

Extensive List of Geoengineering Patents

United States Patent and Trademark Office

(Click the patent number to view details.)

- [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 TiO₂ 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 Hydroscopic 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