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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in Mercury Vapour Halogen Discharge Lamps

We, PHILIPS ELECTRONIC AND ASSOCIATED INDUSTRIES LIMITED, of Abacus House, 33 Gutter Lane, London, E.C.2., a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a mercury vapour discharge lamp in which the discharge space contains not only mercury and a rare gas, but also one or more halides, more particularly iodides.

Mercury vapour discharge lamps with the aforementioned addition of halides in the discharge space have been known for various uses. In accordance with the desired effect, halides of different elements are used. It has been suggested, for example, to use the iodides of the elements gallium, thallium and indium in the discharge space in order to improve the spectrum emitted by the lamps.

These discharge lamps are generally high pressure lamps, that is to say lamps in which the discharge is contracted during operation. In operation, the overall vapour pressure generally lies between 1 and 50 atmospheres. The wall load then amounts to 5 to 35 W/cm^2. The most important advantage of these lamps is their very high output.

The spectral distribution of the emitted radiation naturally depends upon the quantities of the various elements in the discharge space and upon their relative ratios. (In this case, the rare gas hardly plays a part and only serves to facilitate the ignition). These ratios may be chosen so that the spectrum of the radiation emitted by the lamps is suitable for a given use, for example, for illumination. The light outputs of these known lamps are considerably higher than those of the corresponding lamps which only contain mercury (and a rare gas). Outputs between 50 and 100 lumen/W have already been realized.

In general, the aforementioned known lamps are high-pressure discharge lamps of comparatively small dimensions. The length of the discharge space generally does not exceed 15 cms and the diameter generally lies between 6 and 20 mms. The discharge in these lamps may be both wall-stabilized and electrode-stabilized. Small discharge lamps are less suitable for use in many photo-chemical processes, since large surfaces must frequently be irradiated at the same time. This more particularly holds for photo-copying methods, but also for the irradiation of continuously flowing liquids in which chemical reactions have to take place. An example thereof is found in the synthetic substance industry for the manufacture of caprolactan, which is a starting substance for the nylon manufacture. For certain processes, lamps are manufactured which have a length of even more than 1 metre. Also in such lamps the discharge may be contracted so that a high-pressure lamp is concerned. In these long lamps, the discharge is naturally well-stabilized.

For many of the aforementioned photo-chemical processes, it is not necessary that the energy in the discharge is converted to a high degree into visible radiation, but it is desirable that a strong radiation is emitted in a wave range lying between 350 and 450 nm. The mercury spectrum has a plurality of strong lines in this range, it is true, but it is desirable to increase the amount of energy in this range, if necessary at the expense of radiation above 450 nm and below 350 nm. This is the object of the invention.

The present invention provides a high-pressure mercury vapour halogen discharge lamp having a discharge space which contains mercury, rare gas, a halogen, lead and optionally gallium and/or indium, wherein the discharge space contains from 0.004 to 0.12 mgs. of lead per cubic cm. and a quantity of halogen which is chemically equivalent to at least

[Price 4s. 6d.]