

U.S. DEPARTMENT OF ENERGY
OFFICE OF ASSISTANT GENERAL COUNSEL FOR PATENTS
RECORD OF INVENTION

DOE Case No.

This Record of Invention is an important legal document and proper care in its early and complete preparation will save important time and inconvenience in the future. The Instructions* on the back should be read carefully before filling in the data.

A. Inventor: 1. Name(s): Thomas H. Nicol, Ralph C. Niemann, John D. Gonczy
2. Title or Position: Mechanical Engineer, Mechanical Engineer, Engineering Physicist

3. Employed by: Fermi National Accelerator Laboratory
4. Permanent Address: P.O. Box 500, Batavia, Illinois 60510

B. Title of Invention (1*): Zero Heat Leak, Zero Contraction Magnet Anchor System

C. Description of Invention (2*): Uniaxial graphite reinforced (G.R.P.) tie bars fitted with metal ends are connected to existing magnet suspension components. This allows the combined bending strength of these existing components to restrain axial magnet loads. The ends of each tie bar operate at equal temperatures, eliminating heat conduction specific to the anchor system. Because uniaxial G.R.P. expands with decreasing temperature and metal contracts, this anchor can be tailored to provide zero net change in length at temperatures from room temperature to 4.5K. This anchor scheme is proposed for implementation in SSC dipole and

D. Dates and Places of Inventions: quadrupole magnets (see attachment).

- 1. Conception by Inventor (3*) July 16, 1986 At Fermilab
- 2. First Sketch or Drawing July 16, 1986 At Fermilab In Workbook TN#4 Page 193
- 3. First Written Description July 23, 1986 At Fermilab In Workbook TN#4 Page 195
- 4. Disclosure to Others (4*) July 23, 1986 At Fermilab
- a. _____ 19 At _____
- b. _____ 19 At _____
- 5. Completion of Model or Full Size Device April 1, 1987 At Fermilab
- 6. First Test or Operation of Invention April 1, 1987 At Fermilab

E. Results of Tests and Extent of Use of Invention (5*) Calculations verify performance, testing not completed as of this date.

F. Names of all Persons Having Knowledge of Facts Stated Under D. and E.: R. Lundy, P. Mantsch, N. Engler, etc.

G. Pertinent Reports (6*): FNAL SSC R&D meeting notes 8-1-86 to 12-31-86

H. Other Closely Related Publications, Patents, and Patent Applications (7*): None known

I. Rights of U.S. Government:

J. Licenses or Assignments:

K. Contracts Involved:

Contract No.:

Date:

Contractor and Address

Type of Contract:

Unclassified | Restricted | Confidential | Secret

L. Signature of Witness:

Date:

Signature of Inventor(s):

Date:

X Paul M. Mantsch

Thomas H. Nicol, Ralph C. Niemann, John D. Gonczy

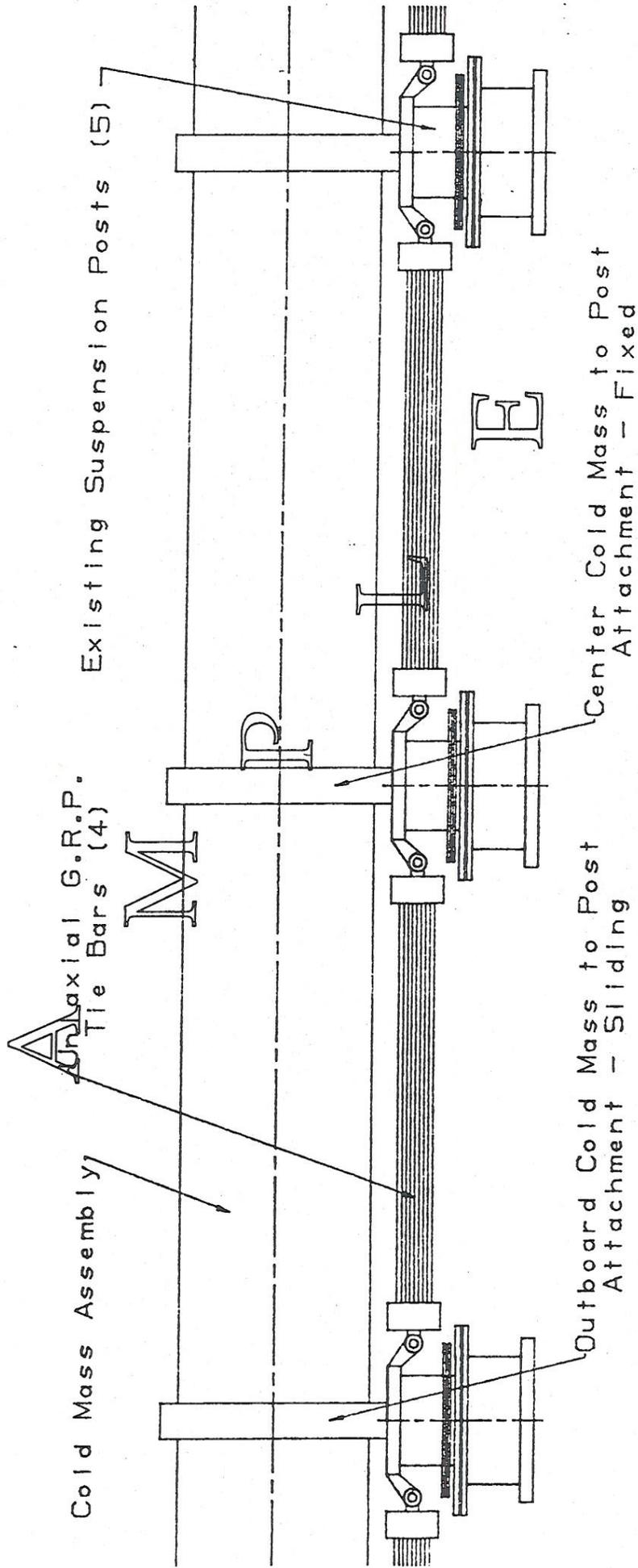
01-23-87

Forwarded by (8*):

Date:

January 23, 1987

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SSC Suspension / Anchor System
(center section only)