

List of Geoengineering patents 1891-2023

United States Patent and Trademark Office

0462795 - July 16, 1891 - Method Of Producing Rain-Fall

803180 - October 31, 1905 - Means for Producing High Potential Electrical Discharges

1103490 - August 6, 1913 - Rain-Maker

1225521 - September 4, 1915 - Protecting From Poisonous Gas In Warfare

1279823 - September 24, 1918 - Process and Apparatus for Causing Precipitation by Coalescence of Aqueous Particles Contained in the Atmosphere

1284982 - November 19, 1918 - Process and Apparatus for Procuring and Stimulating Rainfall

1338343 - April 27, 1920 - Process And Apparatus For The Production of Intense Artificial Clouds, Fogs, or Mists

1358084 - November 9, 1920 - Method of Producing Fog-Screens

1619183 - March 1, 1927 - Process of Producing Smoke Clouds From Moving Aircraft

1665267 - April 10, 1928 - Process of Producing Artificial Fogs

1892132 - December 27, 1932 - Atomizing Attachment For Airplane Engine Exhausts

1895765 - January 31, 1933 - Artificial Production of Fog

1928963 - October 3, 1933 - Electrical System And Method

1957075 - May 1, 1934 - Airplane Spray Equipment

1993316 - March 5, 1935 - Apparatus for and Method of Producing Oil Fog

2052626 - September 1, 1936 - Method of Dispelling Fog

2097581 - November 2, 1937 - Electric Stream Generator - Referenced in 3990987

2173756 - September 19, 1939 - Process of Producing Fog or Mist by Partial and Flameless Combustion

2352677 - July 4, 1944 - Artificial Fog Production

2476171 - July 18, 1945 - Smoke Screen Generator

2409201 - October 15, 1946 - Smoke Producing Mixture

2480967 - September 6, 1949 - Aerial Discharge Device

2527230 - October 24, 1950 - Method of Crystal Formation and Precipitation

2527231 - October 24, 1950 - Method of Generating Silver Iodide Smoke

2550324 - April 24, 1951 - Process For Controlling Weather

2582678 - June 15, 1952 - Material Disseminating Apparatus For Airplanes

2611992 - September 30, 1952 - Engine Exhaust Operated Fluent Material Distributor

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

2903188 - April 2, 1956 - Control of Tropical Cyclone Formation

2756097 - July 24, 1956 - Process for Weather Control

2801322 - July 30, 1957 - Decomposition Chamber for Monopropellant Fuel - Referenced in 3990987

2835530 - May 20, 1958 - Process for the Condensation of Atmospheric Humidity and Dissolution of Fog

2871344 - January 27, 1959 - Long Distance Communication System

2881335 - April 7, 1959 - Generation of Electrical Fields

2908442 - October 13, 1959 - Method For Dispersing Natural Atmospheric Fogs And Clouds

2962450 - November 29, 1960 - Fog Dispelling Composition

2963975 - December 13, 1960 - Cloud Seeding Carbon Dioxide Bullet
3019989 - February 6, 1962 - Atmospheric Space Charge Modification
2986360 - May 30, 1962 - Aerial Insecticide Dusting Device
3046168 - July 24, 1962 - Chemically Produced Colored Smokes
3056556 - October 2, 1962 - Method of Artificially Influencing the Weather
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
3140207 - July 7, 1964 - Pyrotechnic Composition
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 Hygroscopic Smoke
3284005 - November 8, 1966 - Weather Control by Artificial Means
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
3375148 - March 26, 1968 - Pyrotechnics Comprising Silver Iodate, Ammonium Nitrate, Nitrocellulose and Nitrate Esters
3378201 - April 16, 1968 - Method for Precipitating Atmospheric Water Masses
3410489 - November 12, 1968 - Automatically Adjustable Airfoil Spray System With Pump
3418184 - December 24, 1968 - Smoke Producing Propellant
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
3517512 - June 30, 1970 - Apparatus for Suppressing Contrails
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
3595477 - July 27, 1971 - Fog Dispersing Method and Compositions
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
3690552 - September 12, 1972 - Fog Dispersal
3722183 - March 27, 1973 - Device For Clearing Impurities From The Atmosphere
3748278 - July 24, 1973 - Process and Agents Having an Influence on the Weather
3751913 - August 14, 1973 - Barium Release System
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
3788543 - January 29, 1974 - Uniform Size Particle Generator
3795626 - March 5, 1974 - Weather Modification Process
3802971 - April 9, 1974 - Pyrotechnic Formulations for Weather Modification Comprising a Mixture of Iodates
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
3858805 - January 7, 1975 - Ice Nucleation by Micas
3877642 - April 15, 1975 - Freezing Nucleant
3882393 - May 6, 1975 - Communications System Utilizing Modulation of The Characteristic Polarization of The Ionosphere
3887580 - June 3, 1975 - Method of Crystallization of Water in Supercooled Clouds and Fogs and Reagent Useful in Said Method
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
3915379 - October 28, 1975 - Method of Controlling Weather
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
4009828 - March 1 1977 - Organic Nucleating Agent for both Warm and Cold Clouds
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
4373391 - February 15, 1983 - Relative Humidity Sensitive Material
4396152 - August 2, 1983 - Aerosol Dispenser System
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
4742958 - May 10, 1988 - Method for Making Artificial Snow
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
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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
5436039 - July 25, 1995 - Artificial Snow in an Aggregate Form of Snow Granules
5441200 - August 15, 1995 - Tropical cyclone disruption
5492274 - February 20, 1996 - Method of and Means for Weather Modification
5546183 - August, 13, 1996 - LIDAR Droplet Size Monitor for In-Flight Measurement of Aircraft Engine Exhaust Contrails, Droplets and Aerosols
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
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6030506 - February 29, 2000 - Preparation of independently generated highly reactive chemical species
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6045089 - April 4, 2000 - Solar-powered airplane
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6315213B1 - June 21, 2000 - Method of modifying weather
6110590 - August 29, 2000 - Synthetically spun silk nanofibers and a process for making the same
6263744 - July 24, 2001 - Automated mobility-classified-aerosol detector
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6315213 - November 13, 2001 - Method of modifying weather
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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
20040060994 - April 1, 2004 - Method for Influencing Atmospheric Formations
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2007033448 - March 29, 2007 - Production of Localized Artificial Rains in Polar Stratospheric Clouds, to Promote a Rain Wash in the CIO Gas, Reduce the Destruction of the Ozone Layer and a Replacement Process in situ of the Stratospheric Ozone
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20100170958 - July 8, 2010 - Hurricane Mitigation by Combined Seeding with Condensation and Freezing Nuclei
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