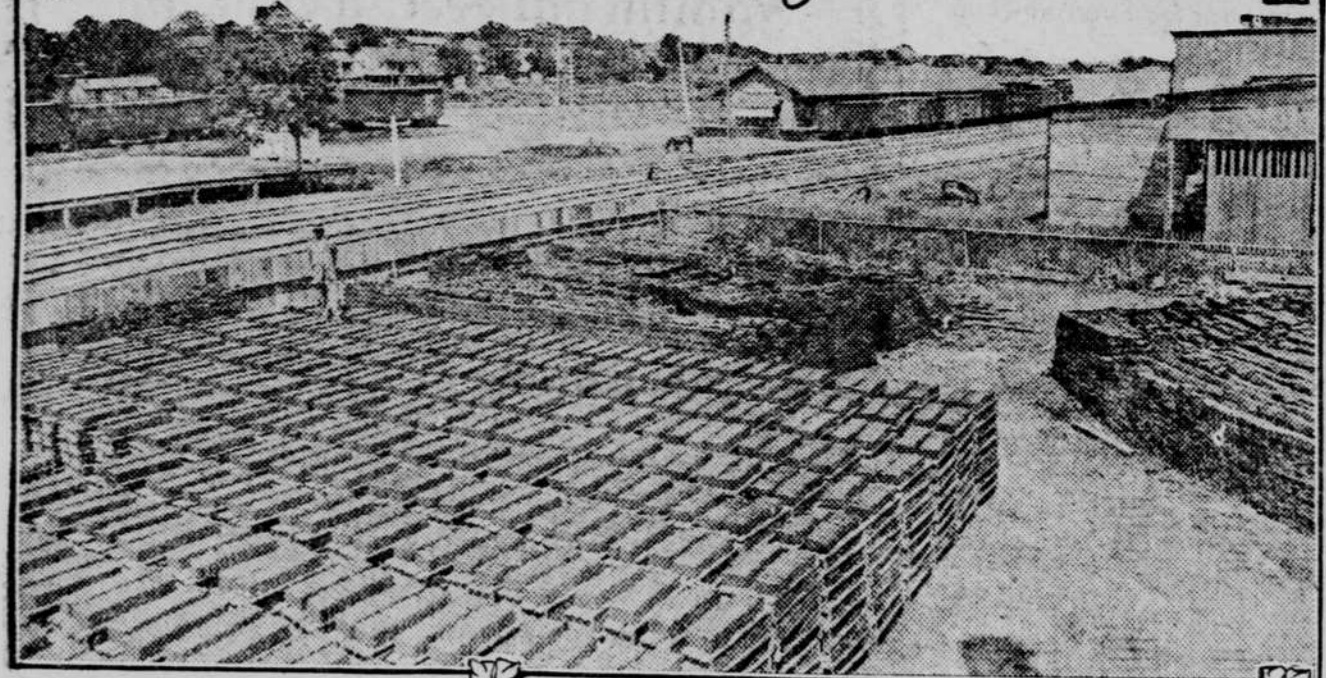


Turning Garbage into Fuel

By Robert H. Moulton



How cities and towns can convert this troublesome waste product into practical profit: An enterprise which promises to yield big returns to wide-awake communities in America

MANUFACTURING a high-grade fuel from garbage is a new industry that promises to solve the problem of disposing of the waste of cities and towns. In November of last year the first experimental plant of the new garbage disposal process was established in San Antonio, Tex. It proved so successful that the city of Austin decided to order the construction of a plant, and the factory, which was opened a few weeks ago, is now running to full capacity, taking care of all refuse in a sanitary manner and converting it into bricks of fuel which tests have proved to be the equal of bituminous coal. The inventor of the new fuel is Mr. E. L. Culver of Chicago, who began investigating the possibility and practicability of commercializing municipal garbage about five years ago. As a result of a long series of experiments he proved the adaptability of a method for making fuel bricks out of the refuse. In addition to the plant at Austin, Regina, Canada, has entered into contract for the erection of a municipal plant.

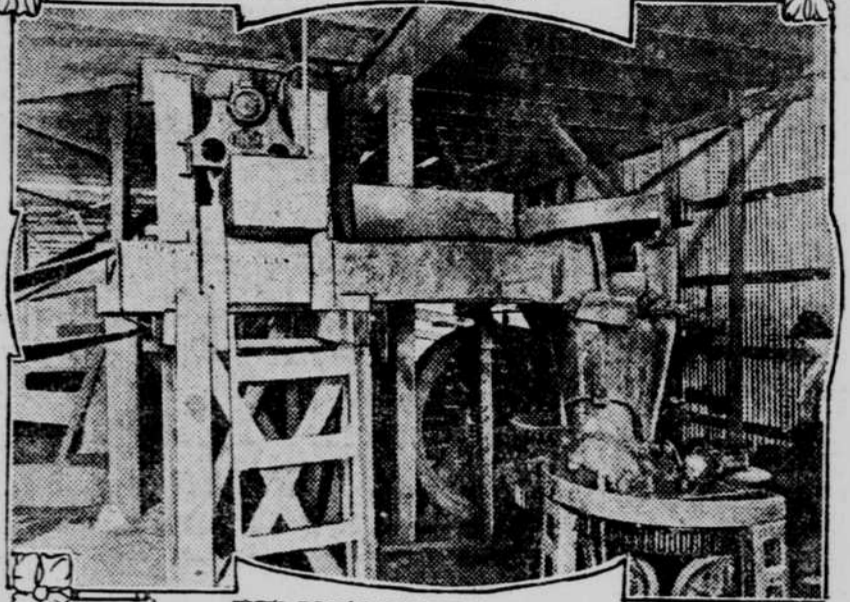
The process of manufacturing Oakool, a name given to the new fuel because of its similarity to oak wood in burning, is similar to the making of stiff mud bricks, practically the same machinery being used, although much less power is used, and less care is required to produce perfect bricks of fuel. The combination producing the best results for domestic purposes is a mixture of equal parts of coal dust—the waste dust from coal mines—and garbage, with the addition of about 7 per cent of coal tar. For steam purposes no coal dust is required. Each brick weighs, when dry, two pounds, so that 1,000 bricks make a ton. For convenience in handling, as well as the protection of the public against short weights, the fuel is sold on a schedule of prices for 1,000 or 100 bricks.

One stiff mud brick machine of the type used at the Austin plant turns out in eight hours' run, 25,000 bricks, or 25 tons of Oakool, and in erecting plants this is termed a one-unit plant, which has a full capacity of 75 tons daily. In erecting municipal plants, other units can be installed to suit the capacity of the city, or until all of the available binding material of the city is consumed. It is estimated that a city will produce for each one thousand people approximately a ton of garbage a day, or for domestic purposes over two tons of brick fuel.

The manufacture of the new fuel is extremely interesting inasmuch as it is made up entirely of waste material handled by common labor. The waste which the city formerly had to burn in an incinerator at a considerable expense is now taken by carts direct to the factory, where it is dumped on a sorting platform and sprayed with creosote as a sanitary precaution, as well as to allow the sorters to work in comfort. Openings are provided in these platforms where the different parts of the garbage are dropped into conveyors and conveyed as follows: the pieces of iron to a storage; the bottles to a washing tank, where they are sterilized before being stored; the rags to a washing machine, where they are sterilized by being washed in boiling water; the ashes, stone, brick, etc., to a storage and used for fills, and the tin cans to a press where they are baled and conveyed to storage.

That which is left and of a combustible nature is placed on a large 40-foot

GARBAGE FUEL BRICKS AT AUSTIN PLANT



FUEL BRICK MACHINERY



UNSORTED GARBAGE PILE

belt three feet wide and carried to a huge grinder which reduces it to fine pieces. From this grinder it is conveyed to a pulping machine, where hot water and live steam is applied together with a certain percentage of tar, which acts in conjunction with the hot water and steam as a thorough disinfectant of the product and also as deodorizer of the smoke of the fuel while being consumed as well as a deodorizer of the fuel itself. The mass is thoroughly mixed in this machine and is reduced to a pulp. From this machine the mass is conveyed to a mixer, where coal dust is added in the desired proportion, according to the purpose for which the fuel is to be used. For steam purposes, where rapid combustion is required, coal dust is unnecessary, although a very small percentage is sometimes used, while for domestic purposes, where a slow even fire is desired, the best results are obtained by the addition of 50 per cent of coal dust. From the mixer the mass drops into a molding machine where it is molded into bricks. Then it is conveyed through a drying kiln where the bricks are thoroughly dried.

All conveyors, elevators and machinery are tightly inclosed so that there is no escape of dust, and the only odor in the entire plant is the smell of creosote that is contained in the tar. For this reason it is perfectly possible to establish a plant in the business or residential districts of a city without being offensive. The remarkable spectacle of seeing old shoes, hats, paper, rags, straw, manure, house garbage, night soil and a variety of other waste products being thrown into one machine and emerging from another in the shape of a perfect fuel brick, without odor and bearing no resemblance whatever to the original materials, is almost miraculous.

Among the advantages claimed for the new fuel are that it will not slack, no matter how long it is kept in storage, that it is impervious to water, and that it burns to ashes without leaving a semblance of clinkers. It also produces practically no odor and very little smoke when burning. There is a very large percentage, often as high as 25 per cent, of the ordinary coals, that escapes through the grates without being consumed, so that it fre-

quently pays to sift the ashes in order to recover a portion of this amount. The fuel bricks, on the other hand, due to their shape and the thorough distribution of their parts, are consumed with almost perfect combustion. The shape of the brick is retained until it is entirely consumed, after which a fine, light, cigarlike ash remains.

Experiments made by Dr. William B. Phillips, director of the bureau of economic geology and technology of the University of Texas, showed that twelve pounds of the garbage fuel bricks will burn on an average of two and a half hours in a small stove, as against two hours and twenty minutes of the same amount of lump bituminous coal, and will produce the same amount of heat as the latter. The average cost of manufacturing the fuel at the Austin plant is about \$1.75 a ton, without considering the revenue derived by the city from the sale of by-products, such as rags, tin cans, bottles, brass, copper, zinc, rubber, etc.

Dr. F. M. Gunn of the Massachusetts Institute of Technology, who recently delivered a series of lectures on sanitation and garbage disposal at the University of Texas, expressed the opinion that the process which Mr. Culver invented is one of the most promising schemes so far advanced for handling city refuse; that it appeared to him that it was the best way of getting rid of waste and rubbish in a sanitary manner, and that the method might work a new epoch in the garbage and fuel problems of the country.

PLANT THAT MAKES "ICE"

Habits of the Frost Weed Have Long Proved a Puzzle to Botanists.

Late in autumn, after producing two sets of blooms, the frost weed becomes a miniature ice factory and forms crystals of "ice" about the cracked bark of the root. On each little broken rootlet there appear cakes of "ice," exactly right in size for the refrigerator of a fairy queen. As yet no botanist has been able to discover the secret of the plant's ice-making.

The ice appears often long before ice is formed on the ponds, and can be found by digging up the deeply set rootlets.

Two blooming seasons is another peculiarity of the plant. Early in June it sends out a wealth of golden yellow blossoms, having five petals each and set at intervals upon the thickly leaved stem.

Then late in August the plant flowers again, producing blooms identical with those of the earlier season.

Nothing But the Truth.
She was beginning to carry weight for age, and he wasn't as young as he was a year previous.
"Do you believe in long engagements?" he asked cautiously.
"Ah," she sighed. "I'll believe in any kind you prefer if you'll give me a chance."

A Trifle Ambiguous.
Max—Don't you like the sawdust circle?
Dax—Are you talking about the circus or coconut pie?

Heads the Procession.
Singleton—Wedderly surely does like to parade his misfortunes.
Oldbach—What do you mean by that?
Singleton—I notice he always accompanies his wife and her mother to church.

Education.
Jones—Was that a new language your daughter was speaking to her college chum?
Brown—No; that was boarding school slang.

DESSERT OF MERIT

CHARLOTTE'S EASY TO MAKE AND WILL BE LIKED.

Sponge Cake the Foundation of Delicacy That Is Worthy of a Place on Every Luncheon or Tea Table.

Charlotte's are easily made, and as they can be varied widely, they are worth serving often. The foundation of a charlotte is a case of sponge cake filled with whipped cream.

Lady fingers or small sponge cakes cut in two, or slices of sponge cake cut in narrow strips, can be used for the case. The sponge cake, in whatever form, can be placed as a lining to a glass dessert dish, or it can be placed in individual dessert glasses. Lady fingers can be split and piled log-cabin fashion and the cream put into them. Or the sponge cake can be put around the sides and bottom of a mold and held in place with a little liquid gelatin. When the gelatin hardens the cream is put in.

This combining gelatin and sponge cake and whipped cream leads to much variety. Lemon, orange, wine and grape-juice jelly are delicious used in this way.

As for the charlotte filling of whipped cream, that, too, can be varied. Stiff egg whites can be folded into whipped cream to increase the bulk and make the mixture lighter if desired.

The cream should not be sweetened too highly. It can be flavored simply with vanilla.

Candied fruits can be cut into tiny shreds and mixed in the whipped cream.

Orange pulp cut into bits can be mixed with sweetened whipped cream.

Stewed figs can be cut into small bits and mixed with the filling for a charlotte.

Fresh berries of any sort almost, especially strawberries and red raspberries, can be mixed into the cream for a charlotte russe.

A big sponge cake can be hollowed out inside and the charlotte filling piled into the cavity.

Many desserts have interesting histories. This is one of them. But nobody is sure of its history. The French claim that Charlotte de Medici either originated this dessert or that it was named for her, and the English say it is a namesake of Charlotte, queen of George III.

Hungarian Tongue.

Take a fresh beef tongue, put in stew pan with a carrot, an onion, a clove of garlic, a bay leaf, a teaspoonful of salt, half a dozen peppercorns, half a fresh lemon, sliced, and as much water as will cover it. Let it boil, then draw saucepan to the side of the fire, simmer gently until the tongue is quite tender. Take off the skin and trim the tongue neatly; strain and reduce gravy. Mix a tablespoonful of flour very smoothly with two ounces of butter. Keep stirring over the fire until it is lightly browned, and steam a bruised clove of garlic in the browning. Add gradually three-quarters of a pint of gravy and when quite smooth and thick stir in the juice of half a lemon. Pour a little of the sauce into the dish with the tongue, and send rest to table in a tureen. Garnish the dish with parsley and sliced lemon. Two hours to simmer tongue. Sufficient for eight or nine people.

Crullers.

Make a stiff batter of one cupful of lukewarm milk, one yeast cake dissolved in one-quarter cupful of lukewarm water, one teaspoonful salt and flour. Let rise one hour, add one cupful of sugar, one-quarter cupful butter melted, three eggs well beaten, one-half nutmeg grated, and flour enough to make a stiff dough. Let rise again, toss on a floured board, pat and roll out. Cut in strips, three-quarter-inch wide and ten inches long, let rise again on a floured board, then twist and put into deep fat. Fry until delicately browned, drain on brown paper and sprinkle with sugar.

Herring and Cheese Canapes.

Prepare the canapes by cutting slices of bread half an inch thick, then stamping out two small rounds from each slice. Fry a light color and spread with the herring paste. Meanwhile put about a cupful of leftover cheese in a small saucepan and stand it in a vessel of boiling water on the stove. Add two tablespoonfuls of milk and a piece of saleratus the size of a small bean. Stir frequently until it is quite smooth. Then put the prepared canapes on a bakepan and divide the melted cheese equally over them and put in the oven about five or six minutes to heat. Serve immediately on hot plates.

Duck With Peas.

Put the duck in a deep stewpan with a piece of butter (single at first), flour it and turn it two or three times, then pour out all the fat. Put the duck in a pint of good gravy, the same of peas, two lettuce cut small, sweet herbs, pepper and salt; cover close and stew half an hour. When well done thicken with a little butter and flour, shake all together three or four minutes and serve in a dish, the duck with the sauce poured over it.

Plum Whip.

Cut blue plums in halves, stew in sirup until tender, drain and rub through a coarse sieve enough of the pulp to make one cupful. Beat the whites of four eggs to a standing froth, add the plum pulp gradually and beat for 20 minutes. Serve with a custard sauce flavored with vanilla.

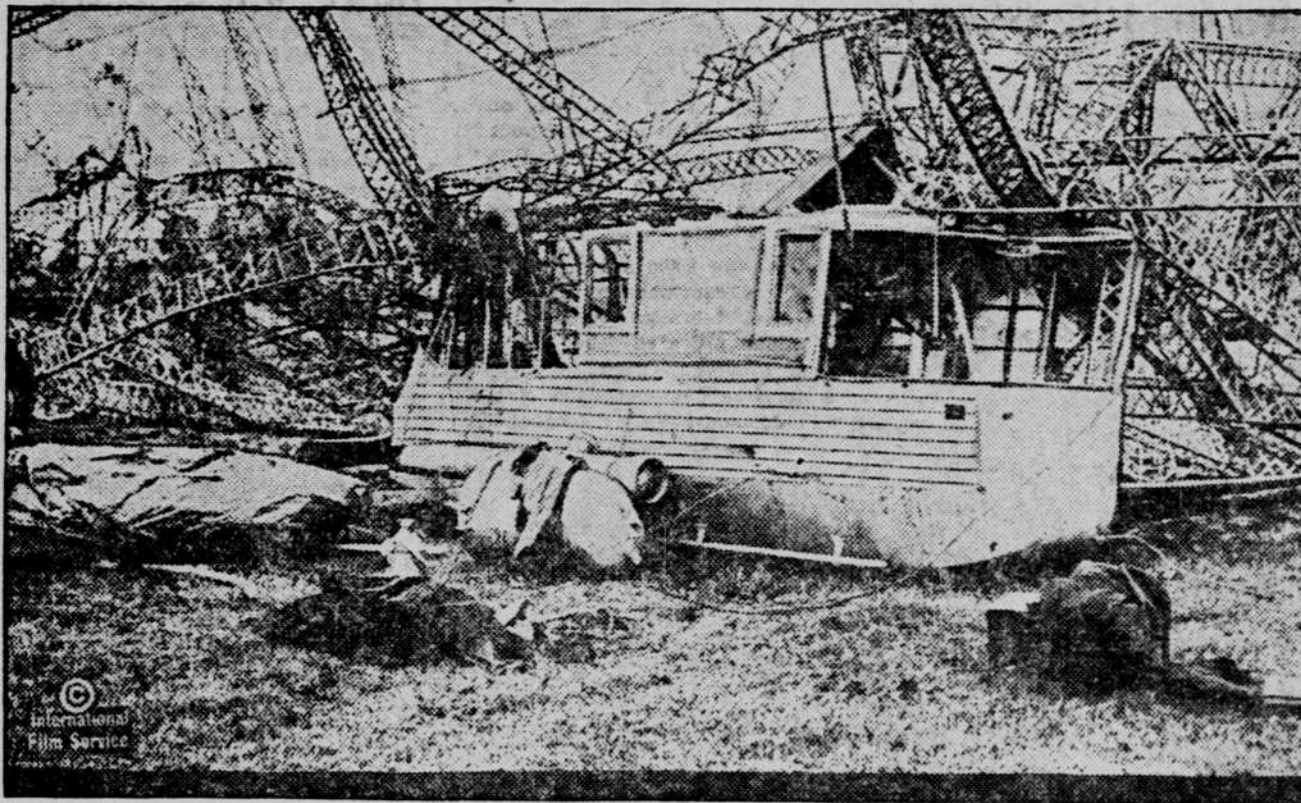
To Remove Egg Shells.

If, when breaking eggs into a bowl, a piece of shell gets into the egg just touch it with the half shell and it can be easily removed.

Mustard for the Hands.

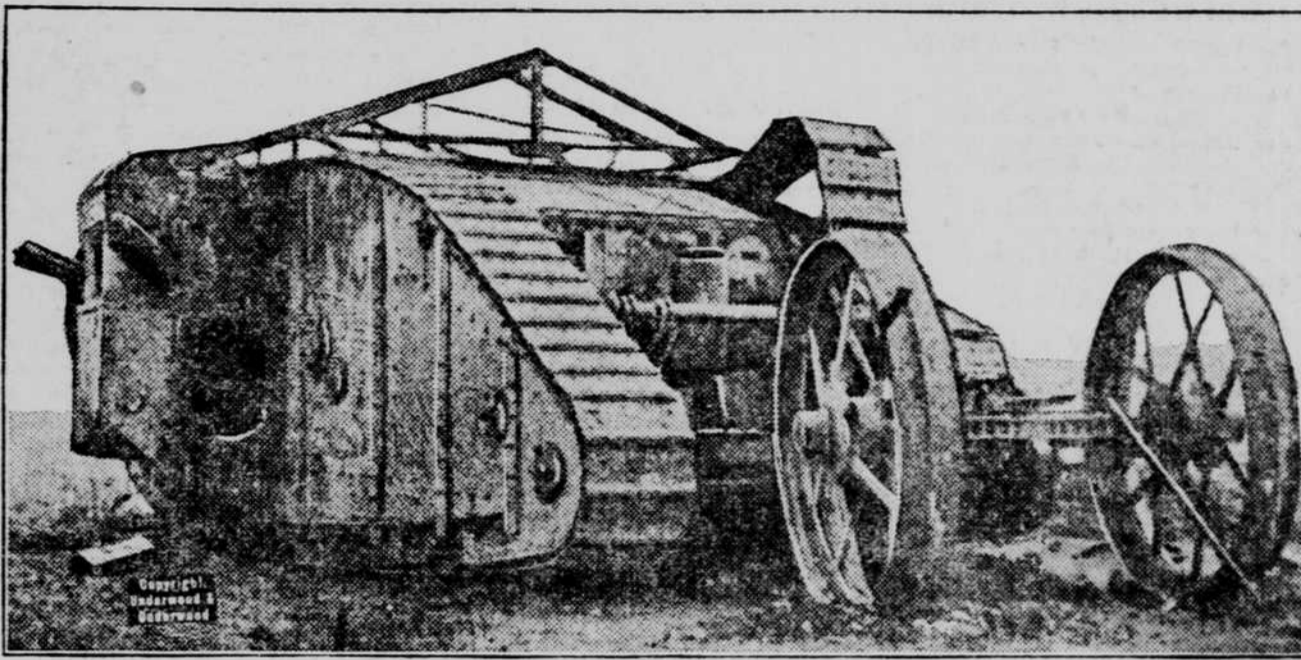
Ground mustard is excellent for cleaning the hands after handling onions and other strong smelling things.

WRECK OF GREAT ZEPPELIN NEAR LONDON



The photograph shows the wreck of the giant Zeppelin brought down by anti-aircraft guns near London. The gondola attached to the Zeppelin was barely touched by the flames that demolished the rest of the aircraft.

FIRST PHOTOGRAPH OF FAMOUS BRITISH "TANK"



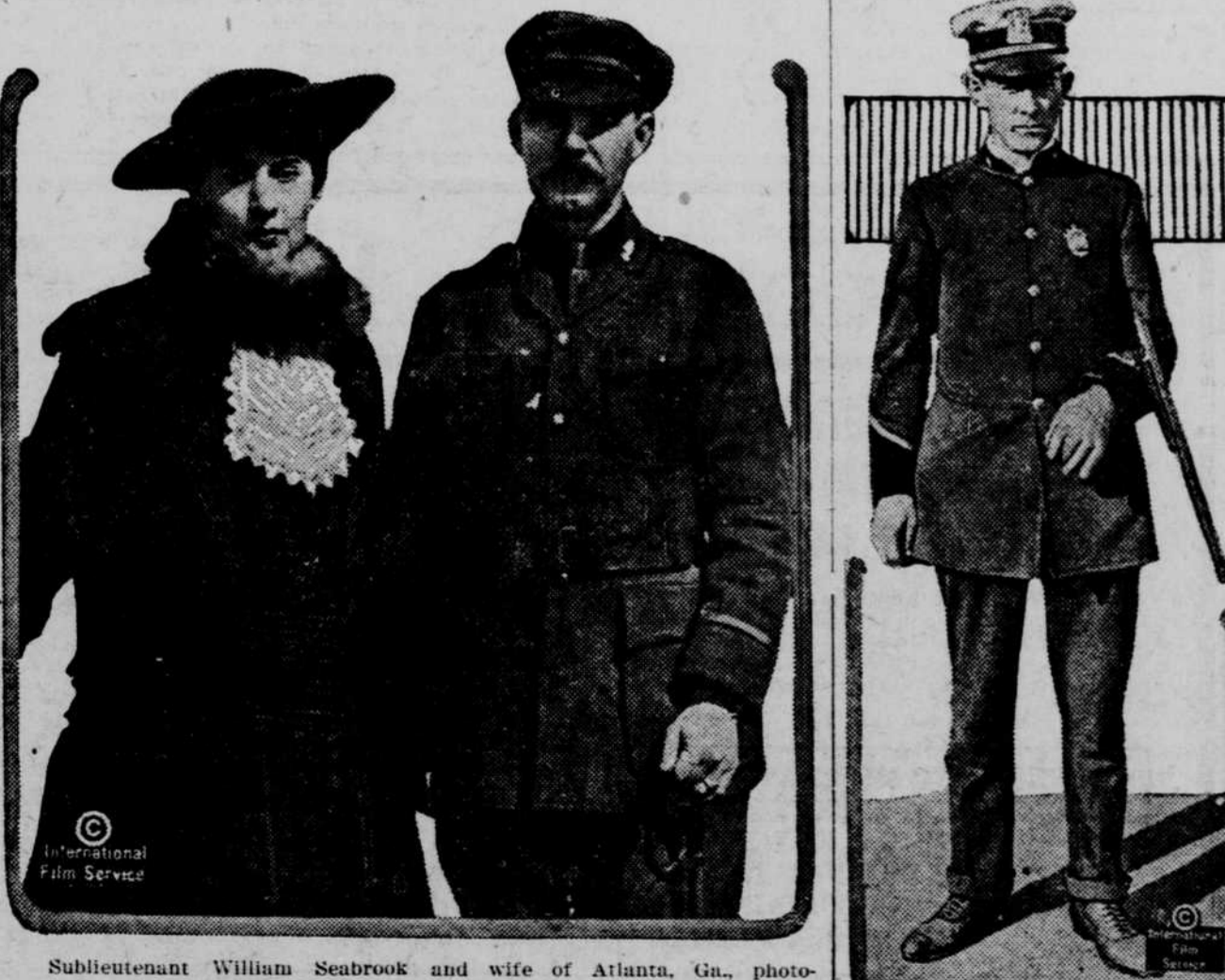
This is the first photograph to reach the United States of one of the British armored "tanks," the great steel protected monsters that were used in the battle of the Somme. They cross streams, climb hills and crawl over shell holes and trenches.

MACHINE GUN BOARD AT WORK



Nine men appointed by the secretary of war, two of whom are civilians, constitute a board which is inspecting and testing the existing types of machine guns with a view to the adoption of one or more models for use by the United States army. They will recommend the type or types of machine guns on which \$12,000,000, appropriated by the last congress for the purchase of machine guns will be spent. The members of the board are, from left to right: Col. Tracy C. Dickson; Lieut. Stephen C. Rowan; Col. Henry D. Todd, Jr.; Capt. Robert H. Willis, Bascom Little, Capt. Edward P. Cole, B. M. W. Hanson, Col. Joseph E. Dickman, Gen. Francis H. French, chairman.

THEY HAVE BEEN AIDING THE FRENCH FIGHTS BAYONNE STRIKERS



Sublieutenant William Seabrook and wife of Atlanta, Ga., photographed on their arrival in New York on the French liner Espagne. Mr. Seabrook has been in the midst of the allied drive on the Somme for the last six months as a member of the American ambulance corps. Mrs. Seabrook during this period acted as nurse in one of the base hospitals of the same organization.

The man who has proved a terror to the striking employees of the Standard Oil company at Bayonne, N. J., is Inspector Daniel Cady.

FROM ALL OVER

Argentina has enacted civil service retirement legislation.

Seventy-six American cities have public employment bureaus.

A telephone wire swings for 1,200 yards across the Yukon river.

Mary Cerzenak, sixty-six, died in Wilkes-Barre, Pa., of infantile paralysis.

According to a British chemist, tobacco ashes contain 20 per cent of potash.

A sewing machine has been invented to stitch together baseball covers.

California orchards are piped for the purpose of conveying spraying solution to the trees.

Youngstown (O.) business men have formed a corporation to build dwellings for workmen.

A handkerchief for children has been invented that has a secure pocket for money in one corner.

The water of a Spanish river petrifies the sand in its bed and cements together stones thrown into it.

GATHERED FACTS

One automobile to every eight families is the ratio which will be reached in the United States this year.

Three thousand women spend their lives in driving and steering the canal boats in southern and midland England.

The Cuban government has ordered all bakeries to use bread-making machinery, on the ground that mixing the dough by hand is dangerous to public health.

CONDENSATIONS

Italian olive trees are being cut down for fuel.

In a town in the heart of Russian salt fields many houses are built of salt.

An Indian tribe in Bolivia shuns the whites and lives as in the stone age, making tools and weapons of stone, bone and wood.

A centrifugal pump directly connected with an electric motor that runs equally well either in or out of water has been invented by an Englishman.

Porous lead, filled with microscopic cavities, has been invented by a Danish scientist to diminish the weight and increase the surface of storage batteries.

Bangor, Me., says that it has the distinction of being the only city in New England in which the city council has appropriated money for the aid of soldiers' families. With contributions, this fund now amounts to \$10,000.

Japan's ambitious plan for making its railways broad gauge will take until 1943 for completion, it is estimated, and will cost something like \$700,000,000.

The capacity of a clothesline is doubled by a new device that straddles the line and provides two pieces of wire to which clothes can be fastened.

The cow-tree, which grows in Venezuela, forms a natural dairy. Its sap is similar to milk and is used as such by the natives.

According to the manufacturing plans of the 30 large rubber-tire companies in the United States, their output during the present calendar year will exceed 11,000,000 tires, of an average value of \$20 at retail.

To enable those unacquainted with any sign language to converse with deaf mutes, a Frenchman has invented a device resembling a typewriter, which raises letters to spell words as keys are pressed.