

ENGINEERING

Fuel Is Still Scarce

Wartime fuel conservation must continue this winter, even though the war is over. Anthracite burner saves coal by burning little at a time and burning it completely.

By A. C. MONAHAN

► THE WAR is over but the fuel shortage is not. For the coming winter, at least, wartime fuel conservation must continue. Production will not permit unrestricted use. There will be enough coal, oil, wood and gas to keep American homes reasonably comfortable, but pre-war wasteful practices are out for the present, and should, indeed, be out forever.

Reserves of ordinary fuels, it must be remembered, are not inexhaustible. They will probably be needed for many years to heat homes and run industry's machinery. Scientists may some day develop substitutes; they may find satisfactory ways of using atomic energy or the rays of the sun, but for some years the old standby fuels will continue in use.

Many new types of fuel-saving furnaces have been developed during the war years, but few of them have as yet been widely installed. Some will use less fuel in their fire-boxes but will require electric power to operate, the electricity being generated by fuel burned elsewhere. The total saving may be small.

Among these fuel-saving furnaces is an anthracite burner that burns coal five times as fast as the ordinary furnace, but burns very little at a time and burns it completely. Electric power turns an endless screw to push the coal into a six-inch cylindrical combustion chamber and an electrically-driven blower sucks air through the burning coals.

Utilizes Every Bit

A new bituminous coal stove utilizes every bit of combustible matter in the coal, and burns up all smoke and combustible gases created in the first burning that too often go up the chimney. It operates on a unique scientific principle which combines three factors: an adequate supply of air delivered just where needed by means of fan-driven jets, a series of high-temperature refractory flues, and a path for the gases so that all combustible gases are burned up.

An efficient "whirl flame" combustion type of heater, developed for warplanes, will probably be somewhat widely used

in home heating in the future. Its manufacturer is developing a version for home use. It burns a vaporized or atomized gasoline or other liquid fuel in the center of a column of whirling air. Electric power is used to introduce the whirling air column and pressure is required to force the fuel through the atomizer and spray nozzle.

These and other fuel savers will undoubtedly come into wide use in the near future, but few American homes will be so equipped to meet this winter's problem. Better methods of distributing the heat to the rooms of the home, such as the so-called radiant heating, have been developed but they, too, will not be installed early enough to save fuel this season. The furnaces, stoves and distribution of the past decade will continue in full use.

There are many reasons why fuel will not be plentiful during the coming winter. Manpower shortage is one. Many coal miners are still in the armed forces, few new miners have been trained in the past four years and many of the older men will necessarily retire. Coal mining in America is a machine job and only technically trained men are able to operate the mechanical appliances.

Oil will probably not be produced at as high a rate as during the past four years when war needs had to be met. Continuous pumping of most oil wells is not economical. Most of them need rest periods between pumpings. When the oil deep underground close to a well is pumped out, other oil seeps through the sands to replace it. Unless sufficient time is allowed for this seepage, pumps do not work at full capacity.

With the end of the war, certain heavy fuel users will no longer need supplies, it is true. But peacetime factories closed for the war will begin operating again, and many other users of fuel will need quantities far above normal.

Railroads, for instance, are facing heavy problems in meeting conversion conditions and will continue to need vast quantities of fuel. Large numbers of discharged servicemen will return to their homes, and large numbers of former war workers must be transported to

new jobs. Thousands of scattered communities need raw materials so that their factories can produce civilian goods. Lumber and other building materials to repair or erect homes must be transported.

American forces in Germany will not need the large quantity of fuel required by the larger forces during the days of actual fighting but they will need American fuel. Local coal is not available in sufficient quantities for them and for the German civilian population. American occupation forces in Japan will probably require fuel from home, as that country produces little coal or oil.

Because of the disrupted condition of European coal mining resulting from the war, vast quantities of American coal are now being sent to the Netherlands, Belgium and France. The lack of mining equipment, manpower, and transportation in those countries prohibits the production of sufficient fuel to keep the homes of their impoverished people reasonably comfortable.

Gloomy Outlook

Fuel conditions may change rapidly in America, but the present outlook is none too good. Now is the time for the American householder to look forward to the coming winter and its heating problems. This means putting the heating plant in first-class order and the house in condition to retain the heat. It means also learning efficiency in firing a furnace or stove.

The heating plant includes not only the furnace but the smoke pipe and chimney. All three must be clean if good results are to be obtained. If a professional is not available to clean them with modern equipment, including a vacuum cleaner, the householder can do it himself.

To clean the furnace a wire brush and a scraper are needed. All surfaces must be cleared of soot so the metal is clean. The brush and scraper can be used to clean the smoke pipe. The chimney is cleaned with a brick wrapped in rags, and raised and lowered on the end of a stout cord from a position on the roof.

When the surfaces are clean all soot and other materials should be removed from the ashpit, and grates and dampers inspected. If the smoke pipe is burned through a new one should be obtained.

With low-volatile bituminous coal, the conical method of firing is recommended.



GETS MORE HEAT—With the "down-draft burner," being placed into the firing door of a furnace by Prof. Julian R. Fellows of the University of Illinois, soft coal can be burned without smoke, thus getting more heat from the fuel.

The coal is carefully piled in a cone in the center of the fire-box. The larger pieces roll to the walls of the firebox where the air will flow freely through them and make a hot ring of flame next to the heating surface. The finer pieces remain in the center and give off gases that are lighted by the flame from the larger outer pieces.

When high-volatile bituminous is used, the V method of piling is recommended. This means heaping the coal in a sloping pile on one side of the fire-box. This leaves red coals on one side and fresh coal on the other. The top of the fresh coal is quickly lighted by the flame from the other and the gases coming from it are consumed as they pass through the burning layer. On the next firing the fresh coal is put on the opposite side.

Burns Evenly

When burning anthracite in the shovel-feed furnace, the top surface of the coal is kept about on a level with the bottom of the feed door. It burns evenly throughout. Care should be taken not to shake the grates too much. Some ashes should be left on them or the hot coals may warp or burn them. Enough of the ashes must be shaken out to permit air to pass to the burning coals above, otherwise complete combustion will not take place.

The principal loss of heat from a poorly constructed house is through crevices around windows and doors, or under the

eaves, through the glass in the window panes or through spaces between window sashes and frames.

Stuffing the crevices with rags or with some of the commercially available special materials will stop most of the losses through them. Storm windows prevent leakage through the glass itself. Weather stripping on windows and doors closes the spaces between them and their frames.

Science News Letter, November 3, 1945

AERONAUTICS

Restricted Data by NACA To Be Released Now

➤ **WITHHELD** from the public by wartime restrictions, over 300 technical reports and notes on aerodynamics, aircraft structures, power plants and general scientific operation problems will soon be released to technical libraries, schools and to the aircraft industry by the National Advisory Committee for Aeronautics.

The announcement of declassification of these reports was made by Dr. G. W. Lewis, director of aeronautical research of NACA. Covering every problem encountered by aeronautical engineers, these data will be of great value to aeronautical engineering students as well as

to manufacturers. The data were compiled at the NACA laboratories at Langley Field, Va., and its newly announced supersonic research laboratory in Cleveland.

Science News Letter, November 3, 1945

ASTRONOMY

Scientists on Trail Of Brilliant Fireball

➤ **SCIENTISTS** are on the trail of a fireball momentarily of full moon brilliance that flashed across middle eastern United States at about 3 a.m. on the morning of Oct. 21.

Fragmentary reports have been received from the New York and Philadelphia area by Dr. Charles P. Olivier of the Flower Observatory, Upper Darby, Pa., who is president of the American Meteor Society.

This visitor from outer space plunging into the earth's atmosphere was accompanied by bluish flashes as seen by some observers. Those who saw this meteor are asked by Dr. Olivier to send in reports to aid in location of its path and where it exploded.

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