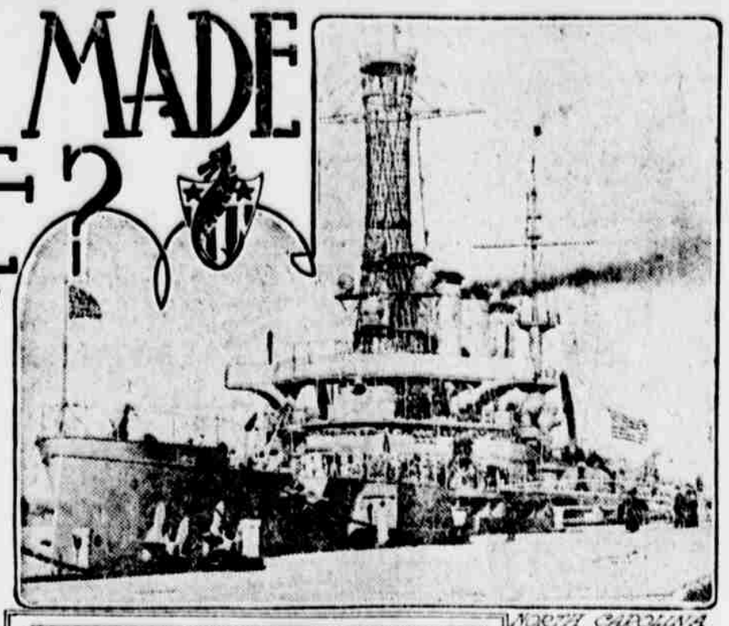
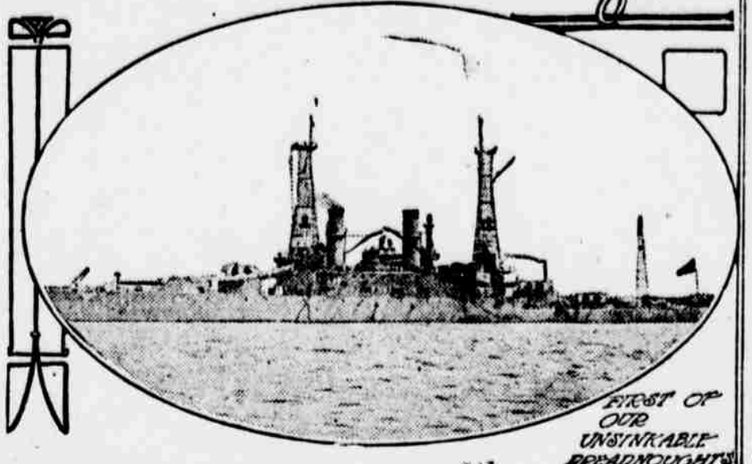
CAN A SHIP BE MADE UNSINKABLE?



NORTH CAROLINA WHICH WAS USED FOR EXPERIMENTS

IS it possible to make a ship unsinkable? At least, can't a craft be made far less likely to founder than under present systems of construction and yet be fit for the service for which she is designed? The sinking of the Titanic brought these questions before the public some months ago. Since then the skill of one man has developed a method which bids fair to add greatly to the margin of safety to any steel ship which may suffer serious damage below the waterline. The invention is a new application of principles which have been employed for other purposes for many years.

In 1908 the cruiser Yankee hit the Hen and Chickens reef, just outside of Newport. Various well-known salvage companies tackled the wreck, but abandoned the work, declaring that it was



FIRST OF OUR UNSINKABLE BREADNOUGHTS

DIAGRAM OF THE ANTI-FOUNDERING SYSTEM

quite impossible to refloat the cruiser. Then two young engineers, W. W. Wotherspoon and R. O. King, attacked the task along new lines, obtaining the financial assistance of the late John Arbuckle. These enthusiasts—for such was the spirit in which they approached what others had pronounced hopeless—broke away from traditional practice and resorted to the use of compressed air as a medium for salving the Yankee.

The ship had landed high on the reef, and the jagged rocks had torn her bottom plating in many places, making it impossible to pump her out in the usual way. These innovators sealed up the hatchways leading to the various holds. Then they pumped compressed air into the compartments, and the sea was driven out again through the rents by which it had entered. The ship was thus made buoyant enough to be dragged from the rocks. Unfortunately she was run into and sunk while being towed to harbor.

An entirely new problem then presented itself. Instead of making use of cumbersome pontoons and other external buoyant auxiliaries, Messrs. Wotherspoon and King settled upon the plan of turning the Yankee into her own salvage apparatus. In other words, it was decided to utilize the ship's own compartments as buoyancy chambers by draining them of the very water which had carried the craft to the bottom.

You will probably declare offhand that there is nothing original in this; anybody knows that a foundered vessel would rise if you could get the water out of her. But don't be too hasty in your conclusions. The difficulty lies in the danger that when the air has forced the water out, the pressure of the overlying water will crush the hull. How, then, did these young engineers guard against this danger?

They did not try to pump out the cruiser in the literal sense of the word; they drove the water out under the impulse of compressed air and they balanced the contending forces so nicely that the ship's structure was substantially a neutral division between them, the air pressure being just a trifle in excess of the pressure of the water which it forced outward from the buoyancy compartments. Do you realize the engineering cunning involved here? The compressed air actually constituted a stronger support for the burdened deck than the water which had previously filled the underlying space! As the cruiser rose to the surface the pressure was progressively reduced so that it just maintained an excess of force against the exterior water.

This method of floating the Yankee suggested to Mr. Wotherspoon a medium by which the structure of a vessel not yet sunk could be utilized to keep her afloat when otherwise inrushing water would certainly carry her to the bottom. Mr. Wotherspoon's first adaptation of this system was for naval purposes, to provide means by which an injured ship of war could survive the under water attack of either torpedoes or submarine mines, and probably be kept on an even keel so that she could still fire her guns effectively against an enemy.

From the keel of a fighting ship up to a height of several feet above the water line it is the practice to subdivide her as far as possible into a large number of separate water-tight compartments, the idea, of course, being to confine the area of injury. By making use of these compartments Mr. Wotherspoon's invention has robbed the under water weapons of much of their terror; it has reduced the dangers incident to hitting an uncharted rock; and it furnishes the commanding officer of a battle craft with a means by which he can assure himself at any time that his ship is structurally sound.

The naval constructor is a miser when it comes to apportioning pounds of a ship's displacement for auxiliary features. This attitude is really excusable, because stray pounds here and stray pounds there very soon reach the aggregate dignity of tons. When Mr. Wotherspoon submitted his proposition to the navy department the officials there grudgingly allowed him a very small total weight within which he was to make his system applicable to two-thirds of the 1,200 water-tight compartments of one of our armored cruisers.

On the face of it the prospect did not look encouraging, but it was right here that Mr. Wotherspoon's ingenuity met the difficulty. He chose to make use of existing facilities already provided for other purposes. This resourcefulness on his part enabled him, when his work of installation was finished, to surrender to the navy department a large percentage of the weight allowance originally granted him.

Take an empty tumbler, turn it bottom upward and press it down into a basin of water. The further you submerge it the smaller grows the air space, the air becoming more and more compressed. If you could slightly increase the pressure of the confined air the encroaching water would be driven outward. If the bottom of the tumbler were pierced, on the other hand, the air would escape and the water would rise and fill the space. Substitute a pipe instead of a free opening in the bottom of the glass and lead this pipe to a reservoir of compressed air. When this compressed air is poured into the tumbler the water will be driven out or the glass will rise and free itself of water. In either case then the space will be filled with air.

This is substantially what Mr. Wotherspoon has planned shall happen when a ship's compartment or compartments are flooded through under water damage of any sort. Air will displace the water due to leakage and make the craft float well nigh as if she had not been injured. Of course this is upon the assumption that the wound has occurred at the bottom and not the top of a watertight subdivision; otherwise the chamber will remain flooded.

But it takes a good deal of air to fill most of the big divisions of a fighting ship, and there must be piping to carry the air to these hundreds of separate chambers. How did Mr. Wotherspoon provide for all these and yet not exceed the weight allowed him by the naval officials? He did it by making use of facilities actually already provided for other services.

Foul air, gases and heat beyond a fixed degree must be guarded against in a man-of-war within the various under water compartments. To accomplish this end two pipes lead to each of these chambers, one to carry fresh air and the other to drain off the foul. Also every fighting ship is furnished with air compressors and there are a number of tanks in which this air is stored at a very high pressure. Normally this air is for the charging of the torpedoes, for some kind of mechanical work and for blowing the residual gases and bits of smoldering remnants of the powder bags out of the big guns before the breeches are opened for reloading. The very fundamentals of Mr. Wotherspoon's system were thus already installed and a few inexpensive connections alone were needful to complete his requirements. All that was necessary was to tap the air supply system by flexible hose and join the connection to the supply duct leading to any desired compartment, at the same time closing the exhaust vent. Thus compressed air under perfect control could be led into the flooded chamber and the water quickly expelled.

That is not all; the system makes it possible to enter the injured subdivision through a neighboring intact compartment for the purpose of effecting repairs. The workmen go into the connecting chamber, close it, and air is then admitted until the pressure equals that of the flanking damaged one. This done, the dividing door is opened and the workmen can proceed with their task.

Theoretically all the compartments of a fighting ship are supposed to be water-tight; practically some are not so. Here is where the safety system which Mr. Wotherspoon provides has another field of usefulness. Compressed air is very searching, much more so than water, and it has the added advantage of sounding an alarm wherever it manages to work its way through, even in a small measure. Dry air, unlike water, is not destructive, and a compartment full of stores, electrical apparatus of any other things sensitive to water could be flooded with compressed air for test without doing the least harm to the contents.

The value of this has already been proved in a number of instances recently and upon one occasion the draining of a leaking comparement and the charging with air of the surrounding compartments filled with stores resulted in the saving of probably $12,000 or $14,000 worth of property. In a few moments after the automatic alarm gave warning of the flooding the compressed air was in service and the water driven overboard again.

Perhaps the most striking example of the effectiveness of this system for keeping an injured ship afloat and making it possible for her to proceed to port was that of the U. S. S. collier Nero. The vessel struck Brenton's Reef, Rhode Island, in July of 1909. Ordinary salvage operations failed to dislodge her from the rocks, and it was not until certain of her decks were sealed hermetically and a number of the intervening spaces turned into closed compartments and compressed air pumped into her that she was released and floated. She reached the Brooklyn navy yard.

Difficult.

Representative Dudley M. Hughes of Georgia is called a farmer statesman and devotes much of his time to the agricultural interests of his district.

He has requests for many new kinds of seeds, and a time ago received this letter:

"Dear Dud:—Sam Yopp's been tellin' me of a new seedless tomatter the Guvment is growin'; I'm writing to you in hopes you will send me some of the seeds."—Saturday Evening Post.

An Exception.

"How did you find the roads up around Jingleville Corners?" asked Billkins of Slathersberry, who had just returned from a motor trip.

"Oh, I wasn't particularly stuck on them," said Slatherberry.

"Really?" said Billkins. "Well, I guess you're the only man that wasn't. I was stuck on 'em for a whole day last year."—Harper's Weekly.

All Needed Vacation.

Said Jones to the deacon: "I see you are going to give your minister a three-months vacation."

"We are," said the deacon to Jones.

"Isn't that a long time?"

"Maybe. But we need a rest, just as much as the preacher does."—Cleveland Plain Dealer.

Under Coat of London Soot

America was discovered all over again in London recently, says the Washington Star's correspondent. At least a long-hidden statue of America was. It is really no use putting up a statue or any other kind of memorial in London, for in a year or two unless seen to right along, it will be practically enveloped in a pitch black cloak of London soot, some 6,000 tons of which, according to an engineer's recent estimate, is always hanging in the atmosphere of this metropolis.

The statue of "America" which has just been discovered adorns the front of the Cannon street hotel, which adjoins one of the biggest of London's railway stations and is a favorite place for big political and other gatherings. It was put up in 1866, since when its walls have not been cleaned, hence for forty years or more all of the rather elaborate decorations which cover them have been hidden from sight as completely as if they never had existed. The pall of mingled soot and grime which covers them several inches deep in places, but it fall off almost at a touch, and after what is known as "wire brushing" the surface becomes fairly clean.

Four statues, it appears, representing the four continents, besides some balustrading and arching with decorative panels, compose the long-shrouded facade of the Cannon Street hotel. Of these statues, two, Europe and Asia, have now been brought completely to light, America has just been located and partly unveiled, and Africa, appropriately enough, is still the "dark" continent. Hearing of the discovery of America in Cannon street, the writer hastened to the spot, and after mounting to dizzy heights, by means of a ladder, and crawling along a stone ledge some eighty feet above the level of the ground, was rewarded with a sight of the partly exhumed statue, which stands some fifteen or sixteen feet high.

Remembering that this effigy of "America" was designated in the mid-Victorian period, it was no surprise to find it lacking in any special beauty. It is the figure of a woman—possibly a militant suffragette—holding in one hand a gun and in the other some ears of corn. On the ground is something which may represent either a tomahawk or the ax of the pioneer, and underneath, in letters that once were gilt, appears the word "America."

CARE OF SETTING HEN

Nothing Will Dislodge Perfectly Hard-Working Matron.

Box or Barrel Laid on Side, Painted Inside With Carbolineum or Some Other Good Lice Paint, Is Suitable Nest.

(By PROF. JOHN WILLARD BOLTE.)

A setting hen is a perfectly respectable hard working matron, suffering from an acute attack of spring fever. She will not work, she refuses to lay or even talk about it, and she develops a very crabbed disposition in a remarkably short length of time. Seeking out some chosen nest she takes possession, by force, if necessary, and proceeds to occupy it for about 23 hours and 25 minutes every day. She leaves it secretly and in silence, only when food is necessary. Having satisfied her wants, she suddenly remembers that unguarded nest, and makes for it with great speed and confusion.

It matters not whether the nest contains eggs or a doorknob, it is dear to her, and nothing will dislodge her. There she will hold the fort until her motherly longing is satisfied in a brood of little downy peepers. The writer once hatched three successive broods of chicks under the same hen, the hen setting for 75 consecutive days, and coming off the nest reluctantly and in good health at the end of that time.

The best way to detect a broody hen is to look through the nests after dark and see whether there are any hens on them. If so, they should either be brought up or placed on some worthless eggs in the hatching quarters, as they do harm in the regular laying pens by partially incubating eggs and fighting with all the other hens.

Almost any concave nest, well lined with hay, will do for setting a hen. Take a box, or barrel laid on its side, paint it inside with carbolineum or some other good lice paint, and form the nest out of earth with two inches of hay covering it.

Be sure to get the corners filled so that the eggs cannot roll into them. Have the edge of the box not over three inches higher than the eggs, so that the hen will not jump on them. Dust the hen with insect powder, place her on the nest on some dummy eggs, and cover her with another, ventilated box. Let her off in 24 hours, and if she goes back again, it will be safe to put good eggs under her.

Use an odd number of eggs, depending upon the size of the hen and the season. Thirteen in cold weather and 15 in warm, is about right for a Plymouth Rock hen.

Keep whole corn and pure water at hand and let the hen take care of herself. The chicks usually begin to hatch on the twenty-first day. Let them alone until the night of the twenty-second day. Then move her and the chicks to a warm, dry coop and do not feed the chicks until the twenty-fourth day.

It is a good plan to set two hens at the same time and give all of the chicks to one hen after they are hatched.

SHEEP HELP ON MANY FARMS

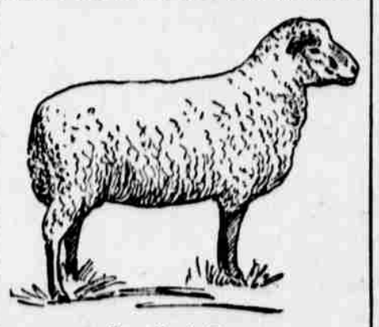
Besides Being Money-Makers, They Will Destroy Many Noxious Weeds—Range Bred Best.

(By W. A. LINKLATER, Oklahoma Experiment Station.)

It would add to the revenue of many farms if a flock of sheep were kept. Besides being profitable they are great weed eaters. They will eat five out of six of our known weeds, where a cow or horse will eat only one out of every six.

Range bred sheep are the right kind for the average farmer to buy. Such sheep will be grade Merinos and if they carry a cross of Shropshire, Lincoln or other mutton blood, so much the better. It would not be advisable to buy Mexican sheep or low grade sheep of any other kind.

The ewes purchased for the foundation flock should be good, large animals from one to four years old, and



Excellent Type.

weighing more than one hundred pounds. Where possible it would seldom be practical to start with less than 50 ewes, and a larger number would be better still. A flock of a dozen would require admost as much care as 50 or 100. These range bred grade Merinos should be bred to a Dorset ram if possible.

The reason we recommend buying range bred grade Merino ewes is that thousands of these are available, while Dorsets are not to be had in large numbers.

These fall or early winter lambs, by good feeding and care can be made to weigh 90 to 100 pounds by May 1, when they wil find a ready market and will always be in demand. Such lambs should bring from five dollars upward.

TO MAKE SWINE PROFITABLE

Beginner Will Do Well by Adopting One Breed, Standing by It and Work for Improvement.

With the number of excellent breeds of swine from which any one at the present day may make a choice it is a waste of time for a breeder to undertake to create a strain of his own by crossing the Chester White on the Poland China pig, although there are some instances where this has been done with pronounced success.

The beginner will do better by adopting one breed, standing by it and working for improvement in the family rather than in the race. A man with even limited capital may be able to get a good start by knowing what to purchase. Excellent young sows bred for fall or spring farrow can be bought for from $40 to $50, good male pigs for $25, or those old enough for service for $50, writes W. F. McSparran in the Country Gentleman. There is a question whether one need ever pay any more than these prices for some of the very best untried stock.

The animals should be fed well and wisely, as their subsequent improvement will result from feed, care and selection. The sow should produce two litters a year, about ten pigs the first year, although often she will do much better than that and sometimes

Decidedly Unprofitable.

not so well. If she is bred too young or is too fat at the time of breeding, the first litter, at least, will probably be small in number.

The breeder must know the type of animal he desires and select with that in view. If the offspring of a given sire have predominating characteristics of the kind approved, by all means breed this sire to his best daughters, and if his points of merit are prepotently fixed one can expect to secure the proper offspring.

Do not scoff at pedigree, for it means the record of the blood of your herd. Also, do not pay money for a pedigree, but spend it liberally for the ideal hog with a pedigree equal to his merits. There is abundant chance for selection from prolific swine. The young sow may farrow at from twelve to sixteen months of age. A mature sow should produce twelve to eighteen pigs a year, which will give you plenty of stock to select from.

NEED OF GOOD DAIRY SIRES

Cheapest Investment Farmer Can Make Is Purchase of Pure Bred Bull to Build Up Herd.

(By RAY P. SPEER, Minnesota College of Agriculture.)

It has been demonstrated again and again that the cheapest investmept that can be made by a farmer who is trying to build up the standard of a herd of cattle lies in the purchase of a good pure bred bull. It is not necessary to buy several high priced females as a basis for the average herd, nor is it economical.

A striking proof of this has been shown on the cattle show circuit at various state fairs last fall. One of many instances will suffice. Recently a prominent state fair judge had to choose between two cows with the same dam, but sired by different bulls, for the female championship of the breed. So strikingly similar in type was each of them to its own sire, though the dam was the same, that there was no trouble in distinguishing between the two. The one that had been produced by the more outstanding sire was so superior to the one that had been produced by the less superior bull that there was no trouble about the selection.

The principle illustrated is of practical value to the farmer who is thinking of beginning a herd with limited capital, or has a very common herd that he desires to grade up. An average group of calves will be far superior to their commonly bred mothers if a good pure bred bull is used. Such a bull can be purchased very reasonably if proper care is taken by the purchaser.

To Clean Hatching Eggs.

If eggs, while hatching, become soiled and it is necessary to clean them, a basin of warm water at a temperature of 103 degrees Fahrenheit should be used, but not above this, a little less being better than a greater degree. The eggs should be put into this water and the dirt gently removed after soaking and washing with the hands, then dried with a cloth and put back in the nest, which should be first renewed with clean hay. If not badly soiled they may be cleaned by gently scraping with a knife or with the fingers. Care is necessary to avoid cracking the shell or jarring the egg, as such an injury will destroy the possibility of a hatch.

Slow Turning of Separator.

Slow turning of the separator will lose more fat in the skimmilk than fast turning.

Place for Wood Ashes.

A good place for wood ashes is around the pear trees.