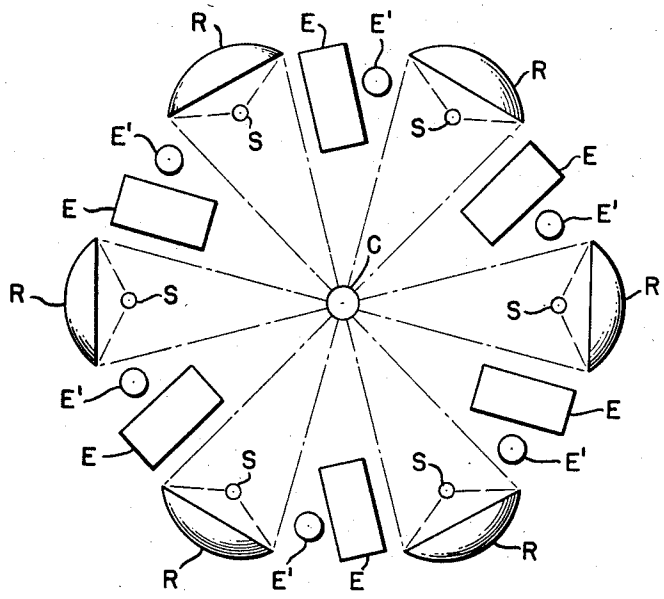
March 1, 1960 G. J. WENDELKEN 2,927,187

HIGH INTENSITY ELECTRICAL RADIATION OR MULTI-ELEMENT IMAGE FURNACE

Filed Dec. 30, 1957



INVENTOR.
Gerard J. Wendelken

BY

L. S. Saulsbury

ATTORNEY

United States Patent Office

2,927,187

Patented Mar. 1, 1960

2,927,187

HIGH INTENSITY ELECTRICAL RADIATION OR MULTI-ELEMENT IMAGE FURNACE

Gerard J. Wendelken, New York, N.Y., assignor, by mesne assignments, to Waltham Precision Instrument Company, Inc., Waltham, Mass., a corporation of Massachusetts

Application December 30, 1957, Serial No. 705,974

1 Claim. (Cl. 219—34)

This invention relates to an electrical radiation or multi-element image furnace that is used for the generation of high intensity thermal energy.

It is the principal object of this invention to provide an electrical radiation or multi-element image furnace that will generate thermal energy and very high temperatures suitable for use in the research laboratory and in industrial applications for analysis of metals and their alloys, ceramics, gases, chemicals to determine their fundamental characteristics and properties, such as their melting point, resistance to high heat, emissivity, their performance under high temperature conditions and also for the refinement of materials of extremely high purity.

It is another object of the invention to provide an electrical radiation or multi-element image furnace which permits the testing of materials without exposing the samples to impurities and contaminating influences, under a high temperature source of pure heat, free of electric and magnetic fields, and in any desired type of atmosphere, either under pressure or in a vacuum.

It is still another object of the invention to provide an electrical radiation or multi-element image furnace that can generate an extremely dense heat flux over relatively large dimensional areas, and in which the amount of heat can be controlled, manually or automatically.

It is a further object of the invention to provide a radiation furnace that will be capable of simulating some of the conditions prevailing in the operation of nuclear devices.

Other objects of the invention are to provide an electrical radiation or multi-element image furnace, having the above objects in mind, which is of simple construction, operable independently of sun rays or other intermittent sources of radiant energy, inexpensive to manufacture, relatively compact, effective and efficient in operation, is assembled for sectionalization of the individual radiant source assemblies, can be used for thermo-chemical and pyro-metallurgical studies and analysis, suitable for zone refining of precious or rare metals, crystal development, thermal shock, thermal cycling of materials and permits attainment of rapid changes in temperature under controlled conditions.

For a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which

A single figure is a layout view illustrating the arrangement of the radiant source assemblies constituting this invention.

According to the present invention, there is provided generally assemblies of elliptical reflectors R having near and distant focal points C and S and in an arc or circular manner so that the distant focal points and images are imposed upon one another at a common point C. At the near focal point of each reflector, there is disposed a source S of high intense radiant energy, such as may be derived from a carbon arc. The radiant energy from each individual source is thus directed by the elliptical reflectors to the same common or distant focal point located at the center of the circle and will thereat generate high intensity thermal energy into which the samples or work material may be thrust.

The reflectors R are circumferentially-spaced from one another to accommodate control equipment E and E' for the radiant heat sources. While only six reflectors R are shown, it shall be understood that more or less reflectors can be used. If more reflectors are used the control equipment E and E' may be disposed above or below the reflectors instead of between them as illustrated. It should also be apparent that multiple rows of elliptical reflectors R can be provided and arranged in the form of a sphere with each of the reflectors having their distant focal points located at the center of the sphere. Only the elliptical type of reflector has the two focal points and with the distant focal points being such that they come within convenient range of one another the assemblies can be brought together in close assembled relationship within furnace walls.

While various changes may be made in the detail construction, it shall be understood that such changes will be within the spirit and scope of the present invention as defined by the appended claim.

What is claimed is:

A high-intensity electrical radiation multi-element image furnace comprising a plurality of independently controllable elliptical reflector assemblies, each of said elliptical reflector assemblies having near and distant focal points and a radiant energy heat source disposed at the near focal point, said reflector assemblies being arranged in the form of a sphere with their distant focal points being imposed upon one another at the center of the sphere said reflector assemblies being circumferentially spaced from one another and independent control equipment for the radiant energy heat source of each of the reflector assemblies disposed respectively between and adjacent to the respective assemblies.

References Cited in the file of this patent

UNITED STATES PATENTS

1,278,026	Salto	Sept. 3, 1918
1,762,325	Blair et al.	June 10, 1930
2,315,124	Luzius	Mar. 30, 1943

FOREIGN PATENTS

186,449	Great Britain	Oct. 5, 1922
387,901	Germany	Jan. 5, 1924
484,199	Great Britain	Apr. 28, 1938
856,196	Germany	Nov. 20, 1952
1,022,227	France	Dec. 10, 1952
1,051,784	France	Sept. 23, 1953
938,499	Germany	Feb. 2, 1956