

THE MINE AND DEPTH CHARGE TROUBLESHOOTER

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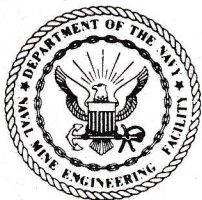


AN OFFICIAL NAVORD PUBLICATION

RADM MARK H. WOODS, USN
Commander, Naval Ordnance Systems Command

The Troubleshooter is an official NAVORD publication which disseminates informative articles pertaining to assembly, testing, safety, configuration, maintenance, and delivery of U. S. Naval mines and depth charges. When the word DIRECTIVE appears as a part of the mine heading of the article, the content that follows contains information requiring action that is mandatory and shall be acted upon promptly. The Troubleshooter issue is your authority for subh action.

Troubleshooter is also the journal for the Rudminde Program, a world-wide defect-reporting system, which promotes a high level of readiness in U.S. Naval mines and depth charges. Problems with these weapons are to be reported via NAVORD Form 8500/1 (2-68) to the Naval Mine Engineering Facility as directed by NAVORDINST 8500.3.



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THE MINE AND DEPTH CHARGE

TROUBLESHOOTER

ISSUE 4-69

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COVER

You are looking at a real ancient mariner on the cover of this issue of The Troubleshooter. What you see is what has been identified as the nose of a Mk 10 Mod 1 mine encrusted by coral and shell growth. Its three chemical horns are still identifiable. The mine was sand loaded. For story see page 3.

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FL SHOPTALK

NMEF FLEET LIAISON DESK • 703/887-2411 • AUTOVON 723-1900 • EXTENSIONS 492 & 695

FL Shoptalk is a column of observations general and specific, prepared by members of NAVMINENGRFAC's Fleet Liaison (FL) Department. Head of the department is LT Paul W. Hanks. Other members include LT M. D. Horn, Jr., LT R. L. Anderson, LTJG T. W. Mudd, and CWO B. E. Wharton.

OBSERVATIONS

According to the title of this column, it contains general and specific observations, prepared by members of NAVMINENGRFAC's Fleet Liaison Department. The following observations are based on recent journeys by members of the "Traveling FL Department," which included membership on Mine Readiness Inspection Teams and observation of Fleet Service Mine Tests, as well as other incidental travel.

BATTERY PACKAGING

There are indications that some of the overseas sites are still receiving batteries in large containers which are impossible to handle without a fork lift, not to mention stowage problems in the reefers. If you are one of the unfortunates that are receiving batteries in oversized containers, batteries packaged in quantities other than those specified by Table II on page 18 of OP 1452 VOL I REV 4, we want to hear from you. Specifically, we want to know the BA-numbers, differences in quantities from those designated, the depot that shipped them, and the applicable requisition numbers. The Mil-Specs under which our mine batteries are procured specify the quantities required per wooden shipping container, but apparently some are not packaged correctly. When NAVMINENGRFAC became aware of the situation, depots were directed to package in accordance with OP 1452 prior to shipment. In addition, all requisitions for batteries issued by us to depots contain the requirement that they be "packaged in accordance with OP 1452". So do yourself a good turn and help us try and prevent future oversize shipments by letting us know when you receive them in packaged quantities other than those specified. By the way, while we are talking about it, you can help the situation by not forgetting to order quantities figured to the nearest "unit package" as shown in Table II.

GROUNDING CRATED MINES

A question recently came up concerning grounding requirements for stacked crated service mines in the magazine. It seems that when someone took some ground readings from a crate in a stack to the grounded metal dunnage, which was connected to the secondary grounding system, they did not always get a low reading (10 ohms or less) and in fact were reading infinite resistance in some cases. When NAVORDSYSCOM HQ was queried about the matter, the reply was "resistance between primary and secondary lightning system shall not exceed 10 ohms in accordance with paragraph 12-4 - OP 5 VOL 1. Grounded material in magazines is not

considered as part of secondary ground system and therefore, does not enter into resistance measurements. Adequate grounding is achieved for lightning protection when secondary grounding system is connected to metallic materials with or without painted surfaces." This means that crated service mines stacked one upon the other are considered grounded providing your metal dunnage is connected to a secondary system that meets the required resistance readings. By the way, don't forget the ground strap from case to crate to complete the system. If anyone should ask you, the authority is NAVORDSYSCOM Unclas Message 272201Z of March 1970.

STANDARD FORMS

Keep your eyes open, standard test forms should be hitting the street anytime now, if in fact they are not already in your shop when you read this. Standard mine assembly checkoff sheets are on the way also, in pad form. All of which is part of a standardization effort which we believe will prove to be a good thing.

ABOUT THOSE JURY-RIGS

We think it goes without saying that you shop-types have come up with some good gadgets every good sailor calls a jury-rig. And in case you're wondering about the term (some of you 'ol timers already know), it comes from the days of sailing ships when sailors used to temporarily (or "jury") rig up a mast - which they called a "jury mast". Each and every clever idea some of you guys come up with has the merit of being made to aid in increasing efficiency or decreasing the workload of your particular organization. Every shop has a couple of these jury-rigs around - or else they're not doing much.

Most of these are part of the routine, however, rather than temporary. What we want you to do is make sure you're not creating one problem by alleviating another. It's great to come up with a labor-saving device peculiar to your own operation - but not if this device creates a dangerous situation by being a safety hazard. Be sure of them!!! Safety check those used where heavy weight lifting is concerned and if it is a modification or addition, etc. to an existing approved piece of handling equipment, don't forget to clear it through the appropriate authority, such as NAVORD, NAVAIR, etc. Have those electrical gadgets thoroughly checked out and inspected for possible shock hazard or possible damage to the equipment you use them on.

We receive reports of many good ideas back here at the Facility. Many of them have been published in THE

Continued on page 2

FL SHOPTALK

Continued from page 1

TROUBLESHOOTER as useful items which other shops might like to have. This is one of the areas we wrote about in our first SHOPTALK column - telling you we'd pass these ideas along. What you must realize is that many of these "gadgets" are useful only to certain shops and under certain conditions - and we do not advocate their use as mandatory in any way, shape or form. It amounts to a verbal and, usually, pictorial tale of how someone else is approaching a peculiar problem. In this way you receive a descriptive analysis of a possible method you can employ if you so desire.

Should one of these jury-rigs materialize into a method where much time and effort can be saved across the board, this will usually be picked up as a NAVMINENGRFAC maintenance and funding supported item the use of which will be mandatory for all shops. We guess this to be the time when the "jury" retires and the verdict is handed down as to nomenclature, MMC number, etc.

ADVANCE INFORMATION RELEASE

One of the mine assembly activities recently reported that they received a copy of a new revision to an OP (one copy only) and they wondered where the rest of the copies they required were. The explanation is that the one-copy release was inadvertently sent without being accompanied by the notice that reads like the one reproduced here, which explains all.

ADVANCE INFORMATION RELEASE

The attached publication(s) are supplied for the addressee's advance information, pending Fleet-wide distribution by the Naval Supply Depot, Philadelphia, Pennsylvania. Subsequent distribution will include the addressee's usual number of copies.

THE NAVAL MINE ENGINEERING FACILITY
YORKTOWN • VIRGINIA • 23491

Normally, then, you can expect to find this notice on all advance information released by NAVMINENGRFAC whether it is an OP, change, a Troubleshooter Bulletin, or whatever. Where it is an OP revision don't dispose of your existing stock until you receive your normal supply. When you do, follow the instructions in OP 3504 VOL 7 if the quantity doesn't meet your requirements.

TIMING OPERATIONAL TESTS

Did you ever wonder how critical the times are that you are told to wait between certain steps while conducting an operational test? Someone made the observation that the time should be verified with a stop watch. Not necessarily so - stop watches are identified, and their use specified, in all test procedures requiring a precise elapsed time period. Where watches are not specified precise timing is not critical and their use is not required. Your authority is Troubleshooter Bulletin No. 207.



In Troubleshooter 3-69 we listed the status of technical manuals in production at NAVMINENGRFAC. Here it is again, updated as of the time of this writing.

Recently Distributed

- OP 1811 REV 2, Mine Mk 50-0, Assembly
- OP 2608 VOL 1 PART 2 REV 1, Mine Mk 52/55-1 thru 6, Assembly Instructions
- OP 1452 Mine Components and Accessories:
 - VOL 3 REV 4 CH 1, Flight Gear, Accessories, Painting, etc. (This change adds completely new instructions on subassembly and overhaul of Float Mk 17 and associated components, the drill gear for all new air-laid drill-mine OAs. It will be referenced (rather than repeated) in all the new Mk 25, 36, and 52/55 assembly manuals.)
- OP 1798 REV 4, Mine Mk 36-2, Assembly (Look this one over carefully. . . it is the first of the new NMEF/NOL standardized mine assembly manuals, with some very good features.)

Released to Print

- OP 3504 Authorized Configuration Data for Under-water Mines:
 - VOL 7 REV 2, Deployment References
- OP 1892 REV 3, Mine Mk 36-2, Assembly
- OP 3388 Mine and Depth-Charge Test Sets: Qualification, Troubleshooting, & Repair
 - VOL 1 REV 1, Test Sets Mk 1 thru 126
 - VOL 2 REV 0, Test Sets Mk 127 thru 264
 - VOL 3 REV 0, Test Sets Mk 265 and above

In Final Preparation

- OP 3504 Authorized Configuration Data for Under-water Mines:
 - VOL 1 REV 3, Cross References
 - VOL 2 REV 3, Material Applications
 - VOL 3 REV 2, Piece Parts
 - VOL 4 REV 3, Bills of Material
 - VOL 5 REV 2, Test Equipment, Support Equipment and Tools
 - VOL 6 REV 0, Illustrated Parts Breakdown

In the Works (in approximate order of intended release)

- OP 1765 REV 4, Mine Mk 25-2, Assembly
- OP 1797 REV 4, Mine Mk 25-1, Assembly
- OP 3379 VOL 1 REV 1, Maintenance Guide, All Mines
- OP 3232 REV 0, Air-Laid Mines, Preparation
- OP 956 REV 5, Mine Mk 25-0, Assembly

* This report is designed to keep readers abreast of what is going on behind the scenes concerning technical manual projects. It is not designed to compete with OP 3504 VOL 7, which is the only list of technical manuals, revisions, and changes authorized for fleet use.

● OLD MAN OF THE SEA COMES BACK

The beaches of MAUI, Hawaii, appear to be becoming the lost and found department for the Pacific. Troubleshooter 1-69 carried a report of a Mk 57 test mine that alarmed a resident of KIHIE when it appeared off Kalama Park Beach. Now a Mk 10 Mod 1 mine comes ashore on a beach at LAHAINA on the western end of the island. It is an odd contrast in that the Mk 57 is the newest of the Navy's submarine-laid mines while the Mk 10 was one of the first to be designed for launch from a 21-inch torpedo tube. It had a short life being replaced by the Mk 10 Mod 3 in service.

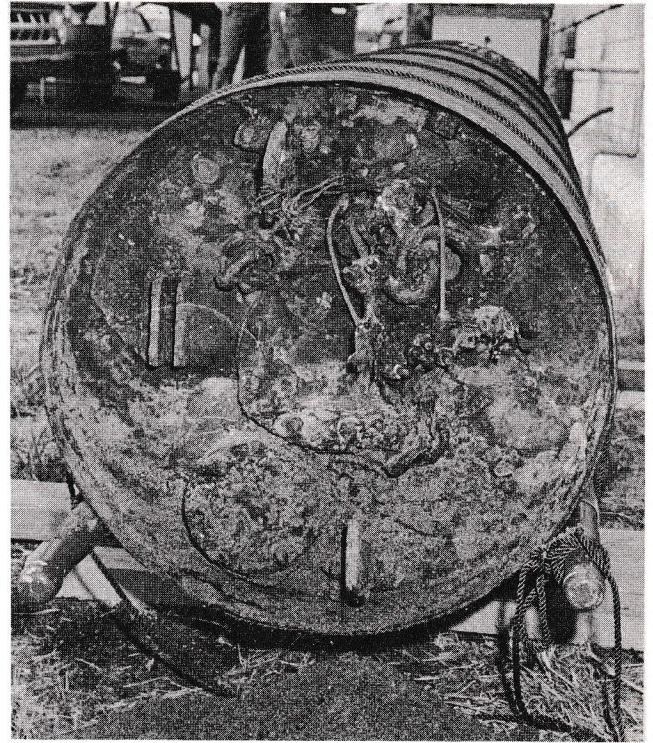
It was patrolman Sam Ellis of the Maui Police who reported finding "a cylindrical item 82 inches long, approximately two feet in diameter with three prongs on one end" on 19 February 1970. One day later a EODGRUPAC EOD team, WOIC. E. Wharton, MMI W. S. Smith, and AEANW. O. Lanman, arrived on the scene to investigate the object. It was a mine but the serial number of the case was obliterated by rust and corrosion, and the mine data plate was missing. A Hydrostat Mk 1, serial number 782, was found installed on the tail. Rusted and brittle fragments of mooring wire remained on the mooring bail. The mine was identified as a Mk 10 Mod 1. How long the mine had been under water is anybody's guess.

Upon disassembly of the mine, EOD personnel found the extender and booster-well empty; there was no wiring harness to the horns, and no glass vials of acid in the chemical horns. The explosive section was filled with damp sand. Gasket surfaces were clean and dry, the gaskets were in good shape and the bouyancy cavity was merely damp, apparently due to condensation. Despite being badly corroded the mine case was water tight.

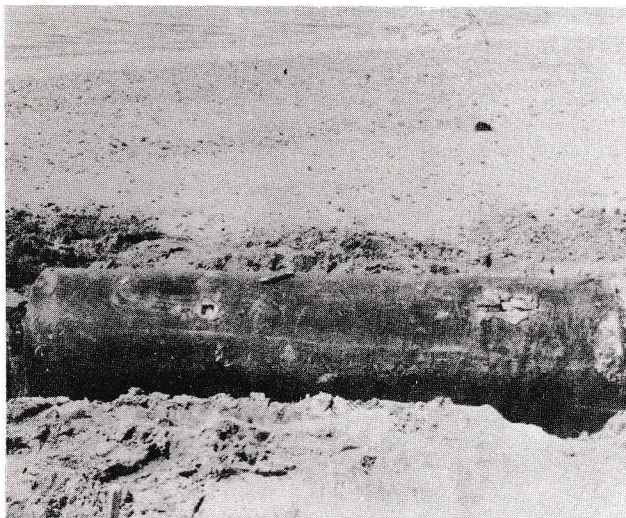
Although the mine apparently had been a dummy drill mine, a non-operating shape used to familiarize submarine personnel with service mine handling and planting

techniques, we can believe the statement made by an old publication whose description of the Mk 10 Mod 1 included: "It is equipped with electrochemical horns and is capable of an extremely long armed life."

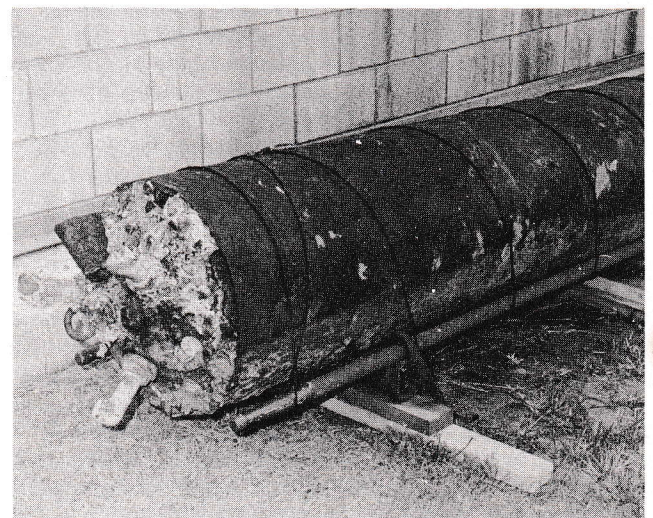
Our thanks to EODGRUPAC for the photo's and details.



The aft end of the old man of the sea whose nose with the horns is pictured on the cover. Remnants of the mooring line can be identified still clinging to a shackle on the badly encrusted Mk 10-1 case.



The "mysterious cylindrical object" is dug out of the sands of Maui beach by EOD team in order to establish its identity.



Identified as harmless the ancient Mine Mk 10 Mod 1 is returned to EODGRUPAC for disassembly and closer inspection.

TEST SET QUALIFICATION PROCEDURES RELAXED

Annual qualification of mine test equipment which has been stored unused is no longer required. But before use, if a year has elapsed since calibration or qualification, it must be re-qualified.

Mandatory qualification of test equipment after issue or shipment has also been dropped as a requirement.

These relaxations in the Master Work Plan for Mine Test Sets is documented by Change 1 to OP 3379 VOL 2 REV 1, dated 15 April 1970.

It is still required that test equipment be qualified after shipment if it shows evidence of rough handling and damage that makes its proper operation questionable in the opinion of the mines officer. It is also still required that the equipment, before use, be returned to a Navy Calibration Lab whenever five years have elapsed since it was last calibrated.

MISSING SET SCREW

MINE MK 57-0:

DIRECTIVE

When installing the Explosive Fitting Mk 9 in the head of the mud agitator on the Anchor Mk 57 you need a set screw, socket head, 10-32 by 1/4 inch long to hold the explosive fitting in place and properly oriented.

If everything is as it should be the set screw will be supplied with the Mud Agitator Mk 1 Mod 1 in which case you have nothing to worry about. On the other hand reports by the Rudminde indicate that some 10 per cent of the mud agitators turn up without the set screw, either not supplied at all or lost in handling.

Determine that the set screw is present at the time of the next maintenance cycle or upon assembly of the mud agitator head for anchors designed for use on the Mine Mk 57 Mod 0, OA 04. If it is not present replace it with OA76016, MS 51874-35, 5305-716-7998. While you are about it order some extras.

You should find the set screw in a bag in a fiber-board box in which miscellaneous parts for the mud agitator are stored before assembly. When installing the set screw to hold the Explosive Fitting Mk 9 in place remember to align the countersunk hole in the fitting with the set-screw hole before screwing it down. No appreciable torque need be applied.

4

TRIM TEST POT'S ROD AGAIN

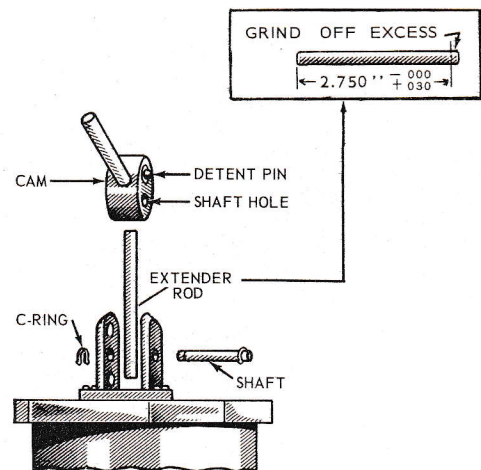
MINES MK 52/55-1,2,3,4,5,6:

The length of the rod that operates the bellows in the Test Pot Mk 6 Mod 0 is causing trouble again. Originally, by Troubleshooter 3-65 Job Right, it was shortened to 3.125 inches to avoid interference with the diaphragm covers of the Pressure Detectors Mk 1 Mod 0 during Class C testing of Mines Mk 52/55 Mods 3, 4, and 6. This corrected the interference problem but now the design limits of the test pot's bellows enter the picture.

It has been determined that either the original length or the 3.125 length rod forces the bellows to operate outside its design limits to the detriment of the bellows. The answer is to dismantle the pressure pots (four of them come with Test Set 263 in Accessory Set Mk 10) and cut the rod to a length of $2.750 \pm_{0.030}^{0.000}$ inches. The length is critical so grind off the excess on the square end of the rod. Check with calipers for accuracy. No minus tolerance is allowed because bellows is operating to within .003 inch of maximum compressed length when the rod is cut to 2.750 inch. Further reduction in rod length may exceed bellows design tolerance.

Upon completion of the rod-shortening job, stencil, rubberstamp, or otherwise mark the side of the test pot 2.750-INCH ROD INSTALLED.

Continue the practice of always being sure the cam lever is turned to its "signal" (retracted) position when you mount a test pot over the detector. If you don't and, through some oversight, one of the longer rods is present you will likely damage the diaphragm cover on the pressure detector. Just good insurance, since when you turn the cam to the "hold" position any undue resistance will warn of interference.

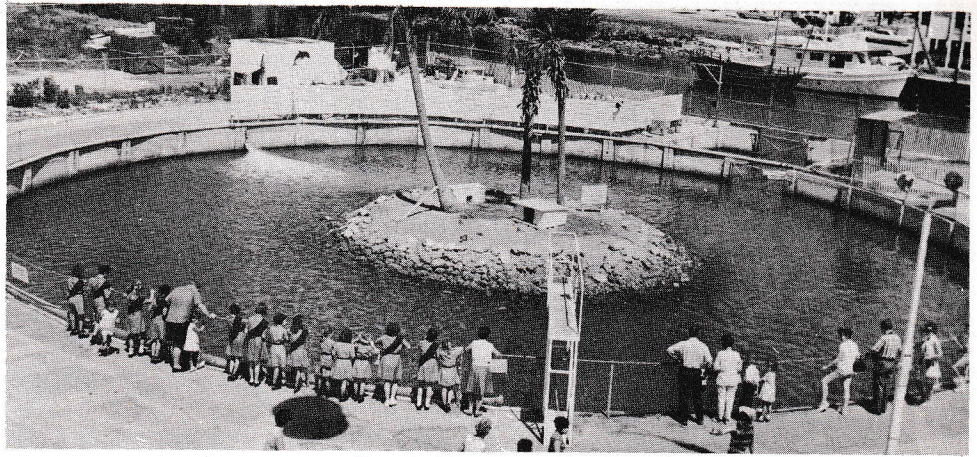


Disassembled Test Pot Mk 6-0

To disassemble remove C-ring from gauge end of shaft and withdraw shaft. Lift out cam, making sure you don't lose spring-loaded detent pin which falls out easily. Shake out bellows-extender rod. Reverse procedure to reassemble.

TROUBLESHOOTER 4-69

FIBERGLASS MOORING CABLES TASTE GOOD!



The shark moat at Ocean World in which samples of fiber glass mooring lines are placed in an effort to identify the marine creatures that have been biting them.

PROSPECTS for success were bright for the engineers at the Naval Ordnance Laboratory, White Oak: Structures Division, Underwater Mechanical Engineering Department, had been working on fiber glass mooring lines for some time. Then tests at the NOL Test Facility in Fort Lauderdale, Florida demonstrated real advantages of fiber glass over steel cables for mooring mines.

The primary advantage of fiber glass lines is that they weigh only an eighth as much as steel cables of comparable strength. This could let today's underwater ordnance be used in deeper waters. New designs could be made smaller and more effective for their size. Fiber glass lines are also less conducive to the phenomenon known as dip. They are superbly resistant to electrolytic action in sea water. They are non-magnetic.

Yet with all these goodies the fiber glass lines posed a real problem: according to NOL's monthly Oak Leaf they kept parting and no one could figure out why. The stresses they were subjected to were theoretically well within their capabilities. And careful laboratory simulations of the field tests failed to reproduce anything like the ragged breaks of the recovered samples!

Was something cutting the lines? If so, what? The breaks were too irregular to indicate they were man-made. If they were made by sea creatures, what kind and why? No one at NOL knew enough about marine life to answer, so Charles Napple, NOL Structures Division's lead technician on the project, suggested they expose samples of

the mooring lines to various marine creatures under realistic but closely controlled conditions.

Napple called Asa Reece, an engineer at NOL's Fort Lauderdale, Florida Test Facility. Reece found out that a Facility technician, Bob Redmon, knew Paul Hirschman, curator at the famous Fort Lauderdale Porpoise Show and Oceanarium, Ocean World. After an explanation of the problem Hirschman agreed to place samples of the fiber glass lines in Ocean World's shark moat, a circular tank containing sharks, turtles, and compatible species of fish, into which new sea water is continuously pumped.

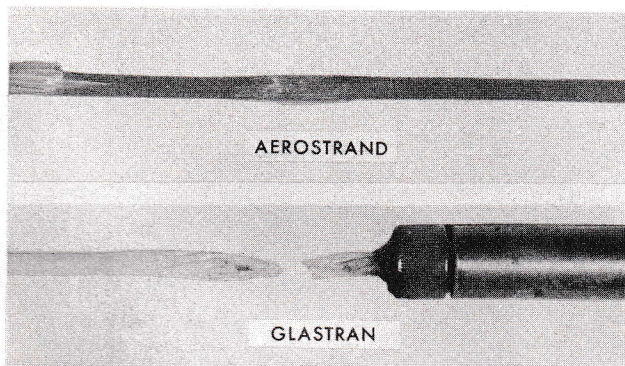
Hirschman theorized that large sea turtles could be causing the problem . . . that jellyfish, the sea turtles' favorite food, could become tangled on the lines, and that turtles could then shear the lines while eating the jellyfish. He added that Ocean World had had to bury electrical cables in tanks in which they had turtles, or else the turtles would cut them. Sample lengths of NOL's fiber glass line were placed in the moat and checked for damage at regular intervals. Results were soon in coming.

One sample was bent to retain a fish strung on it as bait, then placed in front of a turtle. The turtle ate the fish, then took several bites at the line, making deep cuts in it. Another sample was suspended in the shark moat for several days. When recovered it was broken at its lower end and had a deep slice at the top end next to the metal fitting by which it was lowered into the moat . . . a cut that parted during retrieval.

The evidence isn't conclusive, although Hirschman is sure the cuts are turtle bites. The sharks remained indifferent to all sample lines. Only the turtles consistently attacked them, and left marks like those on the samples that had parted in NOL's field tests. Although tests continue at Ocean World, NOL is now all but certain that sea turtles are the villains.

So where now? The next step will probably be to find or develop an organic or chemical repelling agent that will offend the taste or sensibilities of turtles. Or there may be a way to disguise the lines so that they either scare, or do not attract turtles.

In any case, predicts the Oak Leaf, now that NOL engineers know what the problem is, its solution won't be long in coming.



Samples of fiber glass mooring lines taken from Ocean World Shark moat. Aerostrand fiber strand (top) was chafed by unidentified inmates of the moat. A turtle probably cut through the Glastran sample (bottom).

HOT STUFF

by B. Arnaclebutt, MNC

New hose for old

MINES MK 52/55-1,2,3,4,5,6:

Dear B. Arnacle:

We have Accessory Set Mk 10, Test Set 263, which includes air pumps with bad hoses. A new length of hose would put the pumps back in use if we could get the right hose.

MN2 NNH

Dear NNH:

The answer to your problem is synthetic rubber hose, .125-inch ID, 1000-PSI Test. FSN 4720-189-9716 will get you a 50-foot length of this replacement at a cost of 2 cents per foot.

B. Arnaclebutt

Hoisting lug bug

MINE CASES MK 25-1/36-2/50-0/52-0:

Dear B. Butt:

What is the true story on the use of hoisting lugs on mines? Some drawings still show these lugs but OP 3504 does not list them.

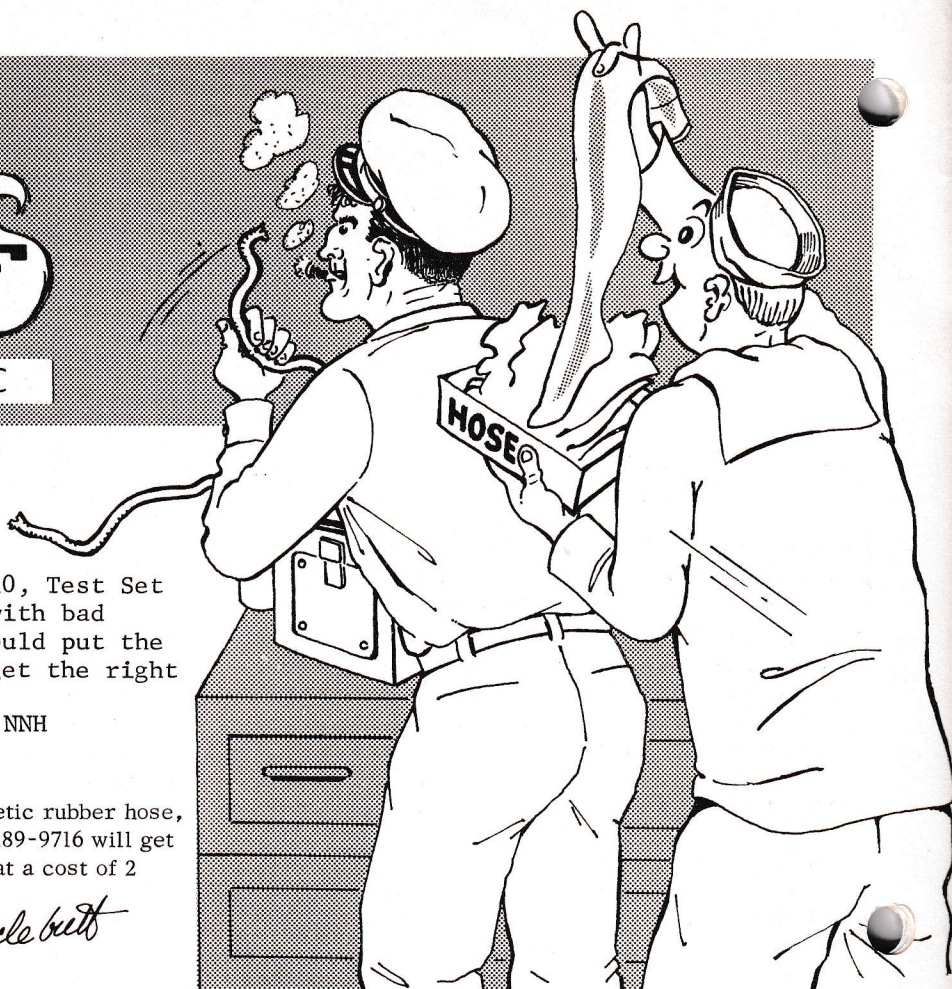
WAL

Dear WAL:

Don't let those hoisting lugs on drawings bug you but believe OP 3504, the fleet's authorized source of information. Volume 4 gives the true story of what is needed to assemble a mine and assembly manuals tell you how to do it. Hoisting lugs were eliminated back in 1962.

Drawings are for manufacture of hardware and are seldom updated for minor changes except when procurement is imminent. So use documents listed in OP 3504 Vol 7 for all prescribed and authorized work at organizational, intermediate, and depot levels. This eliminates field problems with design and procurement documents.

B. Arnaclebutt



FSNS for replacement packing

MINES MK 56/57:

Dear B:

Obtaining correct FSNS for replacement of preformed packing for Accessory Set Mk 13 Mod 0 used with the Mk 250 Test Set has caused some trouble. Here is a list that may help others with the same problem if the list is correct.

MS 29513-10	9Z5330-248-3835	\$0.04
MS 29513-250	9Z5330-291-3035	.37
MS 29513-260	9Z5330-252-6041	.48
MS 29513-251	9Z5330-599-3071	.25
MS 29513-228	9Z5330-291-7337	.08

MN2 FLC

Dear FLC:

The list is correct and thank you for thinking of others who may face the same problem. They will thank you too. This information will appear in OP 3504, Vols 1 and 5, under MMCs 4A12012 through 4A12016.

B. Arnaclebutt

Problems with Mk 12 lugs

MINES MK 25/39:

DIRECTIVE

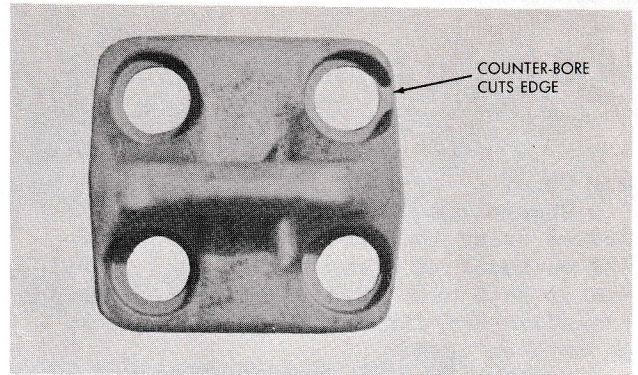
Dear B. Arnacle:

We have been receiving Suspension Lugs Mk 12 Mod 0 with a variety of defects. Some have missing mounting-hole counterbores while others have counterbores that break through the outer edge of the lug body. Another with an oversized cross bar was placed in Code H. What disposition do we make of the others?

MN2 DSL

Dear DSL:

You did right to discard the lug with an oversized cross bar. Any cross bar thicker, fore and aft, than .490 inches just will not mate with all Mk 8 bomb shackles. When you use the gauging method described in the article on page 7 of the 1-67 Troubleshooter, keep in mind that the shackle you use should be on the minus side of the .010 tolerance allowed, otherwise the shackle could "pass" a .510-inch-thick lug in extreme cases. If screening unmounted lugs use a caliper, micrometer, 0 to 1 inch, 7C00006 set at .490 inches. The tool should not bind at any spot as it is moved across the lug.



These are interim methods to be used while a proposal for the design of a gauging tool to do the job is being studied.

Discard any lug with a missing counterbore; but those lugs that have counterbores that touch the edge of the Mk 12 lug base can be used with safety and are serviceable. An example of this condition is pictured here thanks to MNI J. J. Sbei, Iwakuni, who had the same problem and sent us the photograph.

B. Arnacle

CA-1832s with a twist

MINES MK 52/55-2:

DIRECTIVE

Dear Hot Stuff:

Some of our Instrument Cables CA-1832 have power plugs that are 180 degrees out so that when assembling Mines Mk 52/55 Mod 2 it is necessary to twist the flat of the cable to get the plug P6 oriented properly. The twist takes up too much room to fit into the space between instrument rack and tail cover in the Mine Mk 52 but will squeeze into the space in a Mk 55. If it fits, is it all right for the cable to have a kink in it? How did such a mix-up occur?

MN2 TIC

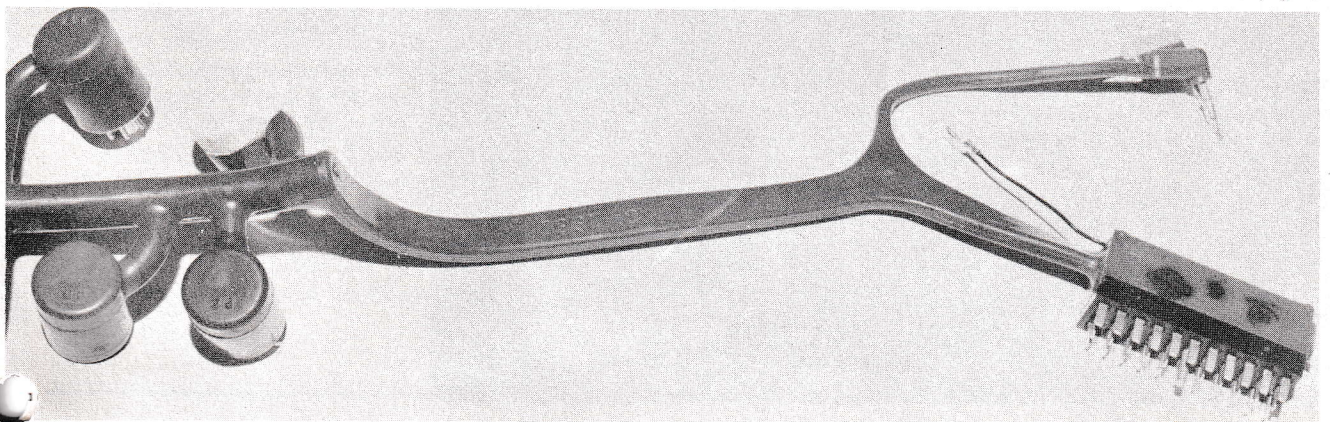
Dear TIC:

If the reversed-plug cable can make it in the Mine Mk 55 Mod 2 it should work as well with the twist as without it. It would be a good idea to examine your Mine Mk 52 stock of spares for odd-ball CA-1832s. These should either be swapped with cables for Mines Mk 55-2 and so designated, or replaced. If the plug doesn't lay-out like the one pictured here, it is reversed.

My guess as to how all this happened is that the manufacturer got a faulty mold in his production line. Since manufacturers work with five or six molds for any one cable, probably one in every five or six cables will show this defect.

B. Arnacle

Continued on page 8



Mk 6 lug in triplicate

MINES MK 36-1,2,3 (DRILL)/52-1,2,3,4,5,6:

DIRECTIVE

Dear Chief:

When we requisitioned Mk 6 lugs OC20208 using the stock number 1325-580-1120 we received a mixture of lugs identified as Mk 6 and MAU76/A. The two types look alike and fit the Mk 36 strongback. Can both be used?

MN1 SLR

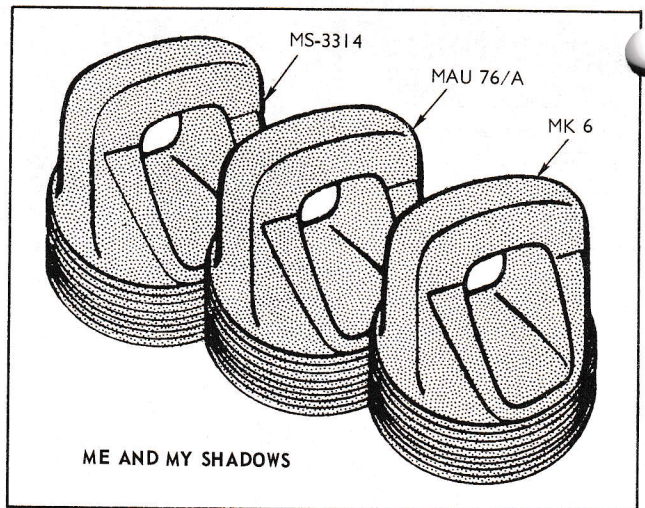
Dear SLR:

They should look alike because they are, for all intents and purposes, identical and interchangeable. Use one as you would the other. The story is this:

The Air Force and Navy have been carrying identical lugs under different drawing numbers and designations for some time. Now stocks have been pooled and have received a common designation MS-3314. Although lugs Mk 6 and MAU76/A on paper are considered obsolete you will still receive them until stocks are depleted, after which the same lug will turn up as MS-3314. Any of the three lugs can be accepted as standard.

Redesignation as Lug MS-3314 as standard, with a new stock number, will be reflected in later revisions of OP 3504. Regardless of this upcoming change there is no need to order replacements to change serviceable lugs now installed on drill mines Mk 36 Mods 1, 2, 3 or service and drill mines Mk 52 Mods 1 thru 6.

B. Amaclebutt



5-0 Arming wire scrapped

MINE MK 57:

DIRECTIVE

Dear Chief:

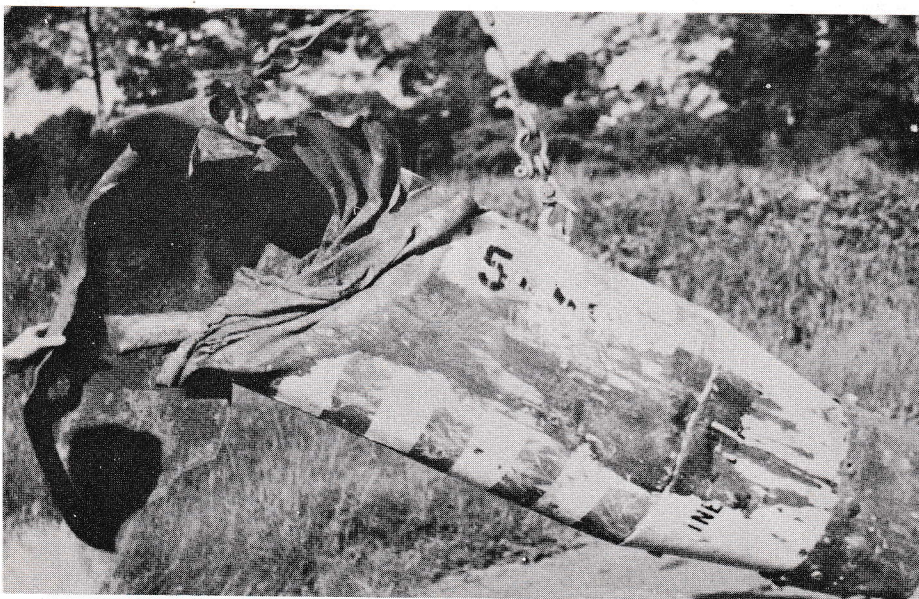
We have a stock of Arming Wires Mk 5 Mod 0. Now we get Mk 5-1s. Can the Mod 0s be salvaged or considered limited standards?

SAV

Dear SAV:

No, the material in the Mod 0 wire is not acceptable. Scrap them and use only the Mk 5 Mod 1 wire.

B. Amaclebutt



WHEN THEY HIT THE BEACH

Here is a horrible example of what can happen to a Mk 25 drill mine when it is "planted" twenty feet up on the beach. MNC Robert N. Hart of Subic Bay, where it all started, reports the parapacks operated according to the book but parachute or no parachute it sure hit hard. Write off one mine every time.

Our thanks to Chief Bob Hart for sending along this photo to share with our readers and to the photo lab at Cubi Point for taking it.

Do You do this Job Right?

PROTECTING THE FIRE RECORDER

Mine Fire Recorders Mk 17 have been taking a beating from the ricocheting cutter expelled by the Type B Switching Device upon actuation of FSMT Mk 52/55 mines. This effectively stops the clock but its getting too expensive. From now on install a rubber cushion in the arming device well whenever the Type B Switching Device is used. Here is the tested and approved method for doing the job.

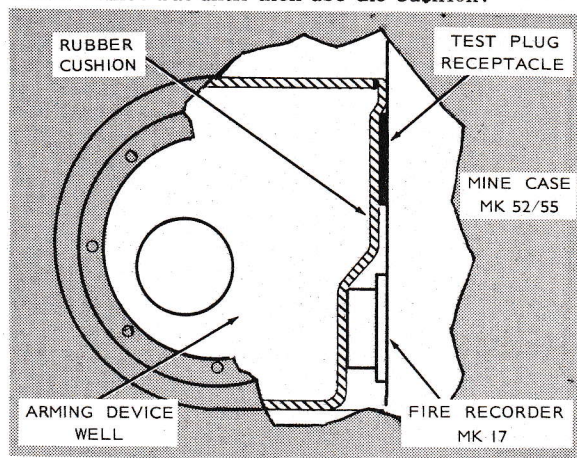
Make the cushion by cutting 4-inch strips 24 3/4 inches long, from MIL-R-6130 Type 1 Grade A Rubber Sheet FSN 9G 9320-232-2453 5/8-inch thick. You can get eleven cushions out on one 36" x 36" sheet. Now, to get it into the well:

- ▶ Verify that recorder is running and that dial readings have been properly entered on Fire Recorder Readout Tag.
- ▶ Coil rubber strip so that it will enter well easily. Hold arming device and cables aside and insert coiled cushion.
- ▶ Uncoil rubber strip in a counterclockwise direction, starting in corner nearest test plug receptacle, (starting end of cushion must be tight against bulkhead). Fit it snugly around the wall of the well,

except in the corner where it covers and protects the recorder.

- ▶ Place arming device in well with switching device cable and CA-1832 passing over the cushion, and continue with FSMT mine assembly procedures.

Eventually the Type B device will be replaced by a cutter similar to the Type F device used in 56/57 FSMT mines but until then use the cushion.



REPACKAGING EXPLOSIVE FITTING MK 18

In converting Mines Mk 52/55 Mods 1 thru 6 from Configuration A, B, or C to D it is not only necessary to remove the Arming Device Mk 5 but also to remove the Explosive Fitting Mk 18 Mod 0 from the arming device. When this is necessary repackaging of the explosive fitting is required and will be accomplished in this manner:

- ▶ Wrap explosive fitting in Kraft paper, 7P00073 and secure with 1-inch masking tape, 7T00079.
- ▶ Over-wrap with cushioning material, 7C00127 and again secure with 1-inch masking tape.
- ▶ Place wrapped and cushioned explosive fitting into snug-fitting bag made of barrier material 7B00004.
- ▶ Expel air from bag and heat seal.
- ▶ Stencil, stamp, or mark each bag as follows:

NAVORDSYSCOM

6T 1351-895-7025

1 ea. Fitting, Explosive Mk 18 Mod 0

100001-2033020

Level A/-

Date _____

MFR _____

Contract No. _____

When packing a number of these bags use suitable ammunition can. Cushion so contents are protected and held firmly. Stencil container same as above except for quantity (a variable) and level, which shall be designated A/A. Add gross weight and cube of container.

The Editor

MINES, MINEMEN & MEMORABILIA

HISTORICAL SERIES # 2

THE LEAN YEARS

Despite the lessons of the Civil War the development of mine warfare received little attention in the years before World War I by the United States; but, Germany, Russia, and Japan were very active in developing underwater mining. Defensive mine fields were laid in the Franco-Prussian War and the Crimean War, but it was not until 1904, in the Russo-Japanese War, that attention was called to mines as a weapon in offensive naval warfare. Both Russian and Japanese Navies were well equipped with effective mines of that era and facilities for laying them. Both sides used them extensively, as offensive weapons early in the war.

One example of such use was when a mine field was laid just outside of Port Arthur and a day later a small Japanese decoy squadron lured a part of the Russian Fleet out of its port and to a location where it would probably pass over the minefield on its way back to port. A larger Japanese fleet then appeared on the scene and the Russians, not prepared to battle a large fleet, withdrew to Port Arthur and passed directly over the minefields. Two large battleships struck mines. One was sunk with heavy loss of life, while the other was severely damaged but succeeded in reaching port. Both Russia and Japan lost ships to mines, in all three battleships, five cruisers, four destroyers, two torpedo boats, one minelayer, and one gunboat, while others were severely damaged. A pretty good score, even by today's standards!

The United States Navy's interest in mining in the 1880's was toward the utilization of the "defense mine", and the statement that naval defense mines had been designed by 1889 first appeared in "Excerpts of Bureau of Ordnance Reports" of that period. Be that as it may the responsibility for controlled mines was given the Army Engineers by Congress in 1891.

There is no record of mines being used in the Spanish-American War except in the isolated instance of the loss of the USS Maine concerning which historians debate if credit for the sinking should be given to a limpet-type mine or not--and who or what exploded it. U.S. Army Engineers made some attempts to install a controlled mine defense of New York's harbor in 1898 but the effort was not successful. This poor performance apparently led to an expansion of the experimental controlled mine field in the Potomac at Ft. Washington, now a national park.

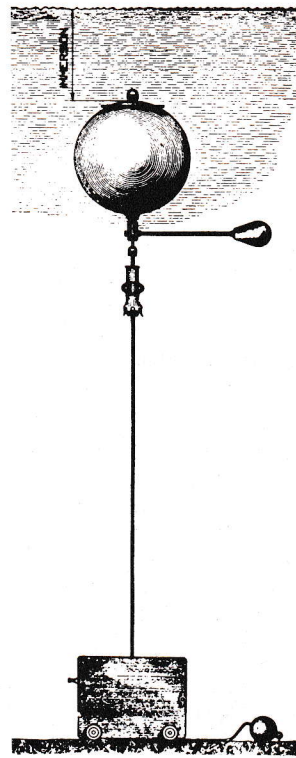
In 1906 and again in 1912 the mining for controlled mines was brought up to date but there was no training program or practice for mining forces, so by 1917 stock material was again old and unserviceable and know-how was lost. No controlled mine fields were planted in World War I.

In 1892 the Bureau of Ordnance Annual Report refers to the Naval Torpedo Station, Newport, as continuing its work on mines and, in 1898, that "gun cotton mines and mining outfits (were) prepared and issued". There is no record of any of these mines being used.

Interest in naval mines grew, however slowly, and shortly after the turn of the century Congress was asked for a "Mine Depot Ship". A small experimental vessel was assigned to the Torpedo Station

and by 1912 the Navy's first minelayer, the USS San Francisco, was supplied with a "war allowance" of mining material. A second minelayer, the USS Baltimore, was fitted out in 1912. In 1915 a full-time mining officer was made part of the Bureau's staff but not for long. In 1916 more urgent problems developed and the officer was assigned to other duties.

Bureau of Ordnance report excerpts during a 10 to 15 year period indicate that each Chief of Ordnance was reporting the mine program as moving along satisfactorily but it appears that it wasn't moving in the right direction, for in 1917 the U.S. situation for "automatic mines" was stated officially by the Bureau of Ordnance as unsatisfactory. At the outbreak of World War I, Great Britain had about 4000 of the so-called Navy Spherical Mines; but she still depended almost entirely on her fleet. At that time the United States relied on foreign designs of the moored mine with an automatic anchor that payed out mooring cable to a predetermined length much like the anchor of the Mine Mk 6 of today.



NAVAL DEFENSE MINE MK 3
The mine, shown here moored, is described in a 1916 Bureau of Ordnance pamphlet. The mine carried a long lever with a cork float at its end. Upon contact with a ship it was expected that relative rotation between case and lever would cause the case to rise an inch or two. This would compress the firing spring and then release it against the detonator.

The U.S. Naval Defense Mine Mk 1 was a spherical mine similar to a controlled mine but with an inertia firing device. The Naval Defense Mine Mk 2 was of French manufacture and about 1915 the navy began manufacture of the Naval Defense Mine Mk 3 based on an English design for which a royalty was paid the Vickers Company. By 1917 a few thousand mines were in stock and approximately 140 per month were being manufactured, all of a design which the British had discovered were not too satisfactory during the first years of World War I.

The strange circumstance is that 1917 found the United States in much the same position in relation to mine warfare as it was at the conclusion of the Civil War although it was American ingenuity that was largely responsible for the pioneer development of the mine as a weapon. That the Union Navy had lost many vessels to the Confederate "torpedoes" was a lesson unlearned. All this was about to change when the United States entered the first world war in 1917, due largely to another underwater "devilish device", the submarine. How it changed will be the subject of the next of this series.