

Calendar of January*

January 1, 1932



Date of birthday of Anatoly Yakovlevich Ishchenko, a famous scientist, corresponding member of the NAS of Ukraine, Honoured Worker of Science and Technology of Ukraine. He made a significant contribution to the fundamentals of the theory of welding aluminum and magnesium alloys, in particular, concerning the problems of formation of oxide films, crystallization cracks during welding, interaction of the components of alloys with arc plasma, electron and laser beams.

January 2, 2009



Date of death of Daniil Andreevich Dudko, a prominent scientist in the field of welding and materials science, academician of the NAS of Ukraine, Honoured Worker of Science and Technology of Ukraine (1921–2009). He worked at the Electric Welding Institute, made a significant contribution to the research and development of processes of submerged-arc and carbon dioxide welding, electroslag welding, metallurgy, development of plasma-arc and microplasma welding methods and new spraying technologies. At the active participation of D.A. Dudko many developments were introduced in rocket production, electronics and power engineering. He is the author of more than 900 scientific papers.

January 3, 1927

One of the patents of the American Company «Harnischfeger Corporation» on modernization of the excavator was published. Applying modern technologies and welding, in 1935 this company for the first time in the world implemented the project of the first all-welded excavator. A year later, the company introduced the world's first all-welded hoisting crane with a box-type boom.



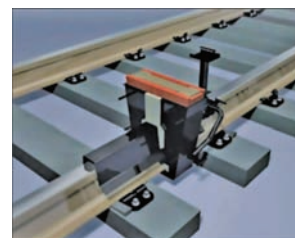
January 4, 2004

The construction of a missile boat of the Project 022 (Houbei class) was started, which is one of a series of 83 Chinese catamarans. This is the world's first missile-armed catamaran. It was designed according to the stealth technology. It is noteworthy that for creation of missile launch facilities, friction stir welding was applied.



January 5, 1935

Wilhelm Alert patented an improved method of thermit welding for railway tracks. In his device he applied a higher temperature, creating a special design which separated a welding zone with a high temperature from the base metal. Alert significantly simplified the system of joining and also used a preheating of the edges to be welded.



January 6, 1933



Date of birthday of David Mikhailovich Kaleko. He developed the scientific fundamentals of the technology of welding ferrous and nonferrous metals with a small section by an arc, burning during a discharge of capacitors, and the means for control of this process. He participated in creation of an installation for spot welding of aluminum alloys, automatic machines for percussion capacitor-type welding of parts of the electronics and radio industry. D.M. Kaleko also developed medical implants and tools of metal with a shape memory effect. He is the author of more than 172 scientific papers, including three monographs.

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January 7, 1935



Date of birthday of Valery Nikolaevich Kubasov (1935–2014), Soviet cosmonaut. On October 16, 1969, on the spacecraft Soyuz-6, the pilot-cosmonauts G.S. Shonin and V.N. Kubasov were the first in the world to perform welding in space. After depressurization of the inhabitant compartment, the cosmonaut-operator V.N. Kubasov, who sat in the descent vehicle, conducted experiments in automatic mode on plasma, electron beam and arc welding using consumable electrode.

January 8, 1910

The use of acetylene welding in the construction of pipelines for water supply was began, namely during the development of a natural water source in the United States. The construction of the three-kilometer pipeline was carried out by Central Colorado Power Co. The pipeline consisted of 200 sections of different diameters. The work took more than a year and a significant amount of carbide and oxygen was spent.



January 9, 1928



Date of birthday of Boris Alekseevich Movchan, an outstanding scientist in the field of materials science of metal and organic materials (amorphous, nanocrystalline, dispersion strengthened, laminated and porous) and protective coatings, as well as in the development and implementation of electron beam technologies and creation of new functional materials. B.A. Movchan is the academician of the NAS of Ukraine, the author of about 360 scientific papers and more than 100 patents for inventions.

January 10, 1972

Ship «Savannah», an experimental civilian vessel with a nuclear power unit, was taken off from the US Navy. It was created to demonstrate a potential for the peaceful use of nuclear energy. It was constructed in the late 1950s in the USA using the technology of arc welding with coated electrodes. The manufacturing process was controlled in detail using X-ray equipment. The vessel was in service since 1962 to 1972. It is one of four ever built merchant ships with a nuclear power unit. In 1981, «Savannah» was transferred to the exposition of the «Patriots Point Naval and Maritime Museum» in Monte Pleasant, South Carolina, USA.



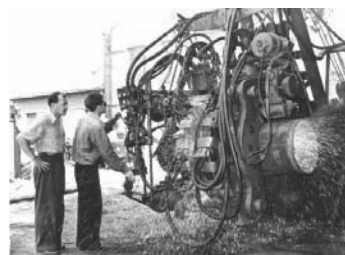
January 11, 1805



Date of death of Fontane Felice (1730–1805), Italian chemist and naturalist. He discovered a water (coke) combustible gas, which is produced from washing of burning hot coal with water and consists of hydrogen and carbon monoxide. Half a century later, this gas was actively used for heating the parts to be welded. In the 1930-1940s, forge welding and «water gas welding» were noted as separate varieties of the production process. In the same years, it was confirmed that the last of these methods can be used to weld sheets with a thickness in the range from 4 to 80 mm using a hammer or roller conveyers.

January 12, 1951

The scientists of Electric Welding Institute (N.G. Ostapenko, V.K. Lebedev, S.I. Kuchuk-Yatsenko, V.A. Sakharnov) for the first time in the world developed the method of flash-butt welding of rails using ring transformers applicable to joining of rails, pipes and other products. Flash-butt welding machines with ring transformers have 10–20 times lower short-circuit impedance in comparison with standard ones.



January 13, 1975

Beginning of Soviet-French Scientific Experiment ARAKS directed on investigation of ionosphere and earth magnetic field. An experiment technology has a lot of common points with the technology of electron beam welding as well as also uses kinetic energy of electrons in electron beam. The experiment is one of the world-known achievements of the PWI.



January 14, 1943

The patent was issued for a technology of tungsten electrode welding in helium to the staff members of Northrup Aircraft Inc. T.R. Piper, V.H. Pavleck and R. Meredith. Earlier at the end of 1941 R. Meredith developed a technology of argon TIG welding using direct current of reversed polarity and then using alternating current from IF transformer with high-frequency add-on.



January 15, 1958

It was an order for US Navy atomic submarine Thresher (SSN-593). Later on it went down in the Atlantic ocean together with all crew. Thresher accompanied by rescue vessel ASR-20 Skylark put to sea for deep submergences. The aim of submergences was check of strength of vessel body at limiting for submarine depths (360 m). Due to the crack in the sea-water line weld an engine compartment of the submarine started to be filled with water. After loss of the submarine the investigation revealed numerous cases of technology violation, application of sub-standard materials and bad quality control of welds.



January 16, 1943

Tanker Schenectady fractured in two when returning to the base after a year of successful marine tests. The crack appeared in a sharp angle of the manhole on a deck, immediately passed through the deck and along the both shipboards until backbone. The message informed: «Schenectady tanker of 7320 t capacity fractured on smooth water at the wall of ship-building plant». Regardless the war, this event received wide publicity in the scientific press and served as a stimulus for development of the researches in the field of welding.



January 17, 1781



Birthday of Robert Hare (1781–1858) — American chemist. He designed a structure of oxygen-hydrogen torch. Works on development of reliable equipment were carried out in parallel with searching a gas composition for welding. First of all it was necessary to design the torch which would provide good mixing of gases with oxygen, high concentration of heat at the nozzle tip and explosion safety. Hare torch proposed in 1802 was one of the first devices deserving attention.

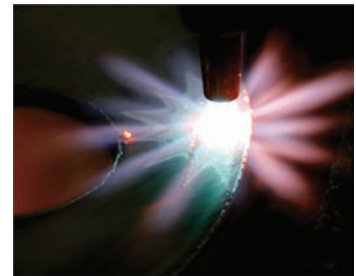
January 18, 1861



Birthday of Johann Wilhelm Goldschmidt (1861–1923) — well-known chemist. He entered the history as inventor of thermit welding method. The process taking place in this method sometimes is called «Goldschmidt reaction» or «Goldschmidt process». In 1898 Johann Goldschmidt for the first time performed thermit welding of two iron bars after their preliminary moulding and filling of the joint place with thermit mixture. After mixture burning the formed liquid pool was so overheated that provoked submelting of the edges and after solidification was transformed into the weld. Slag came to the surface and was easily removed from the place of joining.

January 19, 1833

Birthday of Henry Wilde — British scientist-engineer. In 1860th Henry Wilde welded the edges of wires of relatively large diameter with indirect electric arc applying the theories of Volta and Devy and primitive electric power sources. Henry Wilde was granted with a patent for his invention, which is known believed to be «electric welding patent».



January 20, 1925

A.O. Smith Company registered one of their patents for welding of pipes. Company developed a method of resistance and flash welding and started practical application of the technology in production of longitudinally welded pipes with 5 mm wall thickness and 500 mm diameter, which were welded along the whole length (12 m) using machines of 5000 kV·A. In 1920th the engineers of the company developed a coating for welding rod, which they used in production till 1965 as well as the first method for arc welding of high-pressure pipes.



January 21, 1942

Fabrication of the first tank T-34, shell of which was for the first time welded using automatic welding. The welding technology was developed by the specialists of Electric Welding Institute. Efficiency of automatic welding was 10 times more than that in manual one.



January 22, 1971

Tamara Markovna Slutsкая (PWI) developed self-shielded activated electrode wires for arc welding. Addition of small quantities (5–7 wt.%) of salts of alkali and alkali-earth metals improves arcing stability in welding in CO_2 or its mixtures.

January 23, 1975

Boris Sergeevich Kasatkin, major scientist in the field of welding metallurgy, Corresp. Member of the NAS of Ukraine was awarded the E.O. Paton Prize of the NAS of Ukraine for a series of works on «Heat-hardened low-alloy high-strength steels for welded structures». Production of high-strength steels has been developed and mastered with his personal participation. These steels have been applied with success in manufacture of excavators, road bridges, mine skips, attachments, hydraulic works and other critical constructions. He is author of more than 300 scientific works, including eight monographs.

January 24, 1927

Birthday of Igor Konstantinovich Pokhnodnya, an outstanding scientist in the field of welding, academician of the NAS of Ukraine, Honoured Worker of Science and Technology. He made a significant contribution into the theory of welding processes (melting and transfer of electrode metal, absorption and desorption of gases by molten metal, influence of the electrode coating type on metal melting and transfer in welding). He participated in development of many grades of low-toxic and high-efficient electrodes and flux-cored wires; organized mass production of low-toxic welding consumables in several USSR enterprises. He is author of more than 900 scientific works, including 28 monographs.

January 25, 2004

«Opportunity» rover, delivered by rocket carrier Delta II, landed on Mars. This was the first rocket model, manufactured with application of friction stir welding. Pioneer Company Boeing started experimental application of the new joining method. Owing to its reliability, this method became applied in rocket construction.

**January 26, 1946**

Konstantin Konstantinovich Khrenov, major scientist in the field of welding, academician of the NAS of Ukraine, Honoured Worker of Science and Technology, was awarded the USSR State Prize «For development and introduction of the methods of electric welding and cutting under the water». During the years of World War II the laboratory led by K.K. Khrenov together with specialized teams performed a large scope of work on underwater repair of vessels, destroyed bridges and port facilities. He is author of more than 200 scientific works.

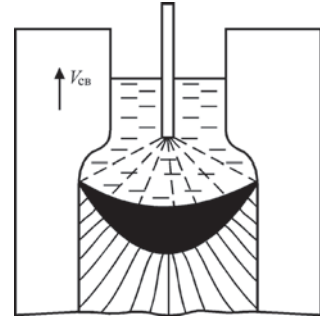
January 27, 1983

The longest undersea tunnel Seikan connecting the Japanese islands of Honshu and Hokkaido, has been completed. Final length of this railway tunnel was 53.9 km, including the underwater part of 23.3 km. The tunnel goes 100 m lower than the seabed level. The rails do not have any bolted butt joints; they are welded into one 54 km long section. This, apparently, is the longest welded railway track in the world.



January 28, 1951

B.E. Paton and G.Z. Voloshkevich (PWI) for the first time created a fundamentally new process of electroslag welding of metals. It is designed for joining items of practically unlimited thickness in one pass. ESW became widely accepted in the USSR and abroad, fundamentally changing the technology of fabrication of thick-walled metal structures.



January 29, 1907



Swedish engineer, Oskar Kelberg, invented coated electrodes for welding and was granted a patent for the invention. His attention was drawn to welders' observation that the weld properties improve in those cases, when the electrodes or zones to be welded, were «stained» with lime, which contaminated the welding sites after making acetylene from calcium carbide. The same effect was produced by contamination, remaining on the wire surface after its drawing, which was conducted with application of lime.

January 30, 1991



John Bardeen, US physicist, died (1908–1991). After the end of World War II John Bardeen joined the Bell Company, where, working together with William Shockley and Walter Brattain, he participated in development of semiconductor devices, which can both rectify and enhance the electric signals. In 1956 Bardeen shared the Nobel Prize with Shockley and Brattain «for semi-conductor studies and discovery of the transistor effect». The transistor is one of the main components of the welding inverter.

January 31, 1964



Vladimir Ivanovich Trufiakov (PWI), known scientist in the field of bridge construction, Corresp.-Memb. of the NAS of Ukraine, Honoured Worker of Science and Technology of Ukraine, proposed and experimentally substantiated application of local explosion as a method of strengthening treatment of joints on large-sized structures. He also significantly developed the concepts of the effect of stress concentration, residual welding stresses, welding defects, frequency and kind of load on metal fatigue resistance. He is author of more than 240 scientific publications, including three monographs.

*The journal Editorial Board will be grateful for additions and clarifications to the Calendar.
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