

IT'S TIME FOR YOUR RED FLANNELS!

With Old Man Winter Wetting His Chilly Whistle, Americans Get Ready to Spend \$2,000,000,000 Keeping Warm.



Keeping warm in winter has its problems for the poor fellow in the cartoon, who, like 12,000 other Americans, wears red flannels in the winter. The airlines have their warmth problem licked, for the same mobile unit (left) which pumps cold air into the planes in summer fills them with warm air in winter; after they take off, a steam heating unit goes into operation. Some scientists predict that one day most of our heat will come from the sun via the solar machine, such as Dr. C. G. Abbot, of the Smithsonian Institution, is demonstrating (right).

By WILLIAM C. UTLEY

SHORTS may come and undershirts may go, but with the first twinge of frosty weather there are still 12,000 men in the United States who are walking up to store counters and demanding red flannel underwear, adding one hundred thousand dollars to the \$2,000,000,000 fund which this country spends every year in the business of keeping warm.

Gone, however, are the days when digging ear-muffs out of a trunk in the attic and chopping enough stove wood to fill the back yard constituted the average man's preparations for the winter months. Then he was not troubled with the knowledge that has now come to light through medical research that the temperature of the human body can not drop more than five degrees without causing death in most cases.

"Getting hot"—1937 style—involves not only coal miners and wood choppers, but scientists delving into the mysteries of new kinds of heat, architects poring over blueprints for automatically heated homes, and engineers supervising the operation of huge machines that work with machine-gun rapidity, stamping out the parts for boilers, burners and electric stoves.

In the first place, there is the matter of supplying enough fuel to heat the 12,000,000 homes and 2,000,000 commercial structures that require artificial heat when the mercury slides down towards the freezing point.

\$400,000,000 for Coal.

All during the summer and fall, more than 600,000 men have been working with pick and shovel in mines throughout the country, piling up mountains of coal for protection against the arctic blasts to come.

Coal dealers estimate that between 50 and 60 per cent of the coal bought for heating purposes is shoveled into furnaces during the winter months, bringing the United States' coal bill for this season of the year alone to about \$400,000,000.

In the oil and gas fields of Oklahoma, Texas, California and Pennsylvania, an army of 100,000 laborers is kept busy extracting gas and fuel oil to aid in the business of keeping warm. So rapidly has the heating of houses and buildings with fuel oil and gas increased in the past few years, that it is estimated 35,000,000 barrels of fuel oil will be needed this winter to keep modern furnaces roaring, and the bill will reach the staggering total of more than \$150,000,000.

Shivering house owners will dig down into their pockets for another \$350,000,000 for gas, and additional thousands of dollars for electricity to run the most modern of all heating equipment.

Such tremendous expenditures for fuel were unheard of a generation or two ago, and in fact the modern trend towards automatic heating which is now sweeping the country, and piling up huge fuel and equipment bills, did not begin in earnest until after the World War.

The Two Kinds of Heat.

Almost all the modern improvements in heating equipment which make life not only possible but comfortable in the temperate zone, stem from experiments conducted not by isolated research experts, but by scientists working in the laboratories of one of the country's largest electrical companies that present day Americans are indebted for improvements that have come from the amazing discovery that there are essentially two kinds of heat: radiant and convected.

Convected heat—the kind given off by open fires and hot air furnaces—produces warmth by heating the air. On the other hand, it was found that radiant heat consists of rays which warm the body without necessarily having much effect on the surrounding air.

As the result of this research, and investigations by scientists connected with other industrial concerns, engineers have found the answer to widely-varying problems in heating brought about by changed conditions of modern living. They have conquered the difficulties of installing 65 miles of steam conduits beneath the swarming arteries of traffic in New York to pipe warmth from central heating plants to 2,000 office and residence buildings. On the opposite end of the scale is the successful installation of a separate heating system in a bird house.

Air-Conditioned Bird House.

The steam-heated bird house, probably the only one in existence, is the property of a California woman. In training canaries to sing, she found it most effective to keep them shut up in large outdoor houses, completely insulated against outside noises so that the birds would hear nothing but the sound of phonograph records being played. This brought on the problem of air-conditioning the bird house, and a complete ventilating and steam heating system was installed, with steam heat pipes enclosed in the walls.

Managers of the nation's transcontinental airways, faced with the difficulties of passenger comfort on winter flights, took their problem to heating engineers, who have developed a unique system for warming the huge passenger planes that now roar across the sky trails.

As the result of scientific research and experiments, cross-country planes this winter will be warmed by "flying steam heat," designed to maintain a temperature in the cabins of at least 70 degrees even during the coldest weather. The flying heaters, which weigh only 140 pounds, produce enough steam to heat a five-room house on the ground. Using only eight quarts of water, the miniature boilers are heated by exhaust gases from the engines, and the temperature is regulated either by thermostats, or by controls in the pilot's compartment. Provision is made for a complete change of air in the transport planes every four minutes, so that the atmosphere does not become "stuffy."

Thawing Out Iron Ore.

Before the take-off of each flight, and before the exhaust from the engines has had a chance to start the steam heater in operation, the interiors of the huge planes are warmed by special mobile heating units, maintained at the airports. These units, mounted on small trucks, pump warmed air into the cabins, thus bringing the temperature to the desired level before passengers enter the ship.

Not only is human comfort in the wintertime dependent on scientific developments, but the business life of the nation as well, for industrial schedules must be maintained despite weather conditions. Here again, research experts in one industry came to the rescue of another when engineers of the B. F. Goodrich company solved a stubborn problem at the root of all industry by making it possible to ship iron ore in zero weather from the Great Lakes district.

On the shores of Lake Superior, where snow and ice close in while the big ore boats are still running, carloads of wet iron ore freeze into solid chunks before they can be unloaded. To meet this emergency, the engineers devised a hose of special compounded rubber through

which super-heated steam is pumped into the cars, effectively thawing out the ore so that it can be handled quickly and efficiently and shipped to the steel mills as the "food" to keep industry humming.

While the ravenous demands of the steel mills are being satisfied, heating engineers have also had the problem of keeping food for the dinner tables moving to the markets in winter.

Tropical fruits, for instance, are brought into this country green, and then ripened in specially constructed heating rooms. Bananas are put in rooms to ripen, with the temperature carefully regulated between 56 and 70 degrees. By controlling the temperature of the ripening rooms, marketers can delay or hasten the ripening process and so adjust the supply of bananas to reach consumers in a steady stream. Grapefruit is ripened in specially-heated rooms at a temperature of 75 degrees and "air-conditioned lemons" are kept at a temperature of from 54 to 59 degrees until they are ready to be sold to the public.

Despite the emphasis on heat for food, industries and homes, the business of keeping warm has as one of the most troublesome problems the difficulty of keeping a nation comfortable during the winter, while reducing fire hazards to the lowest possible point. The extent to which this is being accomplished can be easily seen from the fact that while the volume of business increased 34 per cent in the automatic heating industry from 1935 to 1936, fire losses increased only 11.9 per cent.

Fire Losses Decrease.

According to statistics compiled by the authoritative Heating and Ventilating magazine, the volume of business in the automatic heating industry has jumped more than 250 per cent in the past five years. In 1932, it is estimated that the sale of automatic heating equipment amounted to only \$41,711,000. By 1936 this figure had increased to \$108,990,000.

Meanwhile, fire losses in the United States in 1936 totaled \$263,259,746, according to estimates of the National Board of Fire Underwriters, showing a decrease of 34 per cent from the 1932 figure of \$400,859,000.

Nevertheless, there are still enough defective chimneys and flues left in the country so that it is estimated that about \$10,000,000 worth of property will go up in smoke this coming winter, and a similar amount will be lost because of imperfect stoves, furnaces and boilers.

As scientists attack this problem, as well as others, there is a hint that the future might see great changes not only in the type of heaters used, but in the kind of fuel, for recent experiments point to a time when we may get all or most of our heat from the sun.

Dr. C. G. Abbot, head of the Smithsonian Institution, has recently developed a solar heater that is the most efficient yet produced. Utilizing the hot rays of the sun, reflected by a bright metal sheet, he has succeeded in heating a black liquid called aroclor to a temperature at which it can be used for turning water into steam. Experts declare that solar rays available for heat are at least 1,000 times as powerful as the coal, oil and hydro-electric power now used. Although the conversion of sun rays into heat is still too costly to compete with the cheaper and better known fuels, scientists say the day may come when these are all exhausted, and when we will turn to the sun for heat and power, and the business of keeping warm will literally be done with mirrors.

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Floyd Gibbons'

ADVENTURERS' CLUB

HEADLINES FROM THE LIVES OF PEOPLE LIKE YOURSELF!



"Stretching His Luck"

By FLOYD GIBBONS
Famous Headline Hunter

HELLO, EVERYBODY:

Teddy was a wing walker. You know, one of those birds in a flying circus who does things on the wing of a plane you wouldn't try in your own parlor. They must need money mighty bad, you tell your neighbor.

Teddy always was a runt. That's why he was a wing walker. You wanted as little weight as possible moving around out there on the fabric-covered wings of those Jennies the flying circuses were using right after the war. They weren't built for wing walking. But Teddy walked 'em, even in his sleep.

It was old stuff to him. It was so old he began to look around for something new to thrill the gaping crowds. Something that gave them a bigger kick than hanging by your knees from the undercarriage of a speeding plane. He didn't know then it never pays to play the other fellow's game. But he learned.

Well, sir, it was in a town the flying circus was playing out in Iowa that Teddy came across the idea he was looking for. It came to him as he watched a human fly scale the walls of the tallest building. Reaching the topmost story, the fly somehow attached an ordinary inner tube to a window, sunk his teeth in the other end and hung there in the breeze. Teddy saw the stunt "got" the crowd. And it would knock 'em cold when he pulled it on a plane a thousand or so feet in the air.

Human Fly Showed Him the Trick.

When the fly came down to earth, Teddy introduced himself, invited him to supper. Maybe they hoisted a couple. Anyway, the fly warmed up enough to tell Teddy how it worked.

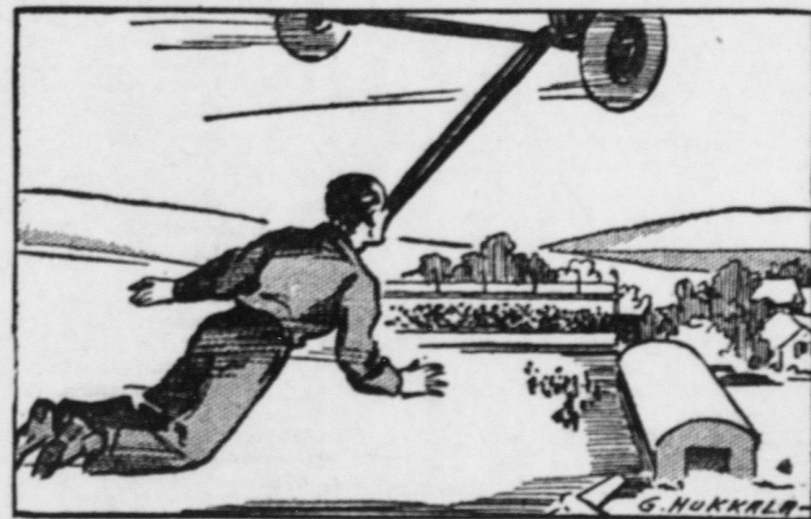
Before he went to bed that night, the wing walker bought himself a couple of brand new inner tubes. The next day, out at the flying field, he rigged them as he had been instructed. High up on a wall he fastened an end of one. Then, climbing on a chair, he took the other end in his teeth and kicked the chair away.

The darn thing stretched so far his feet touched the floor. He moved the tube a couple feet higher and everything was fine.

Day after day Teddy religiously practiced hanging from that tube to strengthen the muscles of his jaws and neck. It was a heavy strain to put on the front upper teeth that were bridgework, but they held. And six weeks later Teddy was prepared to strut his stuff.

Before we go any further I had better tell you Teddy is Theodore Davidson of Galesburg, Ill. They still call him "Dare Devil" Davidson.

He was all of that on a sunny afternoon, in September, 1919, in Moline, Ill., where the flying circus was putting on its show, making those



His Jaws Clamped Down on the Flapping End.

Jennies do things they were never built for. The weather was perfect. So was the gate. And the performers were feeling pretty good as they took to the skies.

Teddy Tried It Out in Moline.

Especially Teddy. He was going to pop their eyes out with a brand new, death-defying stunt, performed for the first time in any land. It never occurred to him then, this would also be the last time.

The inner tube was fastened securely to the axle of the undercarriage of the Jenny. And everything went off according to schedule until Teddy began lowering himself down that wriggling, slippery, flabby length of rubber.

"Right then," Teddy says, "I could see I had stretched my luck too far."

Right there, too, he began learning a painful lesson in simple physics!

He had failed to figure what effect the air resistance of his body would have upon the tubing. Hanging below the plane, moving seventy miles an hour, the drag of the air on Teddy added some thirty or forty pounds to the weight of that big rubber band.

"That tube started stretching and stretching," says Teddy, "and it was like a live thing as I slipped and fought it!"

The more it stretched, the harder it was for a wing walker with a bright idea to hang on. It had never acted that way in practice. Would it hold? Could it hold? What was he going to do about it? Teddy says he was too dumb to climb back. That was probably because he was too busy holding on.

Well, sir, that's one of the darnedest fixes I ever heard of. And it became worse. After rattling for ten minutes with that flexible support his arms tired.

Then His Bridgework Gave Way.

He slipped lower. Finally, he just had to let himself down to where he could sink his teeth into the gadget attached to the flapping end. His jaws clamped down on it. The rest of him was limp with weariness.

His head forced back, he saw the tube stretch alarmingly as gusts of wind put more pressure on his body. There were six feet of it between him and the landing gear.

In practice, it had never stretched to more than three! Teddy tried to relax as the plane circled fifteen hundred feet above the grandstand. His aching arms were folded, resting for that long climb to safety. He wasn't sure he could do it. But he was not permitted to dwell on the idea for long. There was a wrench, a crunch, a shoot of pain in Teddy's face.

The bridgework that was Teddy's front uppers had crushed! The ends of the mouthpiece, however, were tucked away back where they were gripped by molars on both sides. Still gripping it, Teddy began inching his way upward along that thing, twisted, tough tubing that had been put to such strange use. Well, boys and girls, there is no use prolonging the agony.

"I made it, too," Teddy says, "but by such a small margin I decided then and there to be satisfied with my old bag of tricks."

Teddy's story closes on a note of sadness. Those artificial teeth of his vanished into thin air during the minutes he struggled up that yielding rope of rubber. All the dough he made that dizzy day went to buy a new set.

The wing walker says, "I'll never stretch my luck again."

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Battle of Kites

Japanese kites are flown by groups of boys in Japan in competitions, or "kite battles." All sorts of decorative kites are made, light but quite strong, with special lines treated with a ground glass and glue mixture which makes them very sharp. In a battle, the idea is to see who can maneuver his string against the string of another kite, cutting it so that it will fall to the ground. The boy who causes the most kites to fall wins.

Roughness of Great Oceans

The Pacific ocean is less subject to storms than the Atlantic. This is due to various reasons, partly on account of its great extent and partly because there is no wide opening to the Arctic region. The normal wind circulation is on the whole less modified in the North Pacific than in the Atlantic. The trade winds are generally weaker and less persistent in the Pacific, and the intervening belt of equatorial calms is greater.

Ask Me Another

A General Quiz

1. Which is greater, the diameter of the earth from pole to pole, or the diameter between two points on the equator?
2. What is meant by the gentlest art?
3. Who was called the scourge of God?
4. Do United States vessels pay toll when passing through the Panama canal?
5. What is meant by a repeating decimal?
6. Does the United States have a woman ambassador or minister to a foreign government?
7. What are the seven follies of science?
8. How may one change Centigrade temperature into the equivalent Fahrenheit temperature?

Answers

1. The latter, since the earth is slightly flattened at the poles.
2. The term refers to letter writing.
3. Attila, king of the Huns in the Fifth century, so styled himself.
4. No.
5. It is one in which a figure is repeated without end, such as .66666+.
6. Mrs. J. Borden Harriman, the only one, is minister to Norway.
7. The so-called follies of science are the quadrature of the circle, the duplication of the cube, trisection of the angle, perpetual motion, transmutation of metals, fixation of mercury, the elixir of life.
8. Multiply by 9-5 and add 32 to the product. To change Fahrenheit into Centigrade, subtract 32 and multiply the remainder by 5-9.

I'M FEELING FINE THIS MORNING - FREE FROM THAT THROBBING HEADACHE AND READY FOR A GOOD DAY'S WORK.



All people who suffer occasionally from headaches ought to know this way to quick relief. At the first sign of such pain, take two Bayer Aspirin Tablets with a half glass of water. Sometimes if the pain is more severe, a second dose is necessary later, according to directions. If headaches keep coming back we advise you to see your own physician. He will look for the cause in order to correct it. The price now is only 15¢ for twelve tablets or two full dozen for 25 cents—virtually, only a cent apiece.



virtually 1 cent a tablet

Knowledge and Experience Knowledge, like religion, must be experienced in order to be known.—Whipple.

To Women:

If you suffer every month you owe it to yourself to take note of Cardui and find out whether it will benefit you.

Functional pains of menstruation have, in many, many cases, been eased by Cardui. And where malnutrition (poor nourishment) had taken away women's strength, Cardui has been found to increase the appetite, improve digestion and in that way help to build up a natural resistance to certain useless suffering. (Where Cardui fails to benefit, consult a physician.) Ask your druggist for Cardui—(pronounced "Card-u-i").

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