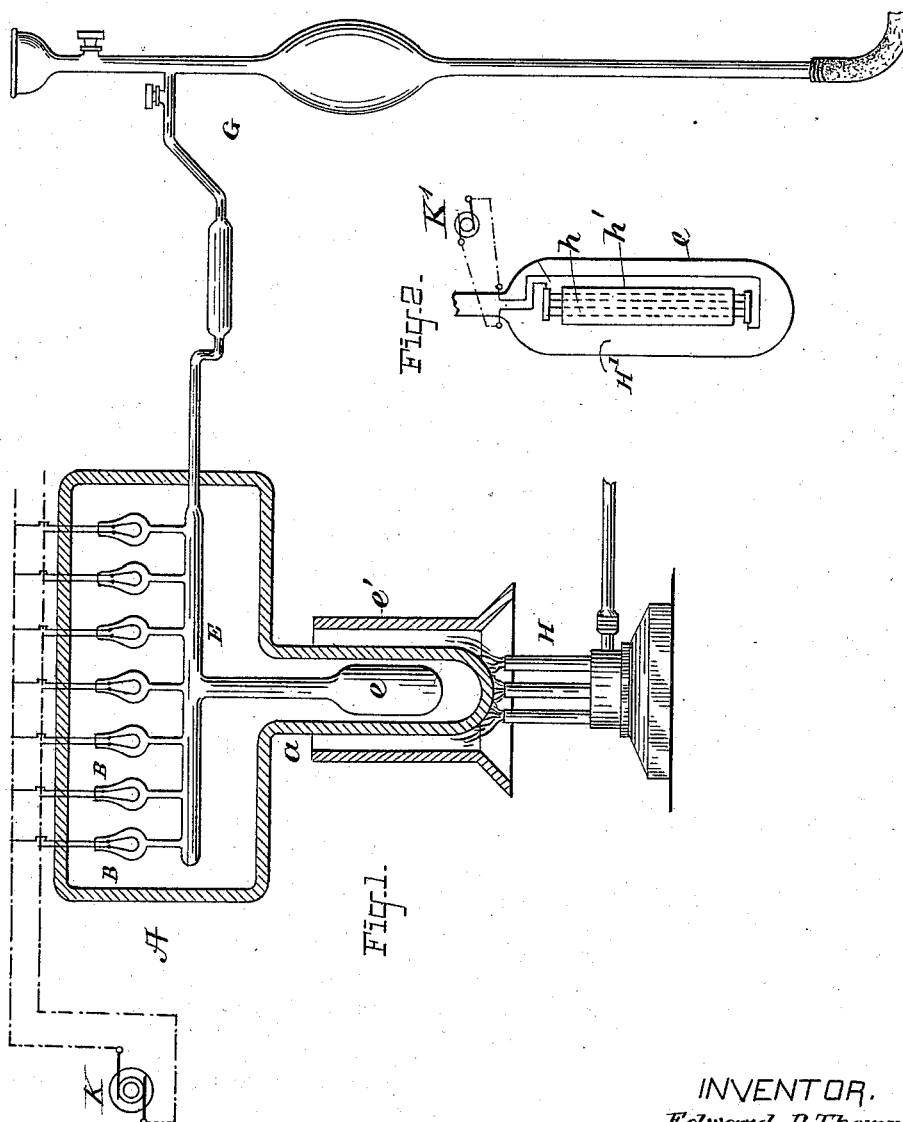


(No Model.)

E. P. THOMPSON.
EVACUATING ELECTRIC LAMPS.

No. 383,676.

Patented May 29, 1888.



ATTEST:
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UNITED STATES PATENT OFFICE.

EDWARD P. THOMPSON, OF ELIZABETH, NEW JERSEY.

EVACUATING ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 383,676, dated May 29, 1888.

Application filed April 15, 1887. Serial No. 234,969. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. THOMPSON, a citizen of the United States, residing in Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Evacuating Electric Lamps, of which the following is a specification.

The invention relates to a method of and apparatus for evacuating the globes of incandescent electric lamps.

The object of the invention is to provide means for increasing the vacuum which can be obtained by the former process of evacuation.

The invention consists, in general terms, in applying to the vacuum apparatus a series of incandescent electric-lamp globes, and a device for heating the globes, consisting of resistance-conductors, and an evacuated chamber connected with the globes containing the conductors, and in placing the conductors in an electric circuit.

The invention will be described in connection with the accompanying drawings, in which—

Figure 1 illustrates an apparatus adapted to carry out the invention, and Fig. 2 illustrates a modification.

Referring to the figures, A represents a suitable inclosing-case for retaining heat, and it is preferably placed around the globes B B of incandescent electric lamps, after they have been exhausted by the usual processes, and after the filaments have been heated for the purpose of aiding in expelling gases therefrom during the process of evacuating. The electric current from a generator, K, may be employed for thus heating the filaments; but this may be withdrawn from the filaments at this stage. While the evacuating-pump G is still being operated for the purpose of withdrawing the atmosphere in the usual manner, the air in the inclosing-case A and the glass of the bulbs and the evacuating-tube E are heated to a very high temperature. The heat may be applied by means of suitable gas-burners—such, for instance, as Bunsen burners—as shown at H. These are applied to an extension, *e*, of the tube E, this extension being preferably of thick glass. This extension *e* passes within a tube, *a*, extending from the lower portion of the case A, and a hood or sleeve, *e'*, surrounds

this tube. The flame from the burners passes in contact with the extension *a* within the hood *e'*, thus heating the extension *e* to a red heat.

This heat is conveyed to the atmosphere surrounding the globes B and raises them to a very high temperature. The rarefied gases within the bulbs is thus heated and its pressure increases gradually. The continued operation of the pump G will therefore withdraw more of the atmosphere and gradually increase the vacuum of the globes. After the globes have been thus evacuated to their greatest extent it is preferable to allow them to cool gradually, and the case A, being made of suitable heat-retaining material, preferably of some metal—such, for instance, as iron—will retain the heat a considerable time, and as it gradually cools the lamps are allowed to cool slowly, thus tempering the glass. The lamps are sealed off in the usual manner after they have been cooled, and the case A is removed.

The heat may be applied by other means than the burners H—as, for instance, an electric heater, H', may be employed. This consists of a series of conductors, *h*, having high resistance—such, for instance, as carbon rods placed within a metal casing, *h'*, which is placed in the extension *e*, and in this manner the conductors *h* are in a high vacuum at the time that they are connected in the circuit with a generator, *k*, or other suitable source of electricity.

It is evident that the heat may be applied with useful effect from the beginning to the end of the exhausting process.

I claim as my invention—

The combination, with a vacuum apparatus and a series of incandescent-electric-lamp globes connected therewith, of a device for heating the globes, consisting of a series of resistance-conductors, an evacuated chamber connected with the globes containing the conductors, and means for placing the conductors in an electric circuit.

In testimony whereof I have hereunto subscribed my name this 1st day of April, A. D. 1887.

EDWARD P. THOMPSON.

Witnesses:

DANL. W. EDGECOMB,
CHARLES A. TERRY.