

AERONAUTICS-ENGINEERING

American Airships Protected From Explosion by Helium

Opinion Grows For Giving Other Countries Protection In Peace Time by Lifting Ban on Helium Exportation

FOR YEARS to come, at least, American airships will be free of the danger of such an accident as that which befell the British R-101.

The Los Angeles, or the new and larger ships now under construction at Akron, may crash, just as a train or automobile may, but the danger of explosion of the highly inflammable hydrogen has been eliminated, because these huge gas bags are filled with helium. Nobody has yet succeeded in making helium combine chemically with another element, and burning is merely a very rapid combining of one element with oxygen.

When the Shenandoah was destroyed in a line squall in Ohio, there was a tragic loss of life, but this was not as great as if hydrogen had been used for the lifting gas. Then there was no explosion and fire of the gas bag, even though the gasoline did burn.

Diesel Engine Possibilities

If the Diesel engine, now commercially used for airplanes and tried on the R-101, can be adapted to the lighter-than-air craft, this danger will be removed and then the airship will be inherently the safest form of aerial vehicle, for fire danger will be almost completely eliminated, and its buoyancy will keep it afloat even if all the power is cut off. Only a severe storm could tear it apart. Even then, as the gas bag is divided into a number of compartments, the pieces would probably float for some time. And by a complete network of radio-equipped weather stations in all parts of the world, such storms can be dodged, just as Dr. Hugo Eckener frequently dodged them in his flights in the Graf Zeppelin.

As far as anyone knows, the United States has the only really practicable supply of the once rare gas, helium. The Helium Division of the Bureau of Mines, of the U. S. Department of Commerce, has control over this supply, and operates several plants for its production. It has been stated that the plants in present operation will supply all the needs of the army and navy for 50 or

60 years to come. In addition there are probably other supplies, at present undeveloped, that could be used if necessary. One supply of helium-bearing natural gas in Utah, has been set aside as a national reserve. The original helium for airships was obtained from the Petrolia fields, in Clay County, Texas. Within the last two years, however, a much larger plant has been placed in operation near Amarillo.

Since helium is considered as a valuable weapon of war, and as it was desired to conserve this, and to prevent any foreign power from accumulating a supply that might possibly be used against us, the law was passed which forbids its exportation. The suggestion has now been made that this law be changed, as a humanitarian measure, and that other nations be sold some.

It is the opinion of Admiral William A. Moffett, chief of the Bureau of Aeronautics of the Navy Department, that the United States is now in a position to supply helium to foreign nations for peace time use in their airships. Dr.

R. B. Moore, dean of the School of Science, Purdue University, and former chief chemist of the U. S. Bureau of Mines also told Science Service that he believes the "ban should be removed in peace time, provided our own airship program is pushed ahead and not restricted, and provided that helium sent abroad to any country should be limited to their immediate peace time needs, and shall not be stored in large quantities for possible use in war."

How Obtained

However, it is thought that our supply is not inexhaustible. The original field, at Petrolia, has now been largely exhausted, and while it is estimated that the Amarillo plant is capable of producing 24 million cubic feet a year, this could probably not be continued indefinitely. Privately owned plants, in Kansas and Colorado, also yield large amounts of the gas.

The natural gas from which it is extracted at Amarillo comes from government owned wells to the northwest of the city, from whence it is piped to the reducing plant. Here the natural gas is cooled to 300 degrees below zero Fahrenheit at which temperature all of the constituents except the helium condense to a liquid and some even freeze to a solid. Then the remaining gas, which is pure helium, is drawn off. The liquid and solid residue is warmed up to ordinary temperatures and it all becomes a gas again.

Science News Letter, October 18, 1930



R-101, SURVIVED BY THREE BIG AIRSHIPS

Two more are under construction and a fifth is contracted for. The largest remaining is the British R-100, which recently made a successful flight to Canada, with 5,000,000 cubic feet capacity. Second is the Graf Zeppelin, of Germany, which has made so many successful flights across oceans, including its famous trip around the world. Its capacity is 3,708,000 cubic feet. The American Los Angeles, which, like the Graf, was built at the Zeppelin works at Friedrichshafen, Germany, is third, with 2,600,000 cubic feet. A new German airship, now under construction, is designated the LZ-128, and will have a capacity of 5,500,000 cubic feet. This is exceeded by the American ZRS-4, being built at Akron, Ohio, on the Zeppelin model, which will have a capacity of 6,500,000 cubic feet. A twin ship to this, the ZRS-5, will be built later at Akron.