

Device for three-dimensional printing of metal products enables sequential formation of metal layers of parts with complex geometries and double-curved surfaces in a vacuum using an electron beam and the formation of a molten metal bath. It comprises a process vacuum chamber, a metal substrate for positioning the metal layers, a numerical control system, a mechanism for feeding consumable material in the form of coiled metal wire, a consumable material guide device, an electron gun with a ring cathode and an aperture that forms an electron beam in the shape of a hollow inverted cone, with its apex in the molten bath formation zone under the action of an adjustable accelerating voltage within it, and a mechanism for the controlled movement of the metal substrate with the molten bath. The electron gun is mounted on a two-axis rotary drive with serially connected servomotors, positioned by a numerical control system around the X and Y coordinate axes. The consumable material guide device contains a system of independent drives, which, via spherical joints and fixed-length rods, are connected to individual sliders on the guide drives and, via a numerical control system, determine the orientation of the consumable material in the form of a metal wire coaxially with the aperture of the electron gun annular cathode.