



## Geoengineering Related Patents



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### United States Patent and Trademark Office

- [0462795](#) – July 16, 1891 – Method Of Producing Rain-Fall
- [1103490](#) – August 6, 1913 – Rain-Maker
- [1225521](#) – September 4, 1915 – Protecting From Poisonous Gas In Warfare
- [1338343](#) – April 27, 1920 – Process And Apparatus For The Production of Intense Artificial Clouds, Fogs, or Mists
- [1619183](#) – March 1, 1927 – Process of Producing Smoke Clouds From Moving Aircraft
- [1631753](#) – June 7, 1927 – Electric Heater
- [1665267](#) – April 10, 1928 – Process of Producing Artificial Fogs
- [1892132](#) – December 27, 1932 – Atomizing Attachment For Airplane Engine Exhausts

- [1928963](#) – October 3, 1933 – Electrical System And Method
- [1957075](#) – May 1, 1934 – Airplane Spray Equipment
- [2097581](#) – November 2, 1937 – Electric Stream Generator – Referenced in 3990987
- [2409201](#) – October 15, 1946 – Smoke Producing Mixture
- [2476171](#) – July 18, 1945 – Smoke Screen Generator
- [2480967](#) – September 6, 1949 – Aerial Discharge Device
- [2550324](#) – April 24, 1951 – Process For Controlling Weather
- [2582678](#) – June 15, 1952 – Material Disseminating Apparatus For Airplanes
- [2591988](#) – April 8, 1952 – Production of TiO<sub>2</sub> Pigments – Referenced in 3899144
- [2614083](#) – October 14, 1952 – Metal Chloride Screening Smoke Mixture
- [2633455](#) – March 31, 1953 – Smoke Generator
- [2688069](#) – August 31, 1954 – Steam Generator – Referenced in 3990987
- [2721495](#) – October 25, 1955 – Method And Apparatus For Detecting Minute Crystal Forming Particles Suspended in a Gaseous Atmosphere
- [2730402](#) – January 10, 1956 – Controllable Dispersal Device
- [2801322](#) – July 30, 1957 – Decomposition Chamber for Monopropellant Fuel – Referenced in 3990987
- [2881335](#) – April 7, 1959 – Generation of Electrical Fields
- [2908442](#) – October 13, 1959 – Method For Dispersing Natural Atmospheric Fogs And Clouds
- [2986360](#) – May 30, 1962 – Aerial Insecticide Dusting Device
- [2963975](#) – December 13, 1960 – Cloud Seeding Carbon Dioxide Bullet
- [3126155](#) – March 24, 1964 – Silver Iodide Cloud Seeding Generator

- [3127107](#) – March 31, 1964 – Generation of Ice-Nucleating Crystals
- [3131131](#) – April 28, 1964 – Electrostatic Mixing in Microbial Conversions
- [3174150](#) – March 16, 1965 – Self-Focusing Antenna System
- [3234357](#) – February 8, 1966 – Electrically Heated Smoke Producing Device
- [3274035](#) – September 20, 1966 – Metallic Composition For Production of Hydrosopic Smoke
- [3300721](#) – January 24, 1967 – Means For Communication Through a Layer of Ionized Gases
- [3313487](#) – April 11, 1967 – Cloud Seeding Apparatus
- [3338476](#) – August 29, 1967 – Heating Device For Use With Aerosol Containers
- [3410489](#) – November 12, 1968 – Automatically Adjustable Airfoil Spray System With Pump
- [3429507](#) – February 25, 1969 – Rainmaker
- [3432208](#) – November 7, 1967 – Fluidized Particle Dispenser
- [3441214](#) – April 29, 1969 – Method And Apparatus For Seeding Clouds
- [3445844](#) – May 20, 1969 – Trapped Electromagnetic Radiation Communications System
- [3456880](#) – July 22, 1969 – Method Of Producing Precipitation From The Atmosphere
- [3518670](#) June 30, 1970 – Artificial Ion Cloud
- [3534906](#) – October 20, 1970 – Control of Atmospheric Particles
- [3545677](#) – December 8, 1970 – Method of Cloud Seeding
- [3564253](#) – February 16, 1971 – System And Method For Irradiation Of Planet Surface Areas

- [3587966](#) – June 28, 1971 – Freezing Nucleation
- [3601312](#) – August 24, 1971 – Methods of Increasing The Likelihood of Precipitation By The Artificial Introduction Of Sea Water Vapor Into The Atmosphere Winward Of An Air Lift Region
- [3608810](#) – September 28, 1971 – Methods of Treating Atmospheric Conditions
- [3608820](#) – September 20, 1971 – Treatment of Atmospheric Conditions by Intermittent Dispensing of Materials Therein
- [3613992](#) – October 19, 1971 – Weather Modification Method
- [3630950](#) – December 28, 1971 – Combustible Compositions For Generating Aerosols, Particularly Suitable For Cloud Modification And Weather Control And Aerosolization Process
- [USRE29142](#) – May 22, 1973 – Combustible compositions for generating aerosols, particularly suitable for cloud modification and weather control and aerosolization process
- [3659785](#) – December 8, 1971 – Weather Modification Utilizing Microencapsulated Material
- [3666176](#) – March 3, 1972 – Solar Temperature Inversion Device
- [3677840](#) – July 18, 1972 – Pyrotechnics Comprising Oxide of Silver For Weather Modification Use
- [3722183](#) – March 27, 1973 – Device For Clearing Impurities From The Atmosphere
- [3769107](#) – October 30, 1973 – Pyrotechnic Composition For Generating Lead Based Smoke
- [3784099](#) – January 8, 1974 – Air Pollution Control Method
- [3785557](#) – January 15, 1974 – Cloud Seeding System
- [3795626](#) – March 5, 1974 – Weather Modification Process
- [3808595](#) – April 30, 1974 – Chaff Dispensing System

- [3813875](#) – June 4, 1974 – Rocket Having Barium Release System to Create Ion Clouds In The Upper Atmosphere
- [3835059](#) – September 10, 1974 – Methods of Generating Ice Nuclei Smoke Particles For Weather Modification And Apparatus Therefore
- [3835293](#) – September 10, 1974 – Electrical Heating Apparatus For Generating Super Heated Vapors
- [3877642](#) – April 15, 1975 – Freezing Nucleant
- [3882393](#) – May 6, 1975 – Communications System Utilizing Modulation of The Characteristic Polarization of The Ionosphere
- [3896993](#) – July 29, 1975 – Process For Local Modification of Fog And Clouds For Triggering Their Precipitation And For Hindering The Development of Hail Producing Clouds
- [3899129](#) – August 12, 1975 – Apparatus for generating ice nuclei smoke particles for weather modification
- [3899144](#) – August 12, 1975 – Powder contrail generation
- [3940059](#) – February 24, 1976 – Method For Fog Dispersion
- [3940060](#) – February 24, 1976 – Vortex Ring Generator
- [3990987](#) – November 9, 1976 – Smoke generator
- [3992628](#) – November 16, 1976 – Countermeasure system for laser radiation
- [3994437](#) – November 30, 1976 – Broadcast dissemination of trace quantities of biologically active chemicals
- [4042196](#) – August 16, 1977 – Method and apparatus for triggering a substantial change in earth characteristics and measuring earth changes
- [RE29,142](#) – February 22, 1977 – Combustible compositions for generating aerosols, particularly suitable for cloud modification and weather control and aerosolization process

- [4035726](#) – July 12, 1977 – Method of controlling and/or improving high-latitude and other communications or radio wave surveillance systems by partial control of radio wave et al
- [4096005](#) – June 20, 1978 – Pyrotechnic Cloud Seeding Composition
- [4129252](#) – December 12, 1978 – Method and apparatus for production of seeding materials
- [4141274](#) – February 27, 1979 – Weather modification automatic cartridge dispenser
- [4167008](#) – September 4, 1979 – Fluid bed chaff dispenser
- [4347284](#) – August 31, 1982 – White cover sheet material capable of reflecting ultraviolet rays
- [4362271](#) – December 7, 1982 – Procedure for the artificial modification of atmospheric precipitation as well as compounds with a dimethyl sulfoxide base for use in carrying out said procedure
- [4402480](#) – September 6, 1983 – Atmosphere modification satellite
- [4412654](#) – November 1, 1983 – Laminar microjet atomizer and method of aerial spraying of liquids
- [4415265](#) – November 15, 1983 – Method and apparatus for aerosol particle absorption spectroscopy
- [4470544](#) – September 11, 1984 – Method of and Means for weather modification
- [4475927](#) – October 9, 1984 – Bipolar Fog Abatement System
- [4600147](#) – July 15, 1986 – Liquid propane generator for cloud seeding apparatus
- [4633714](#) – January 6, 1987 – Aerosol particle charge and size analyzer
- [4643355](#) – February 17, 1987 – Method and apparatus for modification of climatic conditions
- [4653690](#) – March 31, 1987 – Method of producing cumulus clouds

- [4684063](#) – August 4, 1987 – Particulates generation and removal
- [4686605](#) – August 11, 1987 – HAARP Patent / EASTLUND PATENT – Method and apparatus for altering a region in the earth's atmosphere, ionosphere, and/or magnetosphere
- [4704942](#) – November 10, 1987 – Charged Aerosol
- [4712155](#) – December 8, 1987 – Method and apparatus for creating an artificial electron cyclotron heating region of plasma
- [4744919](#) – May 17, 1988 – Method of dispersing particulate aerosol tracer
- [4766725](#) – August 30, 1988 – Method of suppressing formation of contrails and solution therefor
- [4829838](#) – May 16, 1989 – Method and apparatus for the measurement of the size of particles entrained in a gas
- [4836086](#) – June 6, 1989 – Apparatus and method for the mixing and diffusion of warm and cold air for dissolving fog
- [4873928](#) – October 17, 1989 – Nuclear-sized explosions without radiation
- [4948257](#) – August 14, 1990 – Laser optical measuring device and method for stabilizing fringe pattern spacing
- [1338343](#) – August 14, 1990 – Process and Apparatus for the production of intense artificial Fog
- [4999637](#) – March 12, 1991 – Creation of artificial ionization clouds above the earth
- [5003186](#) – March 26, 1991 – Stratospheric Welsbach seeding for reduction of global warming
- [5005355](#) – April 9, 1991 – Method of suppressing formation of contrails and solution therefor
- [5038664](#) – August 13, 1991 – Method for producing a shell of relativistic particles at an altitude above the earths surface

- [5041760](#) – August 20, 1991 – Method and apparatus for generating and utilizing a compound plasma configuration
- [5041834](#) – August 20, 1991 – Artificial ionospheric mirror composed of a plasma layer which can be tilted
- [5056357](#) – October 15, 1991- Acoustic method for measuring properties of a mobile medium
- [5059909](#) – October 22, 1991 – Determination of particle size and electrical charge
- [5104069](#) – April 14, 1992 – Apparatus and method for ejecting matter from an aircraft
- [5110502](#) – May 5, 1992 – Method of suppressing formation of contrails and solution therefor
- [5156802](#) – October 20, 1992 – Inspection of fuel particles with acoustics
- [5174498](#) – December 29, 1992 – Cloud Seeding
- [5148173](#) – September 15, 1992 – Millimeter wave screening cloud and method
- [5242820](#) - September 7, 1993 – Army Mycoplasma Patent Patent
- [5245290](#) – September 14, 1993 – Device for determining the size and charge of colloidal particles by measuring electroacoustic effect
- [5286979](#) – February 15, 1994 – Process for absorbing ultraviolet radiation using dispersed melanin
- [5296910](#) – March 22, 1994 – Method and apparatus for particle analysis
- [5327222](#) – July 5, 1994 – Displacement information detecting apparatus
- [5357865](#) – October 25, 1994 – Method of cloud seeding
- [5360162](#) – November 1, 1994 – Method and composition for precipitation of atmospheric water
- [5383024](#) – January 17, 1995 – Optical wet steam monitor



- [5425413](#) – June 20, 1995 – Method to hinder the formation and to break-up overhead atmospheric inversions, enhance ground level air circulation and improve urban air quality
- [5434667](#) – July 18, 1995 – Characterization of particles by modulated dynamic light scattering
- [5441200](#) – August 15, 1995 – Tropical cyclone disruption
- [5486900](#) – January 23, 1996 – Measuring device for amount of charge of toner and image forming apparatus having the measuring device
- [5556029](#) – September 17, 1996 – Method of hydrometeor dissipation (clouds)
- [5628455](#) – May 13, 1997 – Method and apparatus for modification of supercooled fog
- [5631414](#) – May 20, 1997 – Method and device for remote diagnostics of ocean-atmosphere system state
- [5639441](#) – June 17, 1997 – Methods for fine particle formation
- [5762298](#) – June 9, 1998 – Use of artificial satellites in earth orbits adaptively to modify the effect that solar radiation would otherwise have on earth's weather
- [5800481](#) – September 1, 1998 – Thermal excitation of sensory resonances
- [5912396](#) – June 15, 1999 – System and method for remediation of selected atmospheric conditions
- [5922976](#) – July 13, 1999 – Method of measuring aerosol particles using automated mobility-classified aerosol detector
- [5949001](#) – September 7, 1999 – Method for aerodynamic particle size analysis
- [5984239](#) – November 16, 1999 – Weather modification by artificial satellite
- [6025402](#) – February 15, 2000 – Chemical composition for effectuating a reduction of visibility obscuration, and a detoxification of fumes and chemical fogs in spaces of fire origin

- [6030506](#) – February 29, 2000 – Preparation of independently generated highly reactive chemical species
- [6034073](#) – March 7, 2000 – Solvent detergent emulsions having antiviral activity
- [6045089](#) – April 4, 2000 – Solar-powered airplane
- [6056203](#) – May 2, 2000 – Method and apparatus for modifying supercooled clouds
- [6110590](#) – August 29, 2000 – Synthetically spun silk nanofibers and a process for making the same
- [6263744](#) – July 24, 2001 – Automated mobility-classified-aerosol detector
- [6281972](#) – August 28, 2001 – Method and apparatus for measuring particle-size distribution
- [6315213](#) – November 13, 2001 – Method of modifying weather
- [6382526](#) – May 7, 2002 – Process and apparatus for the production of nanofibers
- [6408704](#) – June 25, 2002 – Aerodynamic particle size analysis method and apparatus
- [6412416](#) – July 2, 2002 – Propellant-based aerosol generation devices and method
- [6520425](#) – February 18, 2003 – Process and apparatus for the production of nanofibers
- [6539812](#) – April 1, 2003 – System for measuring the flow-rate of a gas by means of ultrasound
- [6553849](#) – April 29, 2003 – Electrodynamic particle size analyzer
- [6569393](#) – May 27, 2003 – Method And Device For Cleaning The Atmosphere
- [0056705 A1](#) – March 17, 2005 – Weather Modification by Royal Rainmaking Technology
- [6890497](#) – May 10, 2005 – Method For Extracting And Sequestering Carbon Dioxide

- [7965488](#) – November 9, 2007 – Methods Of Removing Aerosols From The Atmosphere
- [8048309](#) – August 28, 2008 – Seawater-Based Carbon Dioxide Disposal
- [8012453](#) – October 27, 2008 – Carbon Sequestration And Production Of Hydrogen And Hydride
- [7645326](#) – January 12, 2010 – RFID environmental manipulation
- [7655193](#) – February 2, 2010 – Apparatus For Extracting And Sequestering Carbon Dioxide
- [8079545](#) – December 20, 2011 – Ground based Manipulation and Control of Aerial Vehicle during nonflying operations
- [0117003](#) – October 5, 2012 – Geoengineering Method Of Business Using Carbon Counterbalance Credits – [alternate link](#)
- [8373962](#) – February 12, 2013 – Charged seed cloud as a method for increasing particle collisions and for scavenging airborne biological agents and other contaminants