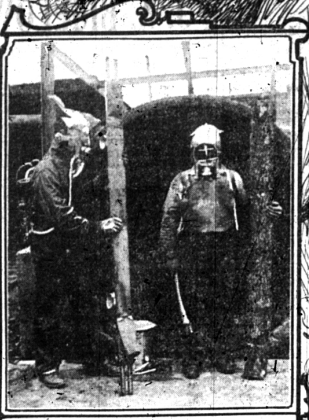


SAFETY OF THE OLD MINERS

HOWARD E. SEXTON



READY TO ENTER MINE

ITS effort to stop the appalling loss of life in the coal mines of the country, the United States government is meeting with much success. For several months an experiment station, under the direction of the technical branch of the United States geological survey, has been in operation at Pittsburg, Pa., with the purpose of discovering the causes of mine disasters and suggesting a remedy.

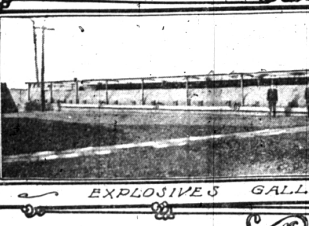
Along with establishment of this station and the agitation which preceded the necessary legislation, there has been a falling off in the number of deaths in the coal mines for the year 1908, and while the official figures have not yet been obtained, it is stated that the number of deaths will be several hundred less than in 1907, which was an unusual year. In December, 1907, four

eries to discover the cause of the explosion by which this dust can be prevented from being a serious menace. To the miners' experiments in wetting it have been added, in some cases, the use of a very definite nature has as yet been learned, unless it is the fact that the dust does not ignite when there is a great amount of moisture in it.

Every effort is being made at the station to come as close to the conditions in a mine as

of improper explosives, as well as the improper use of suitable explosives, results annually in the waste of great amounts of coal. The use of too high charges in blasting, or the use of unsafely violent explosives, shatters much good coal, converting fuel into dust which may itself be explosive and become productive of much further damage. Such explosions often jostle the roof of a coal mine, which may fall later to be wasted, or productive of fatal accidents.

In addition to the actual experiments in testing explosives, important experiments are being made in rescue work up as a miniature coal mine. This is a large glass-encased, airtight room which contains difficult passages such as are found in coal mines. There are also various obstructions similar to what would be found in a mine after it had been wrecked by an explosion; also dummy men, weighing 150 to 200 pounds, representing actual miners. This room is filled with deadly gas and a rescue corps of men who are being trained in the work on a daily basis, and in helmets which supply them with oxygen while they work. The men remain in this chamber for two hours, removing obstructions, picking up the dummies, placing them on stretchers and carrying them away. There is also in the room a machine which records the amount of work a man may be expected to do while wearing one of these helmets. One-half of the large building in which this rescue room is located is used as an auditorium for the instruction of several hundred miners and



EXPLOSIVES GALLERY

explosions took the lives of 700 men, one of them at the Monongah mine in West Virginia—being the greatest mining disaster in the history of this country. There were 256 victims. During 1908, there were but two accidents in which the loss of life was very heavy; one in January at the Hanna mine, in Wyoming, with a loss of 70 men; the other, November 28, at the Marlann mine in Pennsylvania, which resulted in 154 deaths.

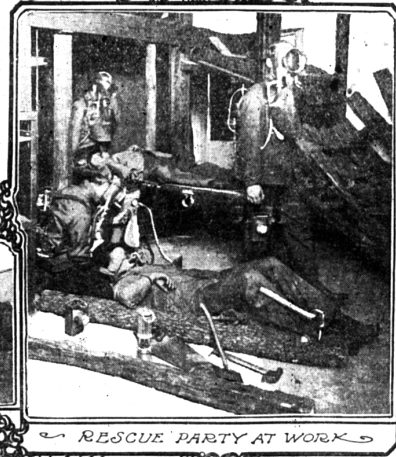
Already at the experiment station two discoveries have been made which will tend to decrease the number of deaths in the mines. It has been demonstrated that a number of the so-called "safety" explosives are anything but safe, in fact the statement is made that with the present explosive used in mining, the miner takes his life in his hand every time he touches of a fuse. It is the purpose of the government to continue these experiments until the explosives of the country are standardized in such a manner that the miner will have a definite idea what these explosives will do.

After the government has gone far enough in its experiments, a bulletin will be issued recommending as permissible explosives such as stand the test. The facts learned concerning these explosives will be valued directly to the attention of the state mining boards as well as the operators.

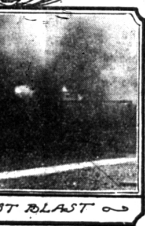
Perhaps the most important and far-reaching experiments so far at the station are those in which it has been definitely shown that coal dust is an explosive equally as dangerous as the deadly fire damp. This has been a mooted question among mining engineers and miners alike, both insisting that it is impossible to explode coal dust unless there is gas present. That the coal dust will explode in the mine where there is no gas has been repeatedly shown to several hundred operators and miners at the testing station. The experts at the station are now bending their en-

possible. The tests of various dynamites and powders used in blasting coal are being made in a mammoth boiler plate cylinder which has previously been filled with gas or coal dust. The cylinder is 100 feet long and six feet in diameter. Safety valves have been placed all along the top and are left unfastened in such a manner that they are left unfastened in such a manner that whenever there is an explosion the valves fly open on their hinges. A series of portholes on the side, covered with one-half inch glass, enables those conducting the experiments to witness the results from an observation house 40 feet away. An explosive mixture of fire damp and air, or coal dust and air, is pumped into the cylinder and the explosive which is to be tested is shot into it from one end of the cylinder, so that the flame goes right into the fire damp or coal dust. Natural gas is used at this station for fire damp, because it corresponds very closely to this deadly gas. The cannon in which the explosives are placed is fired by electricity from the observation house which is parallel with the cylinder itself.

These investigations are expected to accomplish a double purpose; not only a reduction in the number of men killed in the mines, but also a saving of the waste in mining coal. The use



RESCUE PARTY AT WORK



AFTER A COAL DUST BLAST

operators have watched the rescue drill through the large glass windows which separate the auditorium from the gas-filled chamber. Although there has been but little opportunity so far for the rescue corps to demonstrate its efficiency at the mines, still it has done some good work.

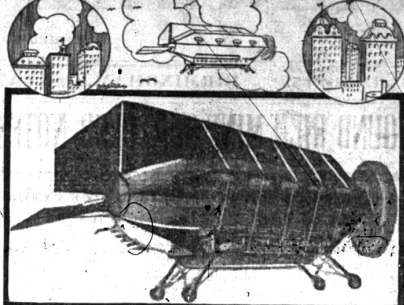
Once the belmated men while fighting a mine fire succeeded in bringing an unconscious man to a place of safety, where he was given oxygen treatment and recovered his senses in a short time.

It is not the intention of the United States government to furnish rescue corps of the country, but to present courses was organized with the idea of encouraging the mine owners and miners themselves to form such organizations. Invitations have been issued to operators throughout the country to send picked men to the experiment station, where they may watch the government rescuers at work and later go through the same training themselves, in order that they may gain the necessary confidence in the use of these helmets. Already a number of the large mining companies have taken advantage of this invitation and are organizing rescue corps at their mines, fully equipped with oxygen helmets.

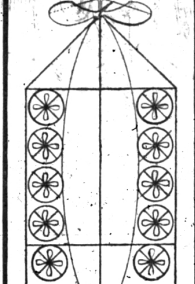
In 1907 more than 3,125 men were killed in the coal mines of the country, a death rate of one for every 1,600 men employed. This is from three to four times as many men per thousand as are killed in any coal-producing country of Europe, where experimental stations such as the one in Pittsburg have been in operation for several years.

Full Beards for Farmers. The protection of farmers and others who are exposed to the heat a great deal is a serious and difficult matter. It is on the increase, and farmers furnish a large proportion of the cases, many of them being due to the direct effects of sunlight on the face and hands. A full beard for the farmer is most desirable for his protection.

AIR LINE ROUTE BETWEEN ST. LOUIS AND NEW YORK CITY



THE PENNINE AIRSHIP



COLLECTIVE DESIGN (BY ROBERT UNWIN) PROPRIETORS OF "HELICOPTERS"

Fact is stranger than fiction. A two million dollar airship is being built for travel between New York city and St. Louis. It is the present year to see a realization of travel between the two cities. This original air liner will sail, according to present plans, between New York and St. Louis. Because of the frequency of travel between the two cities it is probable that the route will run by Chicago. By the air route the time between the two largest cities of the country will be reduced to much less than the present brief time of the limited trains, the two most prominent railway thoroughfares. There will be a saving of time because the route will be more direct, all the meanderings necessitated by rivers, lakes and mountains being eliminated in the untrammelled air.

In addition to this it is predicted that the speed of the airship will be such that it will be able to make the journey in less than the time now required by steam or electric engines.

Railway officials claim that a 14-hour run between Chicago and New York is perfectly feasible. Their claims have been substantiated in actual running. They, then, retaining this record for one or more hours. That is the claim set forth by the inventor and the capitalist backers and the builder of the levitation which is going to power the air, just that the wonderful electric ocean liners push their way through the water.

This proposition is not an idle dream of a novelist. Actual work has already been started on an airship to have a carrying capacity of 1,000 passengers and a speed of 40 miles an hour. It is not necessary to use all the propellers at the same time when going with the wind, and the big craft can partly "coast" in these circumstances, just as an automobile or railway locomotive does when descending a grade.

The buoyancy chamber, as before stated, is to be constructed of steel, and will have many compartments to insure safety in case of puncture.

A. Taylor, a banker, John Chisman and Clarence L. H. White, a real estate owner and builder, George Kennedy, a Boston capitalist, Arthur Scotland of New York, Frank Damon, president of the Bridgeport Realty and Trust Company, of Bridgeport, Ct.; Joseph Howard of Washington, D. C.; J. H. Underwood, a civil engineer of Buenos Ayres, and J. Lamar, president of the Lemaire Construction Company.

Thurston Wood Barnes of New York is credited with the getting together of this group of moneyed men who are willing to take a substantial risk in furtherance of commercializing an idea. The plans of the new vessel have been worked out through a year of experimental years by Edward J. Pennington. As such as 15 years ago Pennington attracted a great deal of attention by his airship inventions.

The airship which Mr. Sexton has undertaken to build is the result of 17 years' study on the part of Mr. Pennington, the inventor. He is generous in acknowledging the indebtedness of Count Zeppelin, whose exploits with his dirigible balloons last year were one of the spectacular developments of aerial navigation, to a wonder-working year. Pennington believes, however, that his own idea of discarding balloons in favor of what he calls a "buoyancy chamber" made of steel will, with his other improvements, render his craft immune from the dangers which are so apt to beset the present day dirigible balloons.

"The great advantage of our ship," says Mr. Pennington, "is that we shall never need to bring her to the ground to refuel her gas. Pure hydrogen gas as a lifting force will be used in the buoyancy chamber, and this gas, properly confined, will last for years without deteriorating, or need renewal."

"That is the real solution of the whole problem, and once our ship is in the air she will float there, out of harm's way, until the wear on her machinery renders her useless."

The plans for this wonderful air liner contemplate a steel-vessel 1,000 feet long over all. The cigar-shaped buoyancy chamber will measure 700 feet from tip to tip and eight feet at its greatest diameter.

The principle upon which the levitation of the air is operated is that upon which all the later dirigibles, including Count Zeppelin's, are constructed. This is the principle of the amplification of gravity.

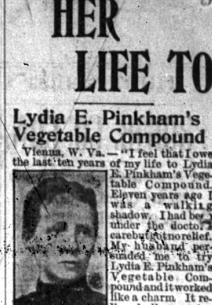
In other words, the ship is given a buoyancy just sufficient to counteract its weight. That is to say, Mr. Pennington's airship, with its buoyancy chamber filled with hydrogen, will, for all its 1,000 feet of steel, weigh almost nothing. Aird it with it with one finger or toss it aloft like a rubber ball.

The ship will be equipped with 11 propellers, five on each side and a larger one, as shown in the picture. In front. The side propellers revolve on a horizontal axis, while the one in front to raise or lower the craft, acting, in the parlance of aeronautics, as "helicopters."

When, however, the ship has reached a proper altitude and it is desired to drive her ahead, the "helicopters," which work on swivel joints, are adjusted to the vertical and propel the ship on her chosen course. Or, similarly, they may be reversed to drive her astern. Two or more or all of the propellers may be used at any time. Eight propellers will drive the ship at an average speed of 20 miles an hour. 11 propellers will send her through the air at 40 miles an hour.

It is not necessary to use all the propellers at the same time when going with the wind, and the big craft can partly "coast" in these circumstances, just as an automobile or railway locomotive does when descending a grade.

THE LIFE TO



Lydia E. Pinkham's Vegetable Compound

Vienna, W. Va. "I feel that I owe the last ten years of my life to Lydia E. Pinkham's Vegetable Compound. I was a walking shadow. I had been under the doctor's carbolic treatment. My husband and I were both suffering from the same complaint. I tried Lydia E. Pinkham's Vegetable Compound and it worked like a charm. It relieved all my pains and misery. I advise all suffering women to take Lydia E. Pinkham's Vegetable Compound."—Miss Emma White, Vienna, W. Va.

Lydia E. Pinkham's Vegetable Compound, made from native roots and herbs, contains no narcotics or harmful drugs, and today holds the record for the largest number of actual cures of female diseases of any similar medicine in the country, and thousands of voluntary testimonials are on file in the Pinkham laboratory at Lynn, Mass., from women who have been cured from almost every form of female complaints, inflammation, ulcers, displacements, fibroid tumors, irregularities, periodic pains, backache, indigestion and nervous prostration. If you would like special advice about your case write to a confidential letter to Mrs. Pinkham, at Lynn, Mass. Her advice is free, and always helpful.

DR. W. H. MAY, 848 Pearl Street, New York City.

There's Danger Ahead

If you've been neglecting a cold. Don't experiment with your health. Get a remedy that you know will cure—that remedy is

DR. D. JAYNE'S EXPECTORANT

It's safe. In the severest cases of coughs, colds, bronchitis, croup, inflammation of the chest and lungs it is the most effective remedy known. It does its work quickly, removes the cause of the disease.

Sold everywhere in this case, bottles, \$1.00, 50c, 25c.

SICK HEADACHE

Positively cured by these Little Pills. They also relieve Rheumatism, Dizziness, Indigestion and Two Hour Headache. A perfect remedy for Diarrhoea, Stomach Troubles, Biliousness, Sick Headache, Colic, Cholera, and all the ailments of the bowels. REFUSE SUBSTITUTES.

"The Last Best West"

The government of Canada now gives to every actual settler 160 acres of wheat-growing land free and an additional 160 acres at \$3.00 an acre. The 300,000 contented American settlers making their homes in Western Canada is the best evidence of the superiority of that country. They are becoming rich, growing from 25 to 50 bushels wheat to the acre; 50 to 100 bushels oats and 45 to 60 bushels barley, besides having splendid herds of cattle raised on the prairie grass. Dairying is an important industry.

The crop of 1909 still keeps Western Canada in the lead. The world will soon look to us as the breadbasket of the world.

Low railway rates, good schools and churches, markets convenient, prices the highest, climate pure and healthy.

Keep It on Hand! Cough and cold cure and any other medicine that you have ever used. It is the best and most reliable. It is the only one that will cure you. It is the only one that will cure you. It is the only one that will cure you.

NO ROYAL ROAD TO EDUCATION

Successful Student Must Be Called Upon to Make Effort. "Do all you can," urged President Eliot in a recent address, "to influence, in each in his own community, the raising of the standard of instruction in high schools." He added, also, private schools. But these do not concern us, nor the public, comments the Boston Herald. We believe with Pres-

ident Eliot that the American people will be likely, in the future as in the past, to value a thing largely by what it costs, not cost in money only, but by what it cost in effort. Education is a result of effort, not of inspiration, and the greater part of the effort must come from the student, whether he be in the grammar school, the high school or the university. It is a mistaken idea that education should be made easy, that mediocrity should set the standard of the courses of the schools, but it is a current idea, and not limited to any city. Authority is too much inclined to provide bargain education. There can be no bargain. There never has been a royal road to education, and there never can be one. But the belief that one exists, and that a smattering of many things is good enough, has served to cover the course with myriads of lives more or less content with superficial views and achievements, and the appearances of things. That is the penalty the public pays for bargain education.

The Realm of the Possible. The realm of the possible was given to man to hope, and not to fear in. If (in sorrow) the thought strikes you that we are punished for crime—mourn for them, and not for the happiness which they have prevented. Rather thank God that he has stopped us in time, and remember his goodness of restoring us to us profit by his chastisement.—Charles Kingsley.