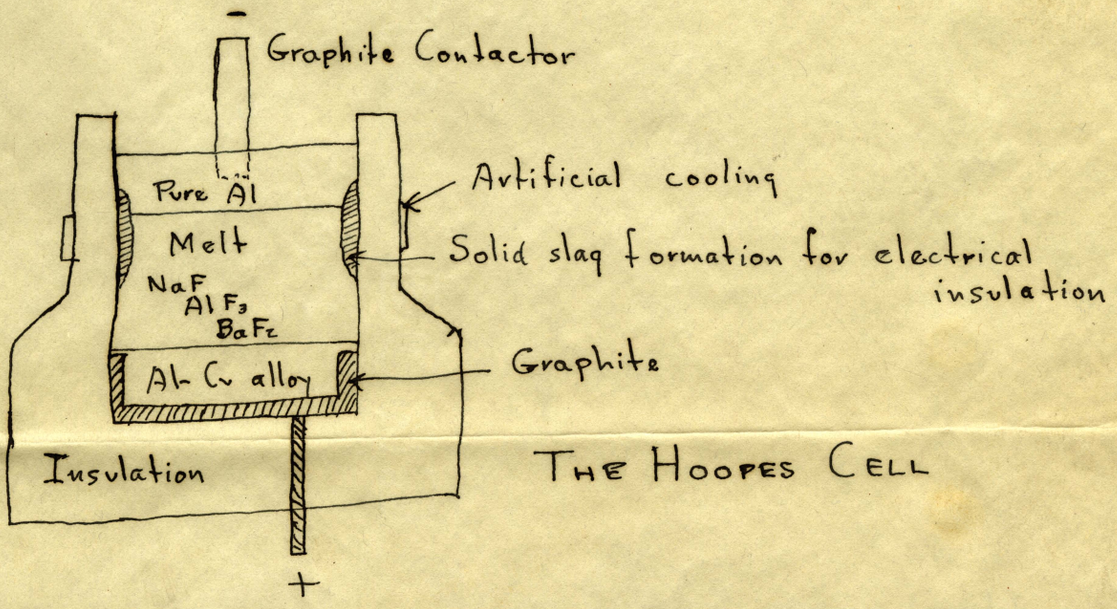
Cleveland, Ohio,
May 17, 1933.

TO WHOM IT MAY CONCERN:

THE HOOPES ALUMINUM REFINING PROCESS

A detailed description is given in the Journal of American Electrochemical Society, 47, (1925) 275, by F. C. Frary. Dr. Frary collaborated with Dr. Hoopes in the work which was performed in the research laboratory of the Aluminum Company of America.



The process consists essentially of electrolyzing Aluminum out of a molten Cu - Al alloy, and depositing it from a comparatively dense bath into a layer of pure, molten Al, which, by virtue of its low density, floats on top of the bath. Of all the metals present in the alloy, Al is highest in the electromotive series, and thus is the only one to dissolve. Thus the electrotype is kept free of metals lower in the series than Al, and Al of 99.95 plus per cent purity is deposited.

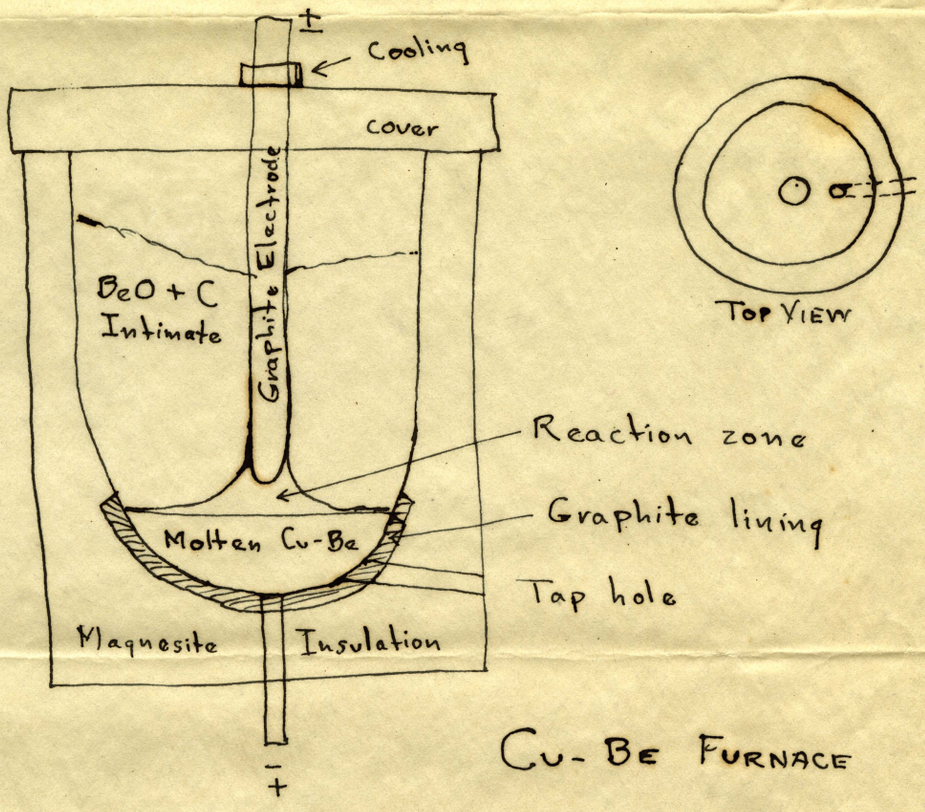
The operation of the Hoopes Cell is claimed to be very simple and dependable. The materials are charged in the molten state. The spent alloy is tapped off, and more is added through a graphite funnel. A very high current efficiency, probably because of the violent exhibition of the Hall Effect, which, at times, even threatens to mix the two metal layers. is possible

This process is applied by me to beryllium because:

1. It apparently offers a general method by which pure Be could be produced. Pure Be, while being a sad rarity, ought to be saleable, at least, for museum and experimental use for good money. Other uses will follow.

2. It may be an important commercial method for Be production, since it would seem that only a small amount of impurity is allowable. This may be more nearly true if the production of Be - Cu is as easy as it appears to be, and if this industry (Be - Cu) becomes of major importance. The spent alloy from the modified Hoopes Cell would be good enough for the alloy trade, especially if it is reinforced with more Be.

AND, I respectfully present a furnace design for the manufacture of Be - Cu alloys from Be O, C and Cu.



Cu-Be Furnace

This furnace has the following features:

1. In the hottest region of the furnace, BeO, C and Cu are always in intimate contact with each other.
2. Cu vapor would condense in contact with BeO and C .
3. Control of temperature can probably be gauged by the appearance of the flame.
4. Operation would be semi-continuous, and simple. To start, the required amount of Cu would be put in and melted. Then the BeO - C mixture, containing only a slight excess of C, would be charged, and full power turned on. Completion of the reaction would probably be manifest in the amount of Cu vapor issuing from the furnace, since the reaction is endothermic. Then more BeO - C mix could be charged, if desired. The finished alloy is tapped off into a ladle and cast.

P. L. Patterson

State of Ohio }
County of Cuyahoga } ss.

Sworn to and subscribed in my presence this 17th day of May, 1933.

Chester B Scott
Notary Public

My commission expires Apr. 5, 1936