

Comments and Communications

Welding Thermocouples

In a recent technical paper (*Science*, March 18, 1949, p. 281) James A. Riley presented "A Simple Method for Welding Thermocouples."

I should like to bring to your attention a description of a similar apparatus invented in Russia by a member of the "Vnidi," Engineer Velixon, for making pyrometers to be used on engine pistons. The usual couples, consisting of copper, constantan, nickel, and nichrome, cannot be used for such purposes because of the high incidence of breakage due to the low elasticity of these materials.

The best couple for measurement of the temperatures of high speed Diesel engines (1500 rpm) has been found

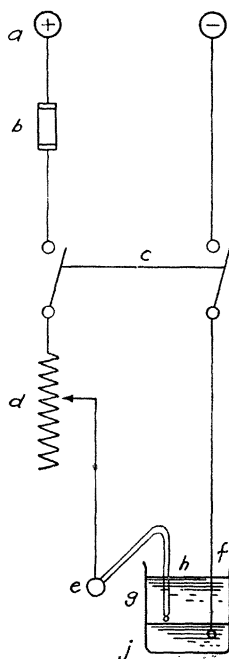


FIG. 1. Velixon apparatus for welding fine wires.

to be annealed steel and constantan. However, welding of the materials is difficult in an ordinary voltaic arc as the steel oxidizes.

Essential features of the Russian apparatus are shown in Fig. 1, and a description of the process (*Diesel-estroyenive*, Nos. 4-5, 1932, p. 38) is as follows:

"One of the poles of the source of current (D.C. is preferable) is connected through fuse *b*, knife-switch *c*, and resistance *d*, to the terminal *e*. The other pole is connected to a wire dipped into vessel *f* containing mercury *j* and oil *g*. To weld the couple, the ends of the wires are twisted into a knot *h*, the free end of one of the wires being connected to terminal *e*. The knot is then dipped into the mercury and rapidly withdrawn.

For an instant an arc is formed between the mercury and the wire knot while the latter passes through the oil, and this arc welds the tips of the wires together. An excellent joint is produced as the process takes place in a complete absence of air. Wire of diameter from 0.05 to 2.0 mm. can be welded by this method."

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International Polar Year of 1932-1933

The Second International or Jubilee Polar Year of 1932-1933 was sponsored by the International Meteorological Organization. That organization had also sponsored the First International Polar Year of 1882-1883, as the result of a suggestion made in 1875 by Lieutenant Karl Weyprecht of Austria. Weyprecht's premise that the scientific worth of polar expeditions would be immeasurably increased were they arranged to follow a uniform program to supply simultaneous physical data at many stations in high latitudes, was more than justified by the 20 or more published volumes on the results during 1882-1883.

Advances in all geophysical sciences since 1883, and especially since 1900, indicated that international pooling of resources in instruments, techniques, and methods would be most desirable for any program of polar expeditions, as for example, a second Polar Year of 1932-1933. The preparation of plans for the effort of 1932-1933 was placed by the International Meteorological Organization in the hands of a special International Polar Year Commission, under the presidency of the late Dr. D. La Cour, director of the Danish Meteorological Institute. Dr. La Cour instituted world-wide cooperation in the subject with the result that some 44 countries undertook to participate in the program. Twenty-two of these countries sent out special expeditions, several of which established new stations outside their own borders. In spite of the world-wide economic depression in the early 1930's the necessary funds were found through governmental appropriations and liberal grants from scientific endowments. The polar network of stations was augmented by special programs at existing geophysical observatories in lower latitudes and thus the Second Polar Year was in the truest sense world-wide.

The realization and accomplishment of the program as an international project is a monument to the enthusiasm and indefatigability of La Cour and to the support generously provided by the Danish Meteorological Institute. In spite of interruptions in investigations arising from World War II and the world's unrest in several years preceding that war, many valuable contributions to polar geophysical knowledge have already been made. But there remains much material not yet fully compiled or discussed and many completed or partially

completed manuscripts awaiting publication. It would be peculiarly unfortunate if the potentialities for increased understanding of polar geophysics resulting from this great project, in which so many nations and men took selfless part at great cost, were not fully harvested.

The International Meteorological Organization therefore appointed in November, 1946 a special committee to consider and report upon steps to be taken to complete reductions, analyses, discussions, and publications of the results of the Second International Polar Year 1932-1933 within a definite time limit. Following the committee's report of recommendations in Washington, D. C., to the Directors' Conference of the International Meteorological Organization on October 8, 1947, the Temporary Commission on the Liquidation of the Polar Year 1932-1933 of six members (J. A. Fleming [U. S.], J. Keränen [Finland], H. Petersen [Denmark], J. M. Stagg [Great Britain], H. U. Sverdrup [Norway], and A. Thomson [Canada]), was established. The responsibilities of this commission were defined as follows:

(1) *Terminal date.*—Terminal date for completion of all compilations, analyses, discussions, and final publications was set as December 31, 1950.

(2) *Duties of temporary commission.*—The temporary commission was authorized to (a) acquire services of scientific men as deemed desirable to effect completion of agenda on or before the terminal date, (b) approve expenditures of available funds or of funds made available from any source for necessary services and costs of publications, (c) set up a suitable central bureau and repository of all records, materials, and publications of the Polar Year 1932-1933, and of funds, and (d) appoint, with the approval of the director of the organization designated to house the central bureau, a part-time or full-time paid executive officer whose duties and responsibilities are to be set by the commission.

(3) *Funds and property.*—The commission is to (a) arrange for funds, other than those already available, and to disburse same and (b) have prepared a complete inventory of all instruments and property of the Polar Year Commission 1932-1933 showing (1) original purchases and (2) present distribution by gift or loan or in storage, as also to have authority to dispose of all in accordance with urgent needs of geophysical organizations for worthy projects contemplated.

(4) *Bibliography.*—The commission is to have prepared a complete bibliography of microfilms and publications and their availability for distribution.

(5) *Historical summary.*—Investigators seeking material and results concerning the First International Polar Year 1882-1883 have been disappointed not to find anywhere a single-volume published summary of the activities and publications of that enterprise, despite the numerous valuable contributions which came directly from the results. It is of first importance therefore that the commission arrange for preparation, publication, and wide distribution of a comprehensive, authoritative historical summary of the Polar Year 1932-1933, and of suitable condensations thereof for publication in leading scientific journals. This summary should include lists of (a) official resolutions relating to the en-

terprise by reference to published sources and by publication of those so far not published, (b) complete lists of organizations taking part and their contributions, and (c) complete lists of stations, personnel, equipment, and programs followed.

(6) *Classification for liquidation of agenda.*—The liquidation of the agenda is to be accomplished under four general allocations, namely: (a) meteorology and allied results; (b) geomagnetism, earth currents, atmospheric electricity and allied results; (c) auroral results; and (d) aerological results.

Early in 1948, with the approval of the Danish Ministry, the central bureau was set up at the Danish Meteorological Institute, and Dr. V. Laursen of that institute was made executive officer under the immediate direction of Director H. Petersen. Permission was also given for the part-time services of Messrs. J. Olsen and J. Egedal of the institute's staff to be available.

Balance of funds available (some \$7,000) was generously supplemented by a final grant of \$12,000 from the Rockefeller Foundation through its Board of Trustees, December 2-3, 1947. Of these funds a considerable amount has already been budgeted for various items in the liquidation. As any unexpended balances on December 31, 1950, must be reverted, it is urgently requested that all persons having Polar Year reductions, analyses, and manuscripts in mind will promptly communicate with the executive officer of the Central Bureau at Copenhagen with estimates of funds needed. There are now only some 15 months before the terminal date set by the directives given the commission.

The accomplishment of the program of the Second International Polar Year 1932-1933 was heroic. It would be a calamity and an injustice to those who gave so generously in funds, effort, and time not to see its work completed in respect to thorough compilation, analysis, discussion, and publication as a whole enterprise. The commission will be glad to hear from anyone who may already have published results (with full bibliographical particulars) or who may have some further research in mind, either partially completed or planned, based on data obtained during the Second International Polar Year. Any work to be undertaken must be completed and published by the terminal date set—December 31, 1950.

The completion of what was in the largest sense a distinctly cooperative and international effort, must insure general coordination of findings and their consideration in the broadest aspects. It will provide almost unlimited sources of observed and reduced data for the benefit of scientific investigations for many years to come in which uniform and world-wide simultaneous material is needed.

TEMPORARY COMMISSION ON LIQUIDATION
OF POLAR YEAR 1932-33

J. A. Fleming, President

Carnegie Institution of Washington

V. Laursen, Executive Officer,

Danish Meteorological Institute, Copenhagen