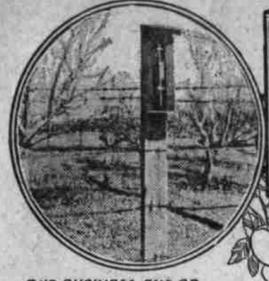
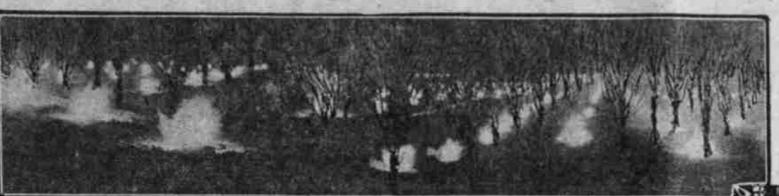


SAVING FRUIT FROM FROST



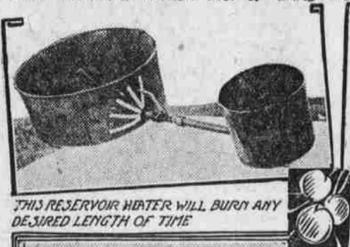
ONE BUSINESS END OF FROST ALARM, THE THERMOMETER



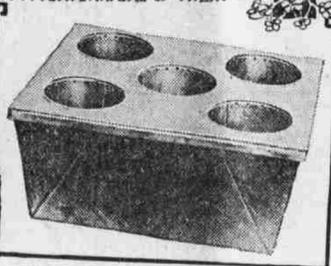
WHEN THE SMUDGE POTS ARE BURNING



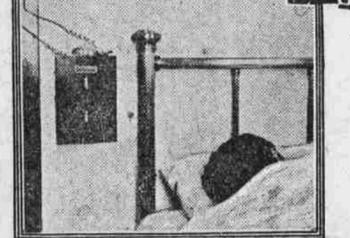
HEATERS WHICH SAVED A CROP OF PEARS FROM A TEMPERATURE OF TWENTY



THIS RESERVOIR HEATER WILL BURN ANY DESIRED LENGTH OF TIME



FAN TYPE OF RESERVOIR HEATER



THE OTHER BUSINESS END OF FROST ALARM

How up-to-date orchardists protect their crops and laugh at the ghost of bankruptcy by using smudge pots to drive away killing cold during the blossoming period

By Robert H. Moulton

WITHIN the last two years another and a greater triumph of scientific horticulture has arrived; another natural enemy of the things that grow and bring forth fruit has been vanquished. Jack Frost, long king of the fruit crop, has been dethroned. Fruit growers have literally built millions of fires under him, and burned him out. Scientific orchard heating has made it possible to raise the temperature of a 200-acre orchard ten to fifteen degrees with as much certainty as the janitor can heat the city man's flat. It takes somewhat more labor than the last mentioned process, but the satisfaction and the profits of "heating all outdoors" are surpassingly greater. Frost insurance for the fruit crop is now just as practicable, just as certain, and vastly more profitable for the money expended than either fire or life insurance. Insurance by fire for the fruit grower makes vastly greater profits at a much smaller expense than insurance against fire does for the merchant or manufacturer. The little outdoor oil stoves and coal furnaces that have been sold by the millions to orchard owners in the last year and a half have banished from the fruit grower that annual early spring nervous prostration from fear of frost; that periodic, paralyzing fear that he will go to bed at night and awaken to find his whole year's labor chilled to death by a sudden frost. The cumulative despair of losing three or four fruit crops in succession that has put fruit growers out of business and made them dependent on charity or day labor is past. An orchard with a reasonably industrious and provident owner can be made to yield an average crop every season so far as the frost is concerned. Scientific frost fighting with fire is as much a fact as seed testing, irrigation, fertilizing, spraying or pruning. It is the last and greatest advance in systematic horticulture, and has placed the fruit grower abreast of the scientific farmer. Since the beginning of commercial horticulture, the fruit grower has been at the mercy of the elements. He made all his calculations, all his plans, all his business arrangements contingent on the hope that the frost would miss him. And before the development of orchard heating the chances against him were getting worse in the frost belt. In the modern, commercial orchard, the land, machinery, labor, spraying equipment and cultivation total as heavy an investment as many manufacturing enterprises. And when two or three crops in succession were wiped out by frost, the average grower was completely bankrupt. Smudging, or the formation of a dense blanket of smoke over the orchard, had been practiced with varying degrees of success in some parts of Europe. Orchard heating proper was first used in California, and the original California smudge pot is still successfully employed in many orchards. In the spring of 1910 several growers in the Grand valley of Colorado experimented with the burning of oil in simple pots of the "lard-pail" type, with the result that they saved their entire crop on the heated areas and lost it on the unheated tracts. The spring of 1911 saw the adoption of the smudge pots on every fruit section of the state, and they reached the experimental stage in several other states. In the spring of 1912 there was not a fruit growing state without them, and many sections of several states were as fully equipped as Colorado. Frost fighting is not an easy job. It is necessary to have a force of men, industrious and careful and observing to the last degree. And it is no pleasant task to rush out into the still, cold darkness to drag the better part of the night to save your own or your neighbor's orchard. In the early days of orchard heating, a man was detailed to watch the tested thermometers that were hung in different parts of the orchard and at the farmhouse some distance away from the fruit trees. If the temperature was not sinking fast, perhaps the rancher went to bed for a brief nap, setting his alarm clock to wake him at intervals through the night. Nowadays he can go to bed with a feeling of security, leaving the frost alarm thermometer to watch for him. This electric watchman has for its business end in the orchard a specially made thermometer, with a fine platinum wire fused into the mercury at the freezing point or at whatever is considered the danger point. As soon as the mercury sinks below this wire, the circuit is broken and the alarm at the head of the orchard boss' bed rings out its warning. Any interruption of the current causes the bell to ring so that if the apparatus should be put out of order it automatically tells on itself. Before the orchardist is usually forewarned, even before he goes to bed, and makes ready for the fray. Late in the afternoon he notices great fleecy

clouds hurrying from the northwest, chased by a bitter wind which seems to have been intended for January, rather than this April night. He goes to the post office for the day's mail and in every window sees the warning of the diligent local government weather forecast: "Freezing temperature tonight." By seven o'clock the government thermometer is at 37 and falling fast. At 7:30 o'clock he telephones the weather man and gets the reply: "Bitter cold all over the country; temperature is already down to thirty-seven in many parts of the valley and will drop to twenty degrees on the western slope of Colorado tonight." By eight o'clock it has fallen to 32, his alarm begins to ring and he knows that King Frost with his icy-fingered warriors is marching on the camp. Steam whistles are beginning to shriek all through the valley to warn the growers of the all-night siege. Farm wagons laden with coal and oil rattle past, giving evidence that the laggards who have been hoping to the last, are beginning to get their heating machinery into action. Already the early ones are firing heavily. Clouds of smoke hang low over the trees, and the little spots of fire beneath punctuate the blackness with rays of hope. The orchard firemen dash for the trees, a torch in one hand, and a gasoline can to aid in quick lighting in the other. Dashing a few drops of gasoline on the oil, they apply the torch, and the blaze is at work. The lighting is done as fast as the men can walk through the orchard, leaving a trail of smoke and fire behind them. In fifteen minutes each man has his tract of orchard transformed into a sea of flame under a cloud of smoke. Then comes the first period of rest. The men gather in the packing house or barn, for lunch or smoke, making occasional trips to the thermometers to see that the fire is doing its work. By 9:30 o'clock the thermometers outside the orchard register 28, and those in the area of heat show a comfortable 37. Then the frost fighters know that the battle is half won, for keeping up the temperature is a good deal easier than raising it when it has once reached the limit. The rest is a matter of vigilance. If the heater is of the regulated type, with enough fuel to burn through the night or longer, a few men are left to watch and open the burners wider if a later sudden fall of temperature shows that more fire is needed. If the heaters are of the uniform single-burner type, they may need to be refilled when they are nearly burned out. If the frost battalion should come back for another charge. The outside thermometers drop to 24, and those in the orchard stand at 30, the danger mark of the orchard frost fighter. The heaters are opened wider, or refilled if burning low, and the mercury shoots up to 33. The slight degrees of frost has been driven away, and if the oil supply is plentiful, and the labor unflagging, the orchardist may now consider the battle won. When the sun has shed his rays over the trees long enough to make the outside temperature more nearly that of the orchard, the heaters are shut off by merely putting on the covers. Heating in the spring of 1912 was much easier than that of the year before; and proved more conclusively than ever the effectiveness of the fires. The crop in the Colorado fruit area for 1911 averaged about 55 per cent. The unheated orchards

yielded from 20 to 75 per cent of a crop, while the yield of the protected orchards was from 95 to 100 per cent, so heavy that thinning was necessary in many of them. Individual testimony to the efficiency of orchard heating in every fruit growing state could be multiplied indefinitely. Fruit crops valued at \$250 to \$750 an acre were frequently saved at a cost of seven to ten dollars an acre. One Colorado grower, for instance, with 50 heaters to the acre raised the temperature of his 40-acre orchard from 18 to 28 degrees and produced 41 carloads of apples. One of the most remarkable stories of heater success comes from Missouri. A 240-acre orchard located in a deep valley had suffered severely from frost every year and had not produced a full crop for 14 years. Against the advice of all wise-ones, two brothers from Kansas City bought it, and equipped it with 5,000 heaters of the controlled or graduated type. With 35 or 40 pots to the acre, the firing was done for four nights at the time the apples were in bloom. They harvested a crop of 15,000 barrels, valued at \$45,000, and it was the only crop in that fruit-growing territory. The net profit on each acre approximated \$200. The first cost of installing an oil-heating plant is higher than for a coal or wood outfit, but the results in time saved and efficiency gained have made it the most popular fuel. Oil can be obtained in quantity at prices ranging from four to seven cents a gallon, and it makes a quick, strong and easily controlled heat. One man can care for from three to five acres of orchard for four or five hours and this is about as long as it will be necessary to burn under ordinary frost conditions. The prices of the oil heaters range from twelve cents for a simple "lard-pail" type to 45 cents for one of the controlled fire-area type, holding three gallons and burning at full capacity for ten or twelve hours, or even longer if regulated for a smaller blaze.

MONKEY FLESH HIS ONLY MEAT.

Too proud to beg, and finding himself on the verge of starvation because of the impoverishment of his noble family in Europe, Count Franz Lazarini, a remittance man well known in Central America, went to a jungle near Managua, Nicaragua, and kept himself alive for five months by eating monkey flesh and roots and berries, according to reports to marine corps headquarters there. A party of United States marines while on a big game hunting expedition discovered the titled foreigner and took him back to the Nicaraguan capital. The count, half starved and nearly mad because of the privation he had suffered, fought his rescuers and begged them to let him remain in the jungle, the reports say. The marines overpowered him, however, and are now attempting to nurse him back to health and reason at their commodious barracks in the American legation.

Tree Stump as Lamp-Post.

In a Pasadena, Cal., front yard there stands an old sycamore stump about ten feet high. Near the top are the stubs of two branches. The owner of the property lately conceived the idea of using the stump for a lamp-post, and in the top at the end of each branch he has placed electric light bulbs, connected with the powerhouse in the usual way. The result has been picturesque in the extreme, especially on a very dark night.

Life's Little Worries.

Life is a tender thing and is easily molested. There is always something that goes amiss. *Vain vexations—vain sometimes, but always vexations. The smallest and slightest impediments are the most piercing; and as little letters most tire the eyes, so do little affairs most disturb us.—Montaigne.

FROM ALL OVER

New Zealand has an annual death rate of less than one per cent. Britain contains 13,000 interned German prisoners. New South Wales, Australia, is expecting a large immigration from the United States after the war. Realizing that bass feed the hot weather, Elford Raymond placed a cake of ice in a rocky cove in Lake Keuka, N. Y., and soon caught eight fine fish.

HAPPENINGS of the week IN MISSOURI

George Noonan, clerk of the court of Washington county, and his wife, his mother-in-law, Mrs. Annie Campbell, and Wade Richardson, 10 years old, of St. Francois county, were drowned the other night in the Bus river, near Blackwell, in St. Francois county. The party attempted to ford the river in a two-horse buggy. Lindell Lester of St. Louis, who was driving, saved himself by swimming.

E. U. Lanekin of Jefferson City has been nominated for state superintendent of schools by the Democratic state committee to fill a vacancy caused by the death of Howard A. Gass.

Jefferson City was selected as the next meeting place at the closing session of the Missouri State Library Association at Columbia. The officers selected for the year are: Ward H. Edwards, Liberty, president; Mary Baker, Columbia, and Frances Jarvis, Parkville, vice-presidents; Harold Wheeler, Rolla, secretary; Miss Margery Quigley, St. Louis, treasurer; O. Severance, Missouri university librarian, and Purd B. Wright were chosen delegates to the American Library Convention.

Boy Scouts officially became members of Joplin's department of public safety recently as a result of their good handling of the huge crowd that greeted Charles Evans Hughes there the other night.

Mrs. Mary A. Cole, 76 years old, is dead at Sedalia. She left two children, Miss Emma Cole, a school teacher there, and a son, Joseph Cole, of Pilot Knob.

Mrs. Charles B. Farris of Jefferson City was elected president of the United Daughters of the Confederacy in their thirteenth annual session at Hannibal. The other officers follow: Mrs. Elliott Spalding, St. Joseph, first vice-president; Mrs. M. Dolan, Hannibal, second vice-president; Mrs. Lester Parker, Jefferson City, corresponding secretary; Miss Ada Potts, Fayette, recording secretary; Mrs. W. W. Pollock, Mexico, registrar; Miss Nellie Burris, Warrensburg, treasurer; Mrs. Blake Woodson, Kansas City, historian; Mrs. C. A. Chenault, Richmond, recorder of crosses.

At the request of the city commissioners the Springfield Traction Company suspended car service at 7 o'clock the other evening on all the lines it has been operating since the car men's strike. The commissioners could give no promise of adequate police protection, saying the police would be needed to control crowds at a political rally and those attracted to the business district on account of it being payday for Frisco employes.

Mrs. J. F. Weaver, wife of the editor of the LaPlata Republican and vice-president of the Farmers and Merchants Bank, is dead in LaPlata.

Fulton is in the throes of a typhoid fever epidemic, all the cases so far being of a mild character. Physicians' reports brought the total to eleven. Among those ill are Prosecuting Attorney Nick Cave.

Judge Thomas F. Ryan, of the criminal court at St. Joseph, announced that Oscar D. McDaniel, indicted on a charge of murdering his wife, would not be suspended as prosecuting attorney pending his trial.

Mrs. Elizabeth Branstetter, mother of Mayor C. K. Shepps of Montgomery, is dead at her home there. She was 73 years old. She had been a resident of Montgomery County for about thirty-five years.

The Rev. Irl R. Hicks, nationally known weather prophet, is dead at his home in Wellston, a suburb of St. Louis, of pneumonia. He was 71 years old.

Mrs. Margaret Harger, a widow, while walking on the back porch of her home at Hume, fell into the cistern and drowned in five feet of water. Her husband, James S. Harger, died a few months ago.

Kenneth Rigg, 17-year-old son of Charles Rigg of Higginsville, was killed by a Chicago & Alton train while watching a battalion of the Seventh Massachusetts infantry entrain.

Clarence Krebs, editor of the Bellflower News, is dead at the age of 39. Knowing that he was fatally ill, Krebs recently sold his paper to J. C. Peroffitt, who has taken control.

Harold Stanley, 15 years old, was instantly killed at Carthage when he attempted to "hop" a moving motor truck and missed his hold, falling under the machine.

The one hundredth birthday anniversary of Mrs. William Brewer was celebrated by herself and her family in Springfield, recently. Mrs. Brewer has good health and is alert mentally. She walks without difficulty about her home.

Jacob Zanz, 58 years old, traveling salesman for the Sedalia Candy company, was found dead in bed at the Terry Hotel there recently. Zanz's home was in St. Louis, where a widow and several children live.

These officers were elected at St. Joseph at the close of the two days' session of the encampment of Missouri Odd Fellows: Grand patriarch, A. T. Hufeland, Louisiana; grand high priest, H. G. Flecher, Liberty; grand senior warden, E. W. 'Ousley, St. James; grand scribe, Ben Wiedle, St. Louis; grand treasurer, H. A. Hamilton, St. Louis.

Melvin N. Bricker, 41 years old, owner of much land near Monroe City, is dead at Bushnell, Ill. Two children and a widow survive.

SOAP IS STRONGLY ALKALINE and constant use will burn out the scalp. Cleanse the scalp by shampooing with "La Creole" Hair Dressing, and darken, in the natural way, those ugly, grizzly hairs. Price, \$1.00.—Adv.

New Fish Bait Declared Good. The United States bureau of fisheries reports that on the last cruise of the Fish Hawk in Chesapeake bay samples of crayfish meat, put up in brine, were distributed among crab fishermen and dealers, to test its value and the possibility of introducing it as a substitute for some of the baits now on the market. Fishermen who have tried the crayfish say that it is a very good bait.

Whenever You Need a General Tonic Take Grove's The Old Standard Grove's Tasteless Chill Tonic is equally valuable as a General Tonic because it contains the well known tonic properties of QUININE and IRON. It acts on the Liver, Drives out Malaria, Enriches the Blood and Builds up the Whole System. 50 cents.

Economy With Caution. "Have you ever studied political economy?" "Some," replied Senator Sorghum; "but when it comes to bustling for votes, I don't believe it being stingy."

THIS IS THE AGE OF YOUTH. You will look ten years younger if you darken your ugly, grizzly, gray hairs by using "La Creole" Hair Dressing.—Adv.

No Place for Jokes. "I see the word 'obey' is to be left out of the marriage ritual." "Yes, the church people evidently thought the ritual was no place for a joke."—Houston Post.

WIFE TOO ILL TO WORK IN BED MOST OF TIME

Her Health Restored by Lydia E. Pinkham's Vegetable Compound.

Indianapolis, Indiana. — "My health was so poor and my constitution so run down that I could not work. I was thin, pale and weak, weighed but 100 pounds and was in bed most of the time. I began taking Lydia E. Pinkham's Vegetable Compound and five months later I weighed 135 pounds. I do all the housework and washing for eleven and I can truthfully say Lydia E. Pinkham's Vegetable Compound has been a godsend to me for I would have been in my grave today but for it. I would tell all women suffering as I was to try your valuable remedy."—Mrs. Wm. Green, 332 S. Addison Street, Indianapolis, Indiana.



There is hardly a neighborhood in this country, wherein some woman has not found health by using this good old-fashioned root and herb remedy. If there is anything about which you would like special advice, write to the Lydia E. Pinkham Medicine Co., Lynn, Mass.

W. L. DOUGLAS

"THE SHOE THAT HOLDS ITS SHAPE"

\$3.00 \$3.50 \$4.00 \$4.50 & \$5.00

Save Money by Wearing W. L. Douglas shoes. For sale by over 9000 shoe dealers. The Best Known Shoes in the World.

W. L. Douglas name and the retail price is stamped on the bottom of all shoes at the factory. The value is guaranteed and the wear protected against high prices for inferior shoes. The retail prices are the same everywhere. They cost no more in San Francisco than they do in New York. They are always worth the price paid for them.

The quality of W. L. Douglas product is guaranteed by more than 40 years experience in making fine shoes. The smart styles are the leaders in the Fashion Centres of America. They are made in a well-equipped factory at Brockton, Mass., by the highest paid, skilled shoemakers, under the direction and supervision of experienced men, all working with an honest determination to make the best shoes for the price that money can buy.

Ask your shoe dealer for W. L. Douglas shoes. If he cannot supply you with the kind you want, take no other make. Write for interesting booklet explaining how to get shoes of the highest standard of quality for the price, by return mail, postage free.

LOOK FOR W. L. Douglas name and the retail price stamped on the bottom.

W. L. Douglas President \$3.00 \$2.50 & \$2.00 W. L. Douglas Shoe Co., Brockton, Mass.

Method in his Madness. "You say Mrs. Naggs was here during my absence?" said the superintendent.

"Yes, sir," was the reply. "She called to see about taking her husband home, but he positively refused to go—said he would rather stay here."

"I always thought there was something wrong about that man," said the superintendent. "He isn't crazy at all."

Then She Called Him a Brute. "Oh, Jack, I expect I shall be awfully stupid now," said the young wife, when she returned from the dentist's.

"How's that?" asked her husband in surprise.

"I've just had my wisdom teeth pulled," she mourned.

"Oh, dear one, the idea that wisdom teeth have anything to do with wisdom is quite absurd," hubby reassured her. "If you had every tooth in your head pulled, it couldn't make you a bit stupider than you are now, you know."

Elusive Stove. "Has the furnace gone out, Bridget?" "It didn't come through here, mum."

Cardui Wins Suit. After a trial in the United States District Court of Chicago, before Judge Carpenter and a federal jury, the jury found the American Medical Association guilty of libeling Cardui, the woman's tonic, which they had denounced as a "nostrum."

This is a vindication of the medicine and a proof that it has merit, which was recognized by a jury after a trial of three months, one of the longest civil cases on record.

Many doctors and chemists testified on both sides and the evidence totaled nearly four million words.

Safety First. Young Cheeky—Sir, I have come to ask for the hand of your daughter in marriage.

Old Gotos—But, my dear sir, she is only a schoolgirl of twelve.

Young Cheeky—Yes, I am aware of that. But I came early to avoid the rush.

The Evening's Embellishments. "Why don't you join our literary club?" "I don't play cards, or dance the modern dances."

Pimples, boils, carbuncles, dry up and disappear with Doctor Pierce's Golden Medical Discovery. In tablets or liquid.—Adv.

The hard tack issued to soldiers is not as hard as the one you discover with your bare foot.

MUCH IN LITTLE

Rust will disappear from steel if soaked in sweet oil for a day, followed with a rubbing with fresh lime. An Englishman has invented a device to enable aviators in flight to pick up messages from the ground by dropping a grape at the end of a line. Russia's cross of St. Andrew has a remarkable peculiarity attaching to it. All who are decorated with it have the right once to demand pardon for a Russian subject condemned to death.

In Norway there is being built a plant that will produce 4,000 tons of aluminum annually. North and South America together produce at present about 78 per cent of the world's copper supply. Holland's mines are now producing coal at a rate of about 2,000,000 tons a year. Argentina's sugar crop for current year reported greatly damaged by adverse weather; sugar exports from the United States to Argentina is the largest in the history of that trade.

Perley G. Candler of Brighton, Me., sold a rooster to a resident at the other end of the village, and carried the fowl in a bag to its new home. The next morning the rooster showed up in its old home, having traced its way across the entire village. Poison lake, so-called, lying near Douglas, Ariz., has been found impregnated with nothing more dangerous than epsom salts, and a company has been formed to extract that medicine from its waters. There are but few wild animals in the neighborhood.

New Zealand has an annual death rate of less than one per cent. Britain contains 13,000 interned German prisoners. New South Wales, Australia, is expecting a large immigration from the United States after the war. Realizing that bass feed the hot weather, Elford Raymond placed a cake of ice in a rocky cove in Lake Keuka, N. Y., and soon caught eight fine fish.

The longest-wearing light weight rubbers you can buy—20,000,000 pairs have absolutely proved it

Ask for GOODRICH STRAIGHT-LINE RUBBER OVERSHOES —not just "rubbers"

Snug as a glove in fit, light on your feet, and stylishly—most in appearance, with "double the wear in every pair" over what other rubbers will give you—there you have the reasons why 38,000 stores recommend "STRAIGHT-LINES" as the best you can buy—and why 20,000,000 pairs of them have been sold on their quality alone.

The Only Boots and Shoes in the World that are made like—and wear like—Goodrich Auto Tires

RED LINE "HIPRESS" WITH THE RED LINE 'ROUND THE TOP

New auto tire tread rubber—tough as nails—in every pair. ONE SOLID PIECE construction, same as Goodrich Tires. Won't leak, or split like others. Give 2 (and 3) times usual wear as 5,000,000 pairs have proved. Try a pair!

The Original BROWN Rubber Boots and Heavy Shoes

The B. F. Goodrich Company, Akron, Ohio

Makes, also, of TEXTAN—the Goodrich Sole that outwears leather on leather shoes