

The Herreshoff forehearth has its greatest advantage from the application of this principle, carrying the slag overflow well above the tap hole of the furnace, and periodically tapping matte as it accumulates. In the early 80's, John L. Thomson, Superintendent of the Orford Works of New Jersey, adopted a form of forehearth, now known as the Orford syphon-tap, whereby on tapping the furnace a constant flow of matte and slag is maintained whilst no attempt is made to maintain the separation existing in the furnace. This is very successfully used for copper smelting where the matte fall is heavy, and I have used it on lead furnaces with satisfaction. This is simply a rectangular settling box with a division wall having an aperture at the bottom through which matte is permitted to flow, and rise in the second compartment, whence it flows at a level slightly lower than that of slag in the first compartment. In lead smelting, with ores such as the metallurgist of to-day is called on to treat, one has not only to contend with the prills or granules of matte, so difficult to separate completely from the slag when both flow intermittently from the

furnace, but there is also that agglomeration, hardly matte, which chills so readily, and rapidly builds up the settler, necessitating so frequent change and such labour to break up; and again that elusive zinc sulphide which declines to settle, but floats gaily, carrying its quota of silver into the slag flume.

It was after enlarging our forehearths, using a secondary conical pot, and even a third, improvising an Orford syphon-tap, etc. that Mr. Harris thought out the device now in use and giving excellent satisfaction. It is patented under the name of the Harris Distributor, as it distributes the matte and slag already separated in the furnace. This distributor combines the essential principles of the Herreshoff forehearth and the Orford syphon-tap, improving on the former in that its first compartment is virtually a continuation of the surface of the furnace crucible, having a free flow through an orifice 10 inches long by 5 inches high instead of connected therewith by a small tap hole. I can best describe this apparatus by quoting from Mr. Harris as follows:—

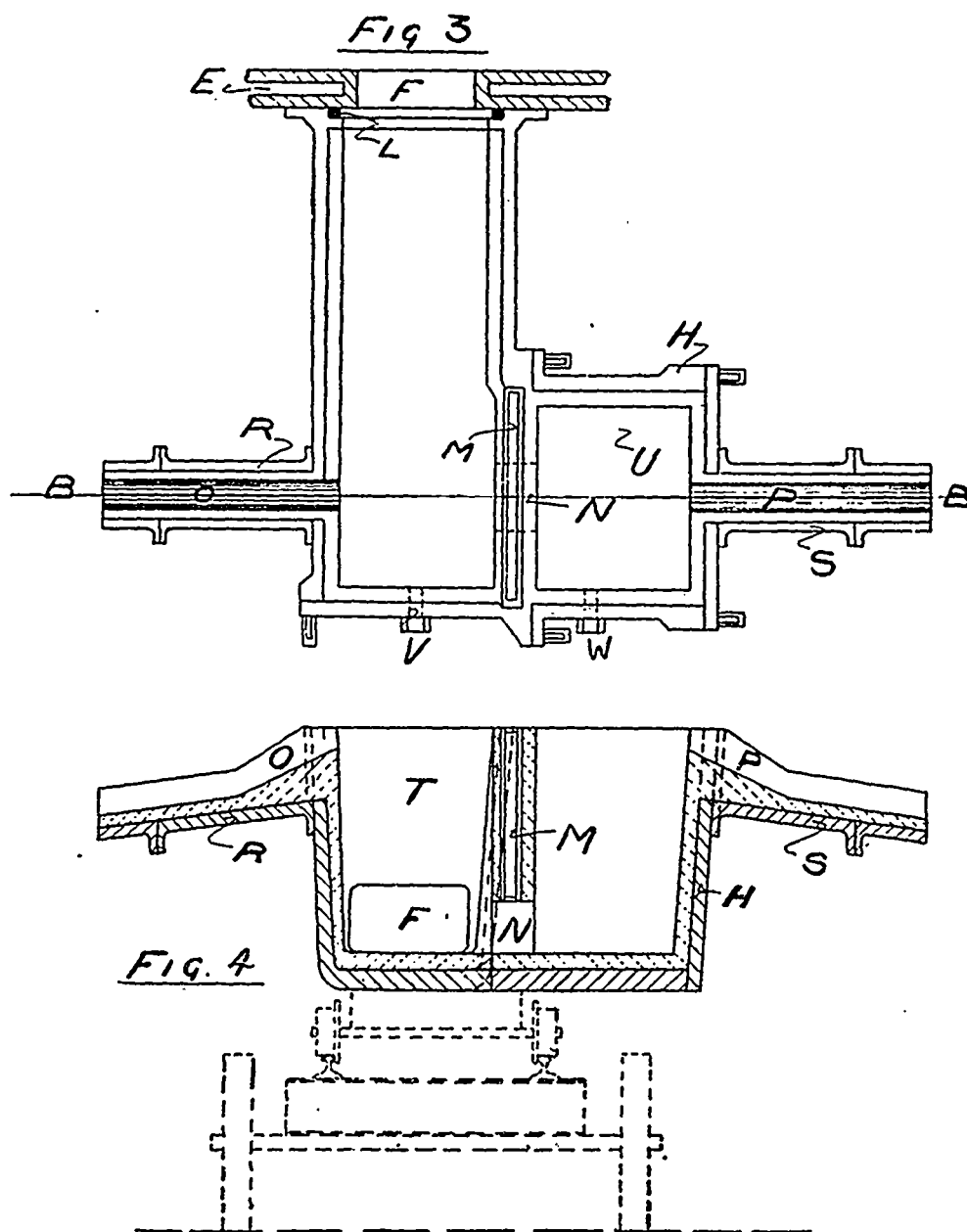


FIG. 3—Plan of Apparatus. FIG. 4—Vertical Section on the line B B, FIG. 3.