

UNITED STATES PATENT OFFICE.

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METHOD OF MANUFACTURING CARBORUNDUM FILAMENTS.

1,048,231.

Specification of Letters Patent.

Patented Dec. 24, 1912.

No Drawing.

Application filed December 4, 1909. Serial No. 531,358.

To all whom it may concern:

Be it known that I, FRANK C. THOMS, a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have made a new and useful Invention in Methods of Manufacturing Carborundum Filaments, of which the following is a specification.

This invention relates to the method of manufacturing carborundum (carbide of silicon) filaments for use either as heaters or glowers in second class conductor lamps or the like, or as glowers for vacuum lamps.

Carborundum filaments have heretofore been manufactured by flashing a carbon core in an atmosphere of a mixture of hydrogen and ethylene gases and the vapors of silicon tetrachlorid, and so far as I know, the vapors of silicon tetrachlorid have been derived by passing the hydrogen and ethylene gases on their way to the flashing jar through a vessel or tube containing liquid silicon tetrachlorid. I have found that while this method may be used with some success in a laboratory, in a commercial sense it is practically useless as the filaments produced by it are not uniform.

An object of this invention is to produce a commercial method for manufacturing carborundum filaments. In carrying out my method the flashing jar which may be of any desired shape or size is rigged so that when in position it is sealed against leak which would be occasioned by the differences in pressure to which it is subjected. Within the jar, clips are arranged for holding the filaments to be treated in the electric circuit to be used. The jar, by means of a valved connection, is connected to a source of supply of a mixture of ethylene and hydrogen gases. Another valved connection connects the jar with the interior of a container or bottle containing liquid silicon tetrachlorid. In practice it is desirable to have the several valves connected up so that they can be operated by a single lever turned to different positions. The jar is also connected by means of a valved connection to an exhausting device, such as a

vacuum pump, and in this connection is included a vacuum measuring device such as a mercury column. In operation after a filament has been placed in the clips and the jar closed the jar is exhausted. When this occurs the valve between the vacuum producing device and the jar is closed and the connection between the jar and the container for the silicon tetrachlorid is opened until the mercury drops a certain distance (say six inches). The valve between the silicon tetrachlorid container and the jar is then closed and the other connection admitting the mixture of hydrogen and ethylene gases is then opened and these gases are admitted until the mercury in the column has dropped (say fourteen inches) at which time the valve will be closed and the current turned on which is utilized for flashing the carbon filament. Of course in series with the filament suitable electrical measuring devices are placed so that when the conductivity of the filament has reached the desired point, the same will be registered and further current can be cut off and the flashing stopped.

In preparing the gases for the flashing atmosphere it is well to see that the hydrogen is free of oxygen and moisture and the desired mixture of hydrogen and ethylene gases is 2% of ethylene gas and 98% of hydrogen.

Having thus described my invention, what I claim is:

The method of manufacturing a carborundum filament which consists in admitting to an evacuated flashing jar a predetermined amount of the vapors of silicon tetrachlorid then a predetermined amount of a mixture of hydrogen and ethylene gases and then in flashing a carbon core in such atmosphere.

In testimony whereof, I have hereunto subscribed my name this 1st day of December, 1909.

FRANK C. THOMS.

Witnesses:

MAX HARRIS,
B. F. FUNK.