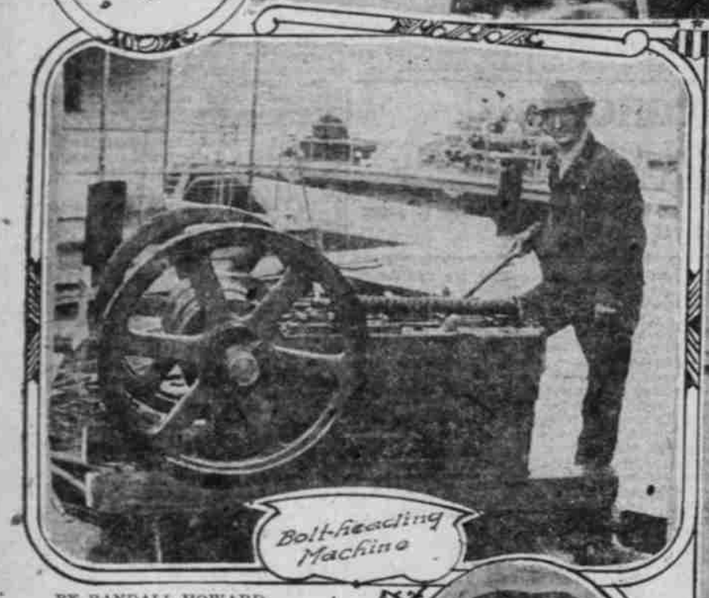
OREGON GENIUS HAS TO HIS CREDIT MORE THAN FORTY INVENTIONS OF GREAT INDUSTRIAL VALUE

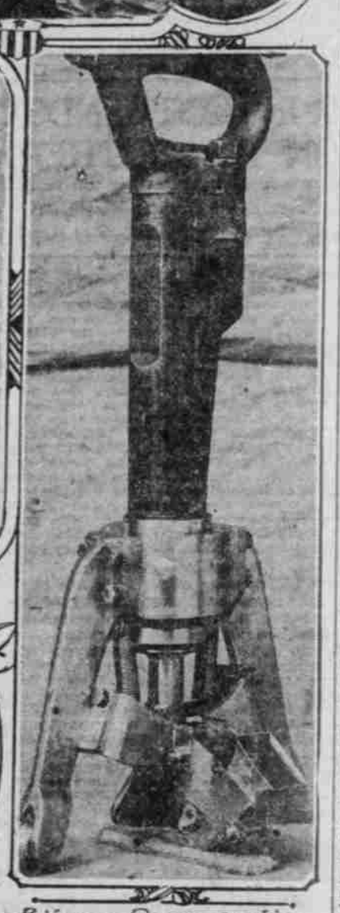
Portland Man Is Honored by Franklin Institute of Philadelphia—Bolt Header and Ship Caulker Are Among the Latest Devices That He Has Originated.

Pneumatic Calking Machine in Use.



Bolt-heading Machine

Thomas Bilyeu, Inventor.



Bilyeu Pneumatic Calking Machine.

BY RANDALL HOWARD.

BORN on an Oregon farm—still in his 30s—with more than 40 domestic and foreign patents already to his credit—the inventor of several machines and labor-saving devices of importance to our world-war emergency—and recently awarded National honor through the bestowal of the "John Scott Legacy" medal by the Franklin Institute of the state of Pennsylvania.

Such is the thumb-nail history of the life and the accomplishments of Thomas Bilyeu.

The inventions of the young Portlander are surprisingly varied. They range from complicated check-protecting and coin-paying devices, to massive machines for the heading of bolts and the automatic framing of mining timbers. One of his inventions is a collapsible shell for the setting of concrete piling; and another is a tiny shorthand typewriter, almost noiseless, supplemented by an elaborate and original system of phonetic spelling.

Industrial Revolution Effected.

One of the earliest of his inventions was his machine for the framing of mining timbers. It may seem an insignificant statement, to say that this machine has been in practical operation for ten years and there are but five of them in use. But not so. These five machines, all in operation in the Columbia River basin, have revolutionized the mining timber framing industry of the West; at least for copper mines.

Ten years ago, it was the common practice to shape the timbers above ground at the mines. Today, practically all these timbers are shaped at the mills by these five automatic timber framing machines.

One must see these automatic framing machines in operation to appreciate their wonderful labor-saving efficiency. The rough squared timber is fed in at one end. The machine takes charge—almost with human ingenuity, it would seem and with much more than human accuracy.

The massive timber is seized, automatically adjusted; then into the parallel saws that shape the ends for morticing. Over, the timber is toppled. More saws; more automatic shifting, and the timber is carried away—still handled automatically—and all in a few seconds time.

Cost Greatly Reduced.

Formerly, the average cost of framing mining timbers was about $2.50 per thousand feet for machine work and about $4 per thousand for hand work. The Bilyeu automatic machine has cut this framing cost down to the almost unbelievable cost of 5 to 10 cents per thousand feet.

To state the matter another way, these five machines, operated by five men, are able to do the work of 500 mine carpenters, not to mention the considerable saving of freight through the shipment of timbers finished for framing.

One of Bilyeu's latest inventions is a bolt-heading machine. Possibly this device might better be classified as a war-emergency achievement. The machine originated in a visit to a large ship building yard. One of the managers complained of his inability to get a machine for the heading of bolts. His ships were threatened with delay. The Eastern manufacturers would not guarantee the delivery of a bolt-heading machine in less than four to six months—which probably would mean from eight months to a year.

Emergency Quickly Met.

So young Bilyeu set to work to design something to meet the emergency. In eight days the working drawings were finished. The machine itself—but for the development of a serious flaw in a 3500-pound casting—would have been completed for emergency use within a period of 30 days.

A like story could be told of another of his late inventions—a contrivance operated by compressed air, for the calking of wooden hulls.

Calking is one of the large items of cost in shipbuilding. Into every crack in the vessel, outside and inside, the decks included, tarred oakum must be pounded. It is a slow process, and ship calkers are often hard to procure. In accordance with the old process, the calker spends one hour of his high-salaried time each half day in "spinning" his oakum from the bale into a rope. The remaining three hours each half day he follows along, monotonously pounding the tarred sisal rope into the crack—exactly the same as his father and his father's father did before him.

Device Speeds Up Calking.

Bilyeu's idea was to speed up—by means of compressed air—the measured and deliberate blows of the old-time calker. And in his completed calking machine, the educated little finger of the calker is displaced by a metal "little finger," which feeds the oakum into the crack at the required rate of speed.

While his pneumatic calking machine is still in the final process of development, there is every reason for believing that it will prove entirely practical, resulting in a large saving of labor.

Another of the earlier Bilyeu inventions is a device for the setting of concrete piles. The original idea was stimulated by an observation—the setting of concrete piles by the driving of a shell into the ground, and leaving the shell.

"Why not remove the shell, and save this item of cost?" Bilyeu asked himself. He therefore invented a shell which might be driven into the ground, and then removed, by means of first lifting out the central core.

This device has been put to practical use in the construction of concrete building foundations and retaining-walls in a number of the larger cities of the Coast, in the building of bridges and in the building of one of the most notable concrete piers of the world, at Houston, Tex.

Money Machine Wins Medal.

It was for his inventions embodied in the international money machine that Bilyeu has just been awarded—at Philadelphia on December 19—the "John Scott Legacy" medal, by the Franklin Institute of the state of Pennsylvania. This machine is a complicated device, with hundreds of separate working parts. It combines an adding machine, a payroll scheduling machine and a coin-ejecting device.

The prize award was made after a careful investigation. The Franklin Institute exists, according to its own motto, "for the promotion of the mechanic arts." The institute is described by the International Encyclopedia as "a learned institution." It was established in 1824; and it is meant to be a clearing-house of information relating to the world of arts and sciences.

The Franklin Institute has, since its foundation, conducted specialized schools in technical training. It has accumulated one of the most notable scientific libraries in the world. It has gathered valuable patent records from many foreign countries. It has issued, consecutively for more than 90 years, a monthly scientific journal. It has been sponsor for many scientific exhibitions, and for many distinctive lectures on scientific subjects. And it has awarded many medals for notable scientific and mechanical achievements.

$4000 Legacy Principal.

The "John Scott Legacy" medal itself traces back to an Edinburgh chemist, who in 1816 bequeathed the sum of $4000 in interest-bearing securities to the corporation of the city of Philadelphia. It was provided that this income should be used, through the distribution of premiums, for the encouragement of "ingenious men and women who make useful inventions."

Beginning in 1834 the award of this medal was intrusted to the Franklin Institute. In 1845 the common council of the city of Philadelphia passed a definite ordinance, which provided that these premiums shall be distributed "only to such persons as the Franklin Institute shall report as being the authors of useful inventions."

This investigation of the Franklin Institute of the merits of different inventions is now in the hands of an elective committee of 60 persons. This committee, in fact, has been one of the chief agencies through which the Franklin Institute has achieved its notable reputation as a scientific society.

Following the committee's investigations of the Bilyeu coin-paying device its decision was advertised for three successive months and objections invited before the final awarding of the "John Scott Legacy" medal.

Check Protector Versatile.

In the same general field as the coin-paying device, Bilyeu has invented a series of four check-protecting machines. The original idea for these was gained on a visit to his office of an agent selling "the best check protector ever made." Bilyeu was not wholly convinced, for the claim was disputed by a picture in his own mind.

The final result was a series of four check protectors. The most elaborate of these is a complete "check writer typewriter," as he calls it. Instead of the usual double operation of writing the check and then adding a not-more-than-such-an-amount" stamp, the Bilyeu checkwriter typewriter is designed to do everything—write the date, number, name and to spell out the amount, both in "protected" words and numerals.

Another of the Bilyeu inventions is a "stenotype" machine. It takes the form of a tiny typewriter. The machine is very light and almost noiseless. In a single stroke it will write anything from a single letter to a complete sentence.

But the mechanism of the machine is only the lesser half of the invention. The greater half relates to the series of very modern gymnastic stunts to which the inventor would subject the English language.

Language Carefully Studied.

As a preliminary, with the aid of an office full of girls and adding machines, he literally dissected all the words in an English dictionary. From this he gained absolute information as to the relative frequency of the use of all the letters of the alphabet, and the relative frequency of the occurence of all possible letter combinations.

With this original information in hand he set to work to devise the most speedy possible scientific keyboard for the phonetic spelling of all the ordinary words of our language. The result is a new scientific system of shorthand writing, and a noiseless little typewriter, with only 21 keys for the recording of stenographic dictation.

Recently Mr. Bilyeu was tendered a commission as Captain, Department of Engineers, United States Army. But from other Government sources he was encouraged rather to give his time toward helping to meet war emergencies relating to Columbia River shipbuilding. The bolt heading machine and the calking machine were the immediate results.

At present he is president of a corporation devoting itself to the work of aiding in the equipment of the wooden hulls that are in the process of building on the Columbia River.

Can of Milk at Front Makes ex-Portland Boy Homesick.

E. L. Houston, With Canadian Army, Writes of Interesting Incident That Recalls Days in Oregon.

THE sight of a can of Oregon milk reposing in a Canadian army cookhouse, located within easy range of the big German guns on the western war front, had the weird effect of making E. L. Houston, former Portland boy now with the overseas force, homesick.

Perhaps it is just as well to let the reader discover, by reading extracts from a letter written by the ex-Portlander and made public by recruiting officers of the British station in Portland, the secret accounting for Mr. Houston's homesickness. Portions of his letter follow:

"As I sit here in an old German dugout I am taking the opportunity of writing this note. It is surely sarcasm on 'Fritz' that he should have constructed such elaborate and comfortable cover for protection of his enemy. We have electric lights here. The contents are a good heater stove, two beds, a table and two chairs, which have been taken from a neighboring French house. The woodwork finish generally, including floor, shelves, cupboards, etc., is very well constructed. One can see that he intended to make a home for himself here.

"I have been over five months in France and Belgium, and am thankful that I have come thus far safe and sound. You would see that we were recently engaged in the operations at Passchendaile Ridge. We were denied the glory of making an advance, our part being to follow up and hold the ground won, which we did on two occasions. This, many will tell you, is the harder task.

"I need not begin to describe conditions in that battle-torn region. I am sorry to say we lost a number of our platoon, including my orderly. Three of our officers were killed and others wounded.

"Can you blame me if I almost got homesick the other day on account of the following incident? The day before we went up to Passchendaile I was sent from our advanced camp, three miles east of the ruins of a famous old Flemish town that will be prominent in Canadian history, to look over the position for our company. Returning late in the afternoon, covered with mud and dead tired, I deposited myself on a board at the cookhouse and asked for a cup of tea. The situation was somewhat depressing—we were bivouaced in mud, our guns on all sides were booming, and Hun Gothas, with their accompanying planes, were dropping deadly bombs around. I reached forward for the milk tin and behold! My eye caught the wording of the label, 'Packed for Balfour, Guthrie & Company, Portland, Oregon.'

Now, to place the connecting link in the little episode, it is necessary only to add that Mr. Houston, while in Portland, was employed by Balfour, Guthrie & Company.

Portland Boy at Isthmus Welcomes Home Paper.

Samuel Groff Writes an Expression of His Pleasure at Finding The Oregonian in Canal Zone.

RECENTLY The Oregonian received a letter from Samuel Burton Groff, who is at the United States submarine base in the Canal Zone. He said:

"The last time I wrote you I was in the training station at Mare Island, California. About the first newspaper I saw upon reaching the Isthmus was the old reliable Oregonian. No matter where I have been, The Oregonian has proved the means of making many a friendship for me.

"We have several Portland boys here and we very naturally stick up for Portland. Lengthy arguments are started every evening over the relative cities. One young sailor, who names 'New Yawk' as his home port, declares it is the best city in the world, and talks lovingly of 'Thoid' avenue. He talks like the comic section of 'Happy Hooligan.' Every man has his choice here, but we all agree that Portland is the mecca of the Pacific Coast."

"One finds that Panama is not such a bad place, but that it is distinctly tropical and not to be compared with the Northwest. It does, however, go Portland one better on the rainy season, for it rains here twice a year, six months at a time.

"We can obtain cocoanuts by climbing the trees, and we can also buy ice cream in pint boxes. The only trouble with our location is the scarcity of mail—it takes two weeks for mail to go one way."

Jailbreaker Is Arrested.

TEKAMAH, Neb., Dec. 28.—With feet frostbitten and showing other traces of recent exposure to the weather, Byron Faulk, who sawed his way from the county jail at Tekamah, was arrested at the home of relatives in Council Bluffs. Bareheaded and in his stocking feet, Faulk beat his way from Tekamah to Blair, Neb., on a freight train. At Blair he procured a pair of shoes and continued his journey to the Bluffs. He says he does not know the whereabouts of his confederate.

CONGRESSIONAL WAR COMMITTEE TELLS OF CONDITIONS ON BATTLE FRONTS IN FRANCE

Representatives Say Women of France Have Been Judged Improperly, and, Instead of Being Frivolous Class, Are Earnestly Engaged in Helping to Win the Great War.

Party of American Congressmen in Front of Hotel Crillon, Palace de la Concorde, Near the Strassburg Monument.

Sterling Heilig, Paris Correspondent, and Representative Dill, of Washington, Examining First American Shell Fired Across Line.

WASHINGTON, D. C., Dec. 22.—Congress is getting first-hand information these days about the European war from the Representatives who spent several weeks of the recent recess along the firing lines. They are Dill, Johnson and Miller, of Washington; Hicks, of New York; Parker, of New Jersey; Goodwin, of Arkansas; Taylor and Timberlake, of Colorado; Dale, of Vermont, and Stephens, of Nebraska. Tom Stout, of Montana, who used to be a Congressman before it became fashionable for Montana to send women to Congress, also went along.

The party spent several weeks in the war zone, during which it was shown every courtesy by the representatives of the allied governments. It was not an official party in any sense, but rather a reporting squad. It was made plain to all of the governments; nevertheless, no effort was spared by our allies across the sea to make the legislators comfortable and give them every advantage for studying the situation.

Out of all the information gleaned—and there was a mass of it—this fact is apparent: The representatives are convinced that this war will be a long one and that there is nothing for the United States to do but fight it out on the present lines if it takes a score of Summers. Representative Dill, chairman of the party, who was one of the Representatives that voted against a declaration of war against Germany, has well expressed the views of all the members in a statement he prepared especially for this newspaper. He has no excuse to offer for his vote on the war, in the light of the manner in which he viewed the situation when he cast that vote, but today he is all for fighting on to the bitter end.

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"The outstanding fact about this war is its bigness," Mr. Dill said. "Everything on the French, English and Belgian fronts makes that impression. If America is to turn the tide, and that is the real part she must play in this struggle, we must throw our whole weight into the fight. We must send not a few hundred thousands of men and a few hundred million dollars, but millions of men and billions of dollars.

"It makes no difference what opinion any American may have had as to the advisability or wisdom of entering the war. The fact is, we are in it and the only way any individual American can really make himself felt is to swell the mass of those who are pressing forward to victory. The diabolical outrages of Germany in France and Belgium will shock the world for centuries. After traveling over some of those areas and seeing a small part of what they have done, I am more convinced than ever of the necessity of forever wiping out the military system that has been responsible for it all.

"Her violation of every rule of warfare has made necessary the 'no quarter' attitude on the part of the soldiers now fighting the Huns. I talked with large numbers of private soldiers in the French, English and Canadian armies, and know that never in the history of war has it been necessary for fighting men to face such a foe as the Germans have proved themselves to be. Only through our wholehearted and complete participation with our every resource can this abominable system be overwhelmed. Everything I saw and heard, in fact, confirms this conviction."

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It is utterly impossible for anyone who has not been on the battlefields to grasp the magnitude of the area over which fighting is taking place, all members of the party declare. Roughly estimated, the battlefront is more than 475 miles long, and along a stretch of more than 40 miles there is almost continuous fighting.

The kingdom of Belgium today consists of a small strip of land, 20 by seven miles. King Albert remains on it, and the hope is that he may never have to leave.

Out of this small seedling, however, may grow another great republic. From conversations members of the party had with King Albert, they became convinced that he plans to form a new government, probably along the lines of that of the United States. He asked particularly about woman suffrage in this country, leading to the belief that the Belgian women may have the vote soon after peace is established. King Albert, it is declared, will be the first president of the republic or Belgium, if such a government ever is established.

Should the Belgians recover all of their lost land it will take many years to restore it to its former fruitful shape. It is criss-crossed, Mr. Johnson declared, with more trenches than it seems possible for humans to make, and much of it has been flooded. This land and all the other land off of which the Germans have been driven, every member of the party confirms, is stripped of vegetation.

Representative Dill pays a high tribute to the women of France. They have been judged improperly by many persons in this country, he insists. Instead of being frivolous and gay, as it is generally believed in this country, they are very earnestly engaged in helping win the war. They are fighting in their own way, doing work behind the battle lines, such as watching crossings and running streetcars.

"All France is in mourning," Representative Dill said. "In all of the hundreds of miles that we traveled through that sorrowful and desolate country we never saw a man smile. Neither did we see any young men. I asked a Frenchman why it was and he replied:

"'There are young men, all right, but three years of war makes a man of 20 look 30 and a man of 30 look 40.'"

Mr. Dill expressed the opinion that the women of France will demand and get the vote when the war is over. But they are not thinking of the vote now; they are winning the country's battles first and are content to let the future of the vote rest.

Members of the party spoke little French and, as a result, some amusing incidents took place. Most of the grief fell on Dill, who, as chairman, was forced to make the introductions.

Upon arrival in France, after an all-night ride in motor cars, the party went to a hotel for something to eat. If they did not order some particular thing they knew they would receive only the regular continental breakfast of hot milk, coffee and bread. So they began to fight the menu, all of which was written in French.

Finally Albert Johnson, who knew one word of French—"omelette"—ordered himself an omelette. So did the 10 or 11 other members of the party. After that Johnson resorted to pointing at things on the menu, but the others took no chances. Johnson vows that he saw one representative eat omelets at eevry meal for ten days.

England is having more trouble with her food supply than France, it is declared, but conditions on the island might be much worse than they are. Johnson tells of giving a dinner to three friends in London at prices which compare very favorably with those charged at leading American hotels. A grouse, with French fried potatoes on the side, for instance, sells for 95 cents, cheaper than it could be bought in this country. Vegetables are comparatively cheap.

England is suffering from high prices charged her by neutral countries for food. She must buy from Holland particularly or supplies from there will go into Germany. There is no white bread, but the British soldiers get it daily from ovens at Calais. There is no extra charge for bread in England. Sugar is very scarce, a third of a loaf of ordinary sugar being served with a cup of coffee.

Merchants who try the combination purchase plan, which recently has been forced on the American public in many cities, are being fined heavily, some of them as much as $600 for each offense.

French hotel prices are fairly reasonable. The hotel at which the party stopped in Paris is manned by injured men back from the front.

Two dinners given the American representatives stand out in their memories. At the dinner given the party by King Albert Representative Stephens of Nebraska assured the Belgians that the United States would remain in the war until Belgiaum was avenged, and it greatly moved the diners. A Belgian General rushed around the table and kissed Stephens on both cheeks. One night the French cabinet gave a dinner and reception to the party, and the Americans awoke the next day to find that the cabinet had been ousted. The presence of the Americans had nothing to do with the said ousting, it is affirmed.

The Congressmen long will remember the day they were under fire. They had such a narrow escape that they still shiver when they think of it.

The party's darting across open spaces between trenches probably tipped off its presence; or it may have been that circling aeroplanes sighted it. Anyhow, soon after the representatives got into the trenches the Germans opened up a terrific machine gun and rifle fire.

Representative Timberlake of Colorado, who stands well over six feet in height, has particular reason to recall that firing. The trenches are less than six feet deep, so he had to fall to his knees to escape the bullets. Representative Johnson and Representative Miller were peeping out over the top of a trench from behind a strip of burlap when the machine guns got busy. They hastily dropped their sightseeing.

How a large shell was heard approaching is told by Representative Johnson and substantiated by other members of the party. Johnson and Dill were walking along well to the rear of the trenches when they heard a great noise behind them.

"What is it?" Dill asked.

"It sounds to me like an aeroplane getting under way," Johnson said.

A few seconds later a tremendous shell fell with a terrific report a short distance from the Congressional party.

Aeroplane fighting is described as giving a person on the ground much the same sensation as watching ducks fired upon. The party saw six allied aeroplanes under fire, at a height of from 12,000 to 15,000 feet, from the German anti-aircraft guns. The range-finding ability is described as marvelous.

On another occasion members of the party saw one of the allied "sausage" balloons dropped. A German aviator hidden behind a cloud, flew across the space between the trenches and dropped the "sausage" with a few well-directed shots. He also escaped.

Americans, by virtue of their big tips, are getting everything they want in France. Before the advent of the American troops tips ranged from a centime, about a penny, up. The American soldier tips nothing less than a franc, now worth about 15 cents. He can afford to, however, as he gets a dollar a day in pay, while the Englishman get only about a quarter and the poor Frenchman much less than that.

This statement must not be taken to indicate, however, that the soldier boys are leading a wild life in France. They are having a good time, but their health and morals are being looked after properly.

"The Y. M. C. A. is doing great work," Representative Dill said. "Every dollar invested with this organization is well invested."

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Insofar as members of the party could learn, nothing regarding the state of health or activities of the troops is being held back from the folks at home. German propagandists are probably responsible for the stories of death, disease and dissatisfaction among the troops.

"Insofar as we could see," Representative Johnson says, "nothing except the greatest military secrets were held back from us. We were taken virtually every place and shown everything.

"If there are any complaints from the boys it is over their not receiving enough letters and having to smoke the terrible French tobacco. I can sympathize with them in the latter case. I smoked some cigars, at 15 cents each, regular doses of which would kill a galley slave. Occasionally, in self-defense, I was forced to pay 50 cents for a good Havana cigar.

"The boys want to hear from home. They asked me to investigate the cause of their not receiving more mail. I have done so, and I find that virtually all mail that is dropped into postoffices in this country is delivered to France. That which is not delivered usually is faultily addressed.

"The morale of our troops is fine. They are getting everything with which a great country can supply them."

All of the Congressmen are high in their praises of both the French and British troops. The story that England has not been sending her own men into fight, but leaving that to men from her colonies, is absolutely untrue, it is declared. Seventy-five per cent of the killed and wounded British soldiers come from England, Mr. Johnson says. Great Britain now holds 275 miles of the battle lines, Belgium 30 miles and the rest is held by France. England has transported 13,000,000 men back and forth across the channel with a total loss on ships of only 3500.

Some idea of the terrific fighting can be gained by the statement that at Verdun the Germans lost 800,000 men and the French 600,000. Of these only 10,000 were buried. Pieces of bodies bits of cloth and other fragments of what have been soldiers still are mired in the field.

In order to clear a certain space three miles deep and five miles long, the French in a recent encounter, the Congressmen were told, shot away $100,000,000 worth of ammunition. They cleared the space.

That the trenches where the first American troops were put in a segment containing probably 40 men might be cleared, the Germans turned 64 guns on it. After firing at the front trench for a while, they raised their fire and sent 250 men over the top and into the trench. They took it, killing three Americans and injuring and capturing others.

Automobile owners may get joy from the prediction of various members of the party that there soon will be an unprecedented demand for gasoline. It now is selling for $1 a gallon in London and $1.50 a gallon in Paris. Coal is $60 a ton and wood $50 a cord in Paris.

Speaking of the distance between enemy trenches, Representative Johnson said it was "as far as from home plate to second base, and," he added, "that is not far."