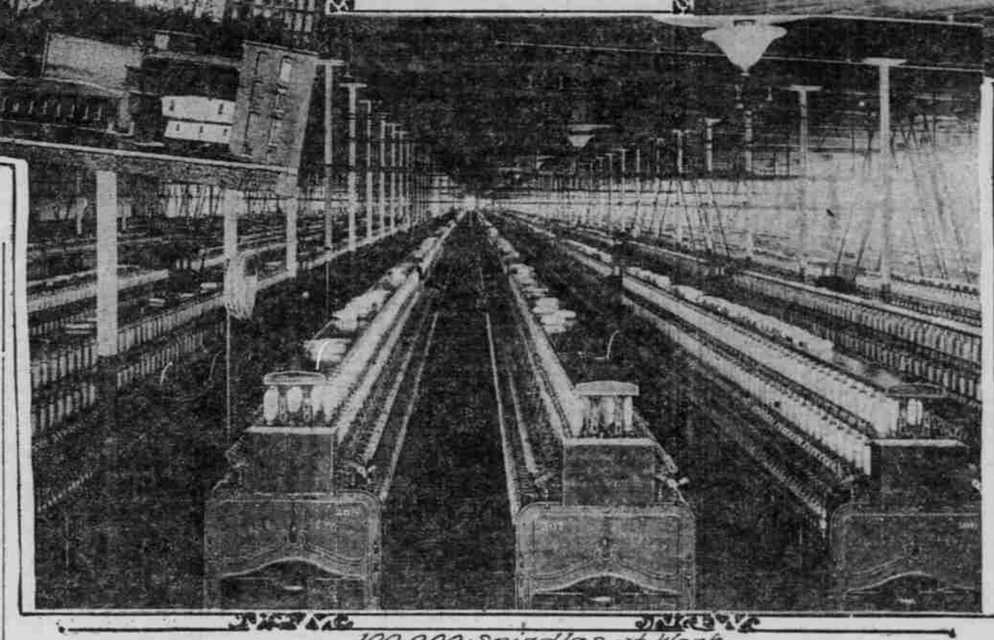
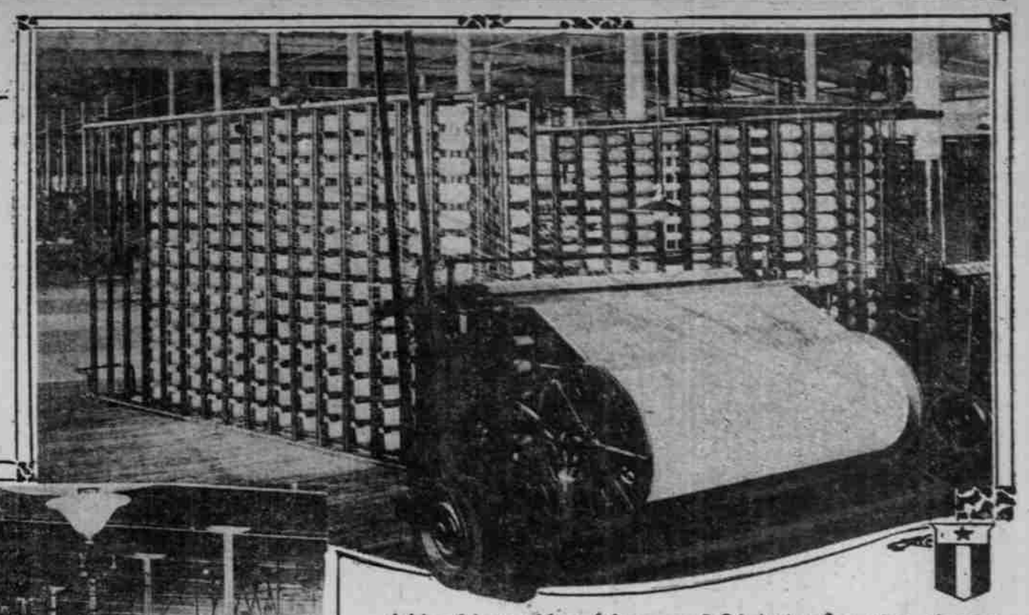
MILE of CLOTHES A MINUTE

Frank G. Carpenter Traces Soldier's Shirt From Cotton Belt to Trenches.

One of the Mills Making Shirts for the Soldiers Contains 12 Acres of Floor Space, 100,000 Spindles and 4000 Looms.



100,000 Spindles at Work.



Winding the Warp of Shirts for the Army.

(Copyright, 1918, by Frank G. Carpenter.)

MANCHESTER, N. H.—This is a story of the shirt of the soldier. It relates to the clothes our boys wear in the trenches. They have eaten up cotton by the millions of bales and are now coming out of the looms by the tens of millions of yards. The first chapters of the story have already been published. I have described the cotton fields of the South and shown how the little black seeds dropped in the furrows come forth and and produce the white lint. I have described its path through the gin, where it is torn by saws from the seeds and packed up in great bales of 500 pounds each, and I have shown you these bales on their way to the market. In this leter I want you to follow the bales to New England and see how they are transformed into the cotton cloth from which the shirt of the soldier is made. There is no better place to see this than right here at the Amoskeag Falls of the Merrimac River. These falls are in the heart of the city of Manchester, and about them has grown up the greatest cotton mill of the United States, if not of the world. Just now the most of its work is confined to the Army.

Can you imagine a factory so big and so efficient that it takes the raw cotton in at one end and runs it out in cloth at the other at the rate of 60 miles every hour, and keeps up that speed all the year through? The cotton comes forth as fast as the highest-powered automobiles fly over the road. You might hitch the cloth as it comes from the looms to a lightning express train and start the locomotive off at full speed and there would be no slack or break in the cloth. It would keep up with the train, even though the cars were kept running for nine hours a day all the year through. If started here in New Hampshire the first day's output would reach almost to Pittsburg, and by the end of the second day the train pulling the cloth would be at the edge of Chicago. Within four days it would be far beyond Denver, and by the end of the week it would have reached San Francisco, and if you could get a ship that would go 60 miles an hour it might be carried unbroken across the Pacific Ocean to Shanghai in ten days thereafter. The output of the mill is about 500 miles daily, and the output per year equals a strip of cloth almost 150,000 miles long. That strip would carpet a motor car road 18 feet wide around the world, or, if you should make the strip a yard wide, it would reach around the earth and still have enough to cover a three-foot path half way to the moon.

The cotton is coming forth now at the rate of about a mile a minute, and a large part of each mile is for shirts to be made for the soldiers. The shirtings of that kind already produced number more than 1,500,000 yards, enough to reach almost all the way from New Orleans to Chicago. It was enough to supply a shirt apiece for 1,000,000 soldiers.

The same factory is making vast quantities of worsteds for the Army. It turns out something like 60 miles of them every week. It makes the barracks bag which every soldier carries to France. This is woven in a cylinder of strong cotton cloth, and the buttons are sewed in on machines run by girls. The bag looks much like a laundry bag we use in traveling. The room in which it is made covers more than an acre, and the foreman thereof tells me that he is weaving such bags at the rate of 100,000 per hour.

The factories where all this is going on are right here at Manchester. They belong to one company and they have produced a cotton mill center which is larger than that of any single company in Great Britain. It is, I venture, one of the oldest factories of the world. It began to spin and weave cotton within a generation or so after the spinning-jenny was invented by Hargreaves, and shortly after the British barber and hair dyer named Arkwright had put up his factories in England for his new inventions of spinning and carding machines; and it has been making more or less cotton cloth from that time until now.

The first mill was established when Thomas Jefferson was President of the United States, and the present company had its origin when Andrew Jackson held the office which Woodrow Wilson holds now. There is a tradition here that Andrew Jackson rode through Manchester in a beautiful barouche drawn by four milk-white horses and that he visited the cotton factory and rode for a mile between two rows of mill girls, who greeted him with songs and flowers. As he looked at the mills Mr. Slater, one of the officials of the company, was among his entertainers. He called Slater the father of American manufacturers, and said:

"I understand that you showed us how to spin as well as they do in Great Britain and that by the Eternal in spite of all the British could do. You started these spindles to work, which are giving employment to thousands and which will make us an industrial people!"

To this Mr. Slater replied: "I suppose I did give out the psalm, but our workmen have been singing to the tune ever since."

The factories steadily grew. They were making goods for the soldiers at the time of the Mexican war, and 10 years later were turning out 72,000 yards of cloth for every working day. They made a large part of the cotton used in the Civil War and they have been steadily increasing in size and output from that time until now.

The industry was first based on the falls of the Merrimac River, which here have a drop about one-third that of Niagara. The first mill used the waterpower only, and the great buildings are now scattered along the river at different levels to take advantage of it. Later on electricity was generated by turbine wheels, but the business soon surpassed the strength of the stream, and now three-fourths of the power used in the mills comes from steam generated by coal. Indeed, the business depends so much upon coal that it is a question whether it could not have been more advantageously located at the seaboard, where the freight rates for fuel and raw materials would be much cheaper and also those for some of the export of its product.

It is strange that the cotton mills of the world should be located so far away from the cotton belt. We have a spinning and weaving industry in the South, but two-thirds of our cotton is spun in the North, and most of the world's cotton is woven from 1000 to 3000 miles from where the cotton is grown. A vast deal of it is made in Great Britain, which has more than two-fifths of all the cotton factories on earth and eats up more than 20 per cent of the product. The world's cotton mills altogether number something like 6500. They are scattered throughout 39 countries, and consume about 20,000,000 bales of cotton a year. Of this more than one-third is woven in the United States and two-thirds of the latter amount here in New England. The Amoskeag Company alone has almost 700,000 spindles for cotton and worsted. It has more than 24,000 looms.

The cotton operatives of the world altogether number three or four millions and a large number of them are women. The great factory here employs 16,000 hands, a greater number than we have soldiers in any one of our Army divisions in France. About 7000 of these are women, and they receive higher wages, perhaps, than any other cotton workers on earth outside of this section of the country. Of the whole force in the Amoskeag, there are only a few score under 16 years of age, and the youngest girls make $8 or $9 a week. Some years ago I visited the cotton mills at Manchester, England, and the managers told me that they were paying their factory women from $4 to $6 per week. The wages have probably increased since the war. It seems to me that the women there do not compare in ability or efficiency with the girls employed here at Manchester. Here a single girl will manage several looms, and the most complicated machines are in the hands of the women. Many of the machines are automatic, and the noise of the factory is little in comparison with that of the old mills of England. As I went through the British factories it was a wonder to me how hundreds of girls could work together without being able to gossip. I mentioned this to my guide, who replied: "Why, bless you, man, these girls are the greatest talkers on earth. They were talking all the while we were in the mill, but the noise is such that they have learned to listen with the eyes and not with the ears. They have learned the lip language and can tell what any one says by watching the movement of his lips."

The factory girls of Manchester, N. H., are better looking and better dressed than those of Manchester, England. Here the girls have no special costumes. The girls of Manchester, England, wear calico dresses with short sleeves and a short skirt. Below the skirt show out their stockings and clogs. The clogs are a peculiarity to that class of employment. They have leather uppers with soles of wood on which bands of iron are tacked. This makes a great clatter as they move about, reminding one of the noise in a Japanese railroad station, where the passengers run over the platform in their wooden shoes. Most of the English factory girls pay but little attention to their personal appearance while at work. I saw hundreds of them who had their hair in crimping pins so tight that the skins of their foreheads were stretched like that of a tambourine. I was told that they kept their hair in crimping pins all the week and took it out only on Sundays and holidays.

But to get back to the shirt of the soldier. If you would see the material of which it is made you must start at that part of the factory where the huge cotton bales are opened up and torn into pieces. Pick up a handful of the cotton wool and examine the fibers. Pull them apart and spread them out on your hand. They look like white hairs, but they are very much thinner. They are so thin that a thousand of them might be laid side by side and they would not cover an inch. It takes millions to make one spool of thread, and there are several hundred millions in each soldier's shirt. It takes about one pound of raw cotton, an amount which can be spun into a single thread one hundred miles long.

Now if you will examine the fibers more closely you will see that each has a little curl or twist to it, and if you will put it under a microscope you will see that it has on its outsides many little scales overlapping each other like the scales of a fish. It is these scales which catch when the fibers are woven and make them cling tightly together. The curl or twist also aids to make the fibers combine, and better fits them for spinning and weaving. If you look at the end of the fiber under the microscope you will see that it is hollow. This makes it take the dye better so that it can be easily turned from the snowy white to the olive drab of the shirt of the soldier.

In this factory the fibers are dyed before they are spun. The mills have a great dye plant, where the white lint is put into steel tubs each so big around that an ox could easily be scalded within it. When the tub has been packed to its utmost a lid is forced on by great pressure and the dye stuff admitted in such a way that it penetrates every fiber, giving it a uniform coloring in the thread and the cloth. These mills make goods of every description. They make calicos and ginghams and all sorts of fine goods for women, and the hues embrace all the colors of the rainbow. They are able to do this even now, notwithstanding they can get no dyes from Germany, which formerly supplied the most of the dyes of the world. The manager of the factory tells me that the company had great stores of dyestuffs on hand at the time the war began, and that it still has supplies that will last it for years. He says many of these dyes are being replaced by those made in America, and that the company has created a little dye plant of its own, where it is making some special colors, one of which is dead black.

It is a long journey through the Amoskeag mills from the cotton bales to the olive drab shirtings which are shipped to the factories, where they are made into clothes for the Army. The mills here altogether have 137 acres of floor space, and the whole of this is filled with machinery of the most intricate nature. It is run by electricity and the most of it goes at dynamic speed.

I despair of giving you accurate pictures of all the processes through which the fibers go on their way from the bale to the shirt. As the cotton comes from the plantation it is of different varieties. Some of it has fibers longer than others, and the bales have to be opened and the different kinds of cotton mixed together, so that the product will be of the uniform quality which the Government requires.

The cotton has to be torn loose by machines, which pull it apart. It is beaten up by other machines, and the dust, leaves, sticks and dirt are blown out. It is then run over great cylinders or rollers, called openers, and so treated that when it leaves them there is not a stick, leaf or grain of sand in it. The lint is now as soft as swan's down and whiter than when it was picked in the field.

The fibers, however, are all mixed together. They are turned this way and that and they cross and re-cross one another. They must all be laid the same way before they can be spun into thread. This work is done by the carding machines huge rollers covered with little wire teeth, which brush and comb the fibers as they pass through, much as we comb our hair. The teeth are so fine that there are more than a hundred on a space as big around as a cent. The cotton goes into the carders in a wide fleecy sheet. The teeth straightens the fibers and roll them over and over so that when they come out they are almost all laid the same way, and they are in the shape of a thick rope of soft cotton yarn. This rope is known as a sliver. It is as big round as a broom handle, and it seems thick enough to make a dozen of the fine threads used for weaving. It is not thick enough to make one. The slivers next go through drawing machines, where a number of them are combined and come out as one which is more uniform in thickness than those which go in and where the fibers are still more nearly parallel. This is called drawing. The ropes then pass through the slubbing machine, in which the slivers are still further drawn out, and are wound upon bobbins. They are now ready for the spinning machines, on which the threads for both the warp and woof are spun. The threads are now as fine as those of spool cotton. They are of uniform thickness and are ready for weaving.

The term weaving covers the processes of putting the threads together as you find them in the cloth of the shirt. The cloth is formed by two sets of thread. Those which run lengthwise are known as the warp, and the others, which cross the long thread at right angles, going over and under them from side to side, are the woof. To fit the threads for these processes they have to be spooled. They are wound from the spindles on bobbins, and from them the warp threads pass through machines which wind them evenly upon a long cylinder the width of the cloth. The woof threads are wound upon little bobbins, which are put into shuttles and thrown by machinery through the warp thread. They go so fast you can hardly see them, making a speed of 150 or more times to the minute. At the end you have the cloth used in the shirt.

There are many other processes in addition to those I have described, and there are other machines of wonderful efficiency for carrying them out. Much of the spinning and weaving is performed by automatic machines, and the complexity and magnitude of the operation can be appreciated only by going through the mill while the work is in progress. Some of the rooms I have visited cover more than an acre. I went through one five-story building which had seven acres of wonderful machines of one kind or another, and during my trip I saw 4000 looms making cotton and worsted for clothes for the Army.

The same processes may be seen going on at hundreds of other great factories in different parts of New England and throughout the South, employing hundreds of thousands of the most skilled workmen and work-women of Uncle Sam's great industrial army. The soldiers of the spinning and weaving divisions mix patriotism with their work, and almost every one of them is a subscriber to the Red Cross and the liberty loan. I saw the American flag in many of the rooms of this factory, and was told that the employes had gone over the top in their subscriptions to war charities, thrift stamps and liberty bonds.

Modern Poultry Culture

The cares and worries of the brooding season are now practically over, and the poultry keeper must begin the weeding-out process in his young stock, so that none but the very best birds will be matured for future use.

BY CHARLES L. OPPERMAN,

Formerly State Poultryman of Maryland.

ON ACCOUNT of the scarcity of red meat, which logically creates a brisk demand for other forms of flesh, such as poultry and fish, and owing to the extremely high price of feed, it is absolutely essential that every surplus cockerel and inferior pullet should be fattened for market and disposed of at the earliest possible moment in order to keep down expenses. Useless young stock that is allowed to run with the rest of the flock until late Summer or early Fall develops into birds that are neither broilers nor roasters, and as a consequence are placed in the mixed poultry class when offered on the market.

The price for this kind of stock is much less than that offered for good broilers, fryers or roasters. This loss of profit can be eliminated by culling the young stock soon after the weaning age and fattening for market all surplus cokerels and inferior pullets.

How to Cull Flock.

If selection for health and vigor is made the important issue in culling the young stock, there is little danger of serious mistakes on the part of the poultry keeper, even though he be a novice. It matters not how perfect a bird's comb may be nor how beautiful its plumage, if it does not possess health and vitality it is a mistake to retain it for laying or breeding purposes. It is not difficult to discriminate between vigorous and physically unfit specimens.

The vigorous, healthy bird will have a clear, bright eye; a short, well-formed head; clean, glossy plumage; a breast bone well covered with meat; strong, sturdy legs; and be a hard worker and a heavy feeder. The physically unfit bird manifests just the opposite characteristics. It is dopey and inactive; has a long, slender beak and crow-like head; its eye is weak and dull; its plumage is dirty and rough; and it has a general anemic appearance, being poorly fleshed on the breast and other parts of the body.

It is true, of course, that every weak and sickly bird will not manifest all these characteristics, yet in a general way they will be present in a greater or less degree, depending on the health and vigor of the bird. With few exceptions the majority of the young stock that is discarded on account of lack of vitality can be fattened by special feeding and disposed of at a profit.

In addition to culling for health and vigor, all cockerels and pullets that exhibit malformation or characteristics that render them unfit for layers or breeders should be separated from the flock and put in condition for the market. Pullets that have crooked legs and toes, clipped wings or similar defects, come under this classification.

It is not necessary to discard birds that have disqualifications such as improperly colored plumage, poor combs and the like, unless the object is to breed prize-winning specimens. Such birds will produce as many eggs as those that are perfect from the standpoint of the showroom, and should be retained as layers, provided they are not used later in the breeding pens.

The backyard poultry keeper who raises a small flock should fatten the cockerels and pullets that, for one or more reasons, are not suited for laying purposes. By following such a plan the birds can be utilized in the home in place of red meat, and the "backlotter" will thereby add his or her "bit" to the ever-increasing effort to conserve the red meat which is so urgently needed by our allies.

Fattening for Finish.

A great many poultry keepers make the mistake of shipping surplus cockerels and other stock just as they come from the flocks at culling time. It is only in exceptional cases that such birds are in prime market condition at this time, therefore considerable profit is lost by the failure to put these broilers and fryers in the pink of condition through special feeding for ten days or two weeks. The grower who is willing to go to this extra trouble and expense will be fully repaid for his efforts. It is by doing things a little better than the other fellow that one gets in on the high market.

Whenever there is a considerable number of birds to be fattened, a good plan is to confine them to colony houses and small yards and follow what is commonly known as pen feeding. The sanitary condition of the yards and houses must be carefully looked after, as it is essential to confine the birds to a rather small space in order to limit undue exercise. The best method of feeding to insure quick gains in weight is to give three times daily a ration of ground grains mixed to the consistency of thick cream, with skim milk, buttermilk or water.

A good ration for this purpose is one composed of five pounds bran, 12 pounds cornmeal, 12 pounds middlings, 12 pounds ground oats and seven pounds high-grade meat meal. This may be supplied in C-shaped troughs, giving what the birds will clean up in about 30 minutes. All food that remains should be removed after this period. Plenty of grit and pure water should be available at all times, and some form of green food supplied daily. After ten days or two weeks on this diet the birds are ready for market.

The "backlotter" and home-acre poultry grower will not want to fatten the cockerels in quite the same fashion as that described above for the larger establishments. Most of the back-yard birds are consumed at home, which calls for a plan of feeding that will keep them in a good condition of flesh for a period of two or three months. This may be accomplished by giving a light feed of grain in the litter for the morning meal, table scraps and ground grains at noon, and whole grain wheat at night.

If all the whole grain is fed in a deep litter, the birds will obtain sufficient exercise to keep them in good physical condition for an indefinite period. The noon mash may be composed of equal parts of bran and cornmeal, mixed with scraps from the table, or 10 per cent of meat meal. Waste vegetables from the kitchen and garden can be used to supply green food. Plenty of water and grit must be supplied at all times. No yard or run need be provided unless there is space enough to permit it.

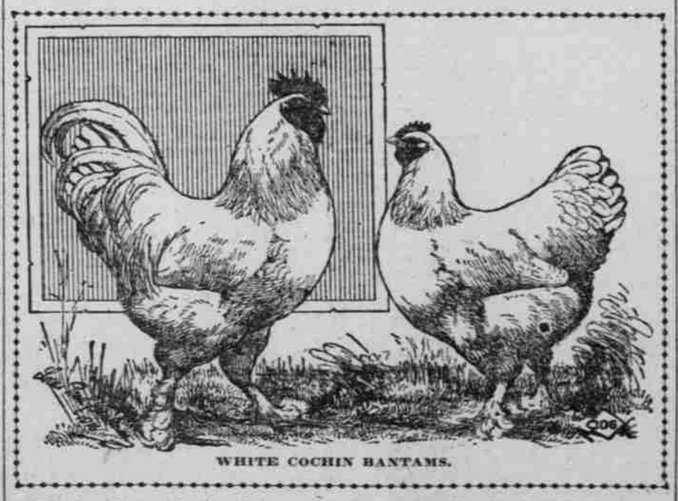
Caponizing Is Profitable.

From present indications the farmer and commercial poultry grower may find it profitable to grow a good-sized flock of capons during the present year. The fact that there is a scarcity of adult fowls on the farms, due to the killing off of so many flocks on account of the abnormally high price of feeds, bids fair to create a good market for this class of poultry next Fall and Winter. A few weeks ago capons were bringing from 40 to 45 cents a pound.

Under present conditions the field of capon production is limited to those who have an abundance of free range, where the birds can pick up a goodly portion of their living. The general farm, with its orchard, pasture field and so on makes an ideal place for growing 25 or 50 capons at a small outlay. Likewise, commercial poultry farms that have plenty of range are in a position to produce capons at a reasonable cost.

A capon bears the same relation to the rooster that the steer does to the bull. Owing to its quiet disposition it puts on flesh rapidly and frequently attains a weight of 10 or 12 pounds. The meat is tender and juicy, which makes it extremely desirable for roasting. Capons are used quite extensively during the holidays in place of turkeys.

The best time to perform the operation is when the cockerels weigh from a pound and three-quarters to two pounds. If the birds are permitted to get much larger the operation is too hard on them and there is danger of loss. Full directions for performing the operation are furnished with the necessary tools that are manufactured for this purpose. While the operation is not very difficult, the beginner should never attempt it until he has practiced on dead birds or watched some experienced operator work.



WHITE COCHIN BANTAMS.

This breed was developed from the Pekin Bantams, which were a part of the spoils obtained at Pekin, China, and sent to England by the British. After being inbred for a number of years these fowls lost stamina, and as there was no way to obtain new blood, the English fanciers then commenced crossing other breeds in an effort to save the Pekins from dying out. The Nankin Bantam was used and also the large Cochins. These infusions of new blood saved the breed and brought out some off-colored birds, among them being the Whites and the Blacks. Crossing with common White Bantams and White Booted Bantams helped to fix the color characteristics.

In America White Cochin Bantams originated from "sports" or albinos from the Buffs. English White Cochin Bantams were imported and the two blood lines were intermingled with excellent results.

The White Cochin Bantams of American origin were very brassy or yellow, while those of English origin were pure white, but large. Crossing the strains produced Cochin Bantams that were small and well formed, and at the same time perfectly white. Many excellent specimens are now shown, and it has been conceded that greater improvement has been made in this variety than in the original Buffs.

White Cochin Bantams make first-rate pets. They are small and docile and become very tame. The hens are splendid layers, and their eggs are surprisingly large when the size of the hen is considered.

LAND FRAUDS CHARGED

Oklahoma Indians Said to Have Been Cheated by Sales.

LOS ANGELES, July 4.—Charged in a Federal indictment, embracing 600 pages of printed matter, with using the mails to defraud in connection with the sale of Indian lands in Oklahoma, Homer C. Evans was held in $5000 bonds to await extradition proceedings to Cincinnati by United States Commissioner Long recently.

Evans was arrested here by Deputy United States Marshal Kavanaugh. He declared he would not resist removal proceedings, but would return to Cincinnati to clear himself of the charge.

More than 200 persons are named in the indictment as having been defrauded by the McAlester Real Estate Exchange of Oklahoma, a corporation claiming to represent outsiders in the purchase of valuable Choctaw and Chickasaw Indian lands. The alleged fraudulent activities of the corporation are said to have caused considerable unrest among the Indians, which resulted in a Government investigation and the arrest of its leading officers.

Among the 20 or more officials of the company under arrest in various parts of the country is Roy Van Cress, after whom the town of Van Cress, Okla., is named, which is termed the "Demonstration City" of the McAlester company.

The indictment stipulates that the McAlester company "has had no Government connections or special privileges," and that when lands were opened for settlement or for sale, this company sought to purchase the land for the account of its various clients and appropriated moneys sent it, whether the lands were available or not. Evans is specifically mentioned in the indictment as "an agent of the company."

The McAlester company is known throughout the United States as the "Oklahoma Land Cars," because of the unique manner in which it advertised Indian lands by means of exhibition cars.

OIL FILTER IS OFFERED

Minneapolis Man Would Aid Nation in War Against Huns.

MINNEAPOLIS, July 1.—John Gardner, 4145 Thirty-first avenue South, has offered to the United States and its allies, for the duration of the war, a perfected oil filter for automatic bolt machines, which, according to H. W. Libby, secretary of the Minnesota Public Safety Commission, will result in greater efficiency and speed in turning out war material.

The research bureau of the Safety Commission will make recommendations to the Government following a complete investigation of the device, the purpose of which is to filter the cooling oil from small particles of steel falling from the tools. Six of the oil filters are now in operation at a Minneapolis plant.

On June 13 a machine turned out 572 bolts before the filter was installed. After installing a filter a check was made on June 17, and the same machine turned out 830 bolts, an increase of 25 per cent.

"I stand ready at this time, as a loyal American, to permit the use of this device by the United States Government in all factories producing munitions of war, without compensation pertaining to patent rights," said Mr. Gardner. "This offer will be extended for the period of the war to the United States and to the governments of America's allies. If the Government wishes to compensate me, according to the merits of this invention, I will turn over half of the proceeds to the Red Cross."

Mr. Gardner is at present employed as an oiler at the Minneapolis Steel & Machinery Company's plant.

ALLEGED PLOT UNCOVERED

Pact to Slay Detroit Mayor Told Of by Chicago Woman.

CHICAGO, July 1.—Taking seriously a warning of a plot to assassinate Mayor Marx, of Detroit, the police department has detailed a guard of detectives to the city hall and others are scouring the city to find some trace of two men who were overheard detailing the plot.

Mrs. John L. Taylor, 143 Howard street, appeared at the city hall to report a conversation between two men she heard late in the night while waiting for a car at Jefferson and Chalmers avenues.

They spoke in broken English. One explained that in return for killing the Mayor he would receive $50 in cash and an automobile. The automobile, with the engine running, was to stand at the Griswold street entrance of the city hall and upon the assassin finishing his work was to carry him to safety and then become the slayer's property.

Just before the car came the men discovered Mrs. Taylor and seized her. By speaking French she convinced the men that she could not speak English and they allowed her to go.

Alaskan Indians Fight Famine.

DAWSON, Y. T., June 20.—Alaska Indians who wintered at Crow Lake, near Rampart House, a trail point in the Arctic Circle, fought against famine throughout the cold season, according to a letter received here. One Indian, his wife and 7-year-old daughter, kept themselves alive ten days by gnawing a caribou skin, which they soaked in water. For some reason the caribou, which usually run in large numbers in the North and upon which the Indians depend for subsistence during the Winter, migrated last Winter to some other section.