, and this I effect by the employment, under certain conditions hereinafter specified, of the oxide of thorium. In another application I have set forth a plan for utilizing such a substance, consisting substantially in placing in each lamp a small quantity of the oxide of thorium, which under proper manipulation absorbs with great avidity the residual air of an imperfect vacuum. In this way a high vacuum is maintained in the globes. This object I have found may be attained in another and more economical manner by connecting a bulb or retort containing a proper quantity of this substance with the air-exhaust apparatus, heating it, and then allowing it to cool after the process of withdrawing the air has been carried to the usual point, and the portion of the apparatus to which the lamp and the retort are connected cut off from the pump. In this way a number of lamps may be simultaneously exhausted, and then detached in the usual manner and sealed. In this process and in the apparatus employed in the conduct thereof lie my present improvements. The substance thoria or thorina, which I utilize for this purpose, is the only known oxide of thorium—one of the earth metals.

The preparation of thorina from minerals containing thorium may be effected in various ways, according to the nature of the substances with which it is associated. From thorite it may be separated by treating the finely-pulverized ore with hydrochloric acid, evaporating to dryness, digesting the residue with weak acid in order to separate the silica, filtering, and treating the solution with sulphydric acid to separate lead and tin. The resulting solution contains the thorium, which may be precipitated as a hydrate by ammonia, and the precipitate ignited. The resulting product is oxide of thorium, which may be used in the manner directed. Should much iron, manganese, or uranium be present, these bodies may be separated by redissolving the hydrate in weak hydrochloric acid, and the thorium precipitated as potassio-thorinic sulphate by treatment with a hot saturated solution of neutral potassic sulphate. The precipitate thus obtained is dissolved in hot water and treated with ammonia, and the resulting precipitate ignited, as before. Thoria, when used as above described, is a powerful absorbent of the residual gas in an imperfect vacuum, and as such forms a valuable element in the manufacture of durable incandescent lamps.

The drawing hereto annexed illustrates a simple device for simultaneously exhausting a number of lamps according to the method proposed. The apparatus, composed entirely of glass, consists of a main stem, A, with branches extending therefrom, and represented by B. The stem A is arranged for attachment to a suitable exhaust apparatus, and contains a stop-cock, E, by means of which communication with the pump is cut off. At a convenient point along the stem is connected, permanently or detachably, a retort, F, containing a proper quantity of thorina. One or any desired number of lamps, D D, are welded to the branches B by sealing-tubes C C. To exhaust the lamps the plug E is turned to establish communication with the air-pump. The air is then withdrawn as perfectly as possible, the thorina in the retort F being at the same time heated by means of a spirit-lamp. The stem A is then cut off by the stop-cock from the pump, and the thorina allowed to cool, after which the lamps are detached by heating the stems C and twisting them off. This apparatus is typical of others, which may be employed

for the same purpose, so that I would not be understood as confining myself to its use in carrying out my process.

I am aware that substances such as charcoal have been employed for the purpose of absorbing the gases driven off from the carbon conductors in the manufacture of lamps. This I do not claim herein.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The improvement in the manufacture of incandescent electric lamps which consists in first exhausting mechanically the globes as perfectly as possible, and then withdrawing the residual air by means of thorina.

2. The combination, with an air-pump, of an exhaust-tube connected with one or more incandescent electric lamp-globes, and a retort or suitable receptacle containing thorina and connected with the exhaust-tube, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 14th day of October, 1881.

EDWARD WESTON.

Witnesses:

W. FRISBY,

R. F. BARNES.