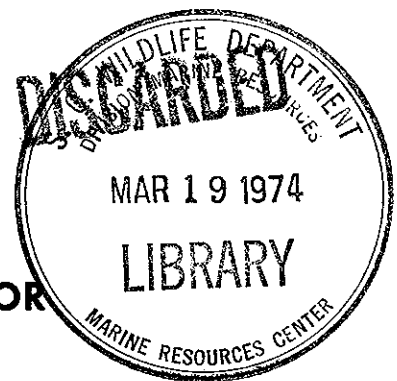


Construction and Operation of Lobster Fishing Gear

7.L. 64

V. G. BURRELL, JR.

**UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES**



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Fishery Leaflet 64

CONSTRUCTION AND OPERATION OF LOBSTER FISHING GEAR

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Illustrated by Boris O. Knake**

Contents

	page		page
Hoop-net	1	Buoys	9
Half-round lobster pot...	2	Bait	10
Rectangular lobster pot..	5	Fishing methods	13
Funnels	6	Regulations	14

Hoop-net

The early gear used to catch lobsters on the northeast coast of the United States was the hoop-net. This was made by fastening webbing to a hoop about 36 inches in diameter so as to form a bag approximately 18 inches deep. A rigid cross bridle was fixed to the hoop, and at the center of the bridle the hauling line was fastened. The bait was suspended from this same point.

As the lobsters were free to leave, the net had to be tended constantly. To lessen the amount of attention required, the fishermen soon devised traps that allowed the lobsters to enter but prevented their escape.

Being home made, these traps or pots were fashioned from many different materials and varied greatly in both size and design. However, the lobstermen have gradually settled on two types of pots as most satisfactory, the semicylindrical, or "half-round," and the rectangular. The construction of these is now more or less standardized except for minor variations in the size of the trap and the number of entrances. In certain fishing localities small lumber mills furnish materials cut to the lobstermen's specifications. Thoroughly seasoned oak, spruce, and hemlock are favored for lobster pot construction.

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Half-Round Lobster Pot

The semicylindrical lobster pot found its first extensive use in Maine and, although made with varying dimensions and construction, is still the most popular trap in that State as well as in some other areas along the coast. Figures 1 and 2 illustrate the construction of a typical trap.

The base is about 32" long by 27" wide; the height is about 18", all outside measurements. Each pot requires three bows. The bow is made from a board 47" long x 1-1/8" wide x 1/2" thick. Each end of this board is turned or whittled to form a cylindrical pin 2" long x 1/2" diameter. Three sills are made from boards 27" long x 1-1/2" wide x 1" thick. Two holes, 1/2" in diameter, are drilled through each sill, centered 2-1/2" from each end.

The board for the bow is steamed and bent to form a U, and the cylindrical ends are inserted into the holes in the sill so that the pins project 1" beyond the sill.

To complete the frame of the pot, two runners are made from boards 32" long x 1-1/2" wide x 1" thick. Each runner is drilled with three holes 1/2" in diameter to receive the projecting pins of the bows. Two of the holes are centered 3/4" from each end of the runner; the third is centered 15-1/4" from one end. The three bow and sill sets are then fastened to the runners by having each pair of projecting pins of the bows slipped into the corresponding holes in the two runners. Galvanized nails are driven through the sills and runners into the pins of the bows in order to secure the joints.

Common building laths, usually about 1-1/8" wide x 3/8" thick, are nailed to the sills, bows, and ends, except where the door and the entrance funnels are to be installed. The laths are spaced approximately the width of a lath apart. Some States require that the first side lath be at least 1-1/2" above the floor of the trap to aid the escape of undersized lobsters. The door to permit access into the pot is made of three laths fastened to three cleats of the correct curvature. Hinges formed from leather or rubber straps hold the door in a longitudinal position across the pot near the top of the bows.

The bows now divide the trap into two sections. The shorter section is called the chamber. The lobster, seeking the bait, enters the chamber section first, and then crawls into the larger section, or parlor, where it is trapped.

The chamber, or shorter section, is usually provided with an entrance on each side. The openings start about 2 1/2 inches above the floor of the pot, and are about 8" high x 13" long. Each is provided with netting to form a funnel about 7" deep which ends in a ring 4" to 6" in diameter. Two or three brace lines tied between the two rings draw the netting taut to form two rigid funnels. The inner funnel or "long head" is then lashed or nailed to the middle bow and tied into position. The bait hook or bait bag cleat is also fastened to the

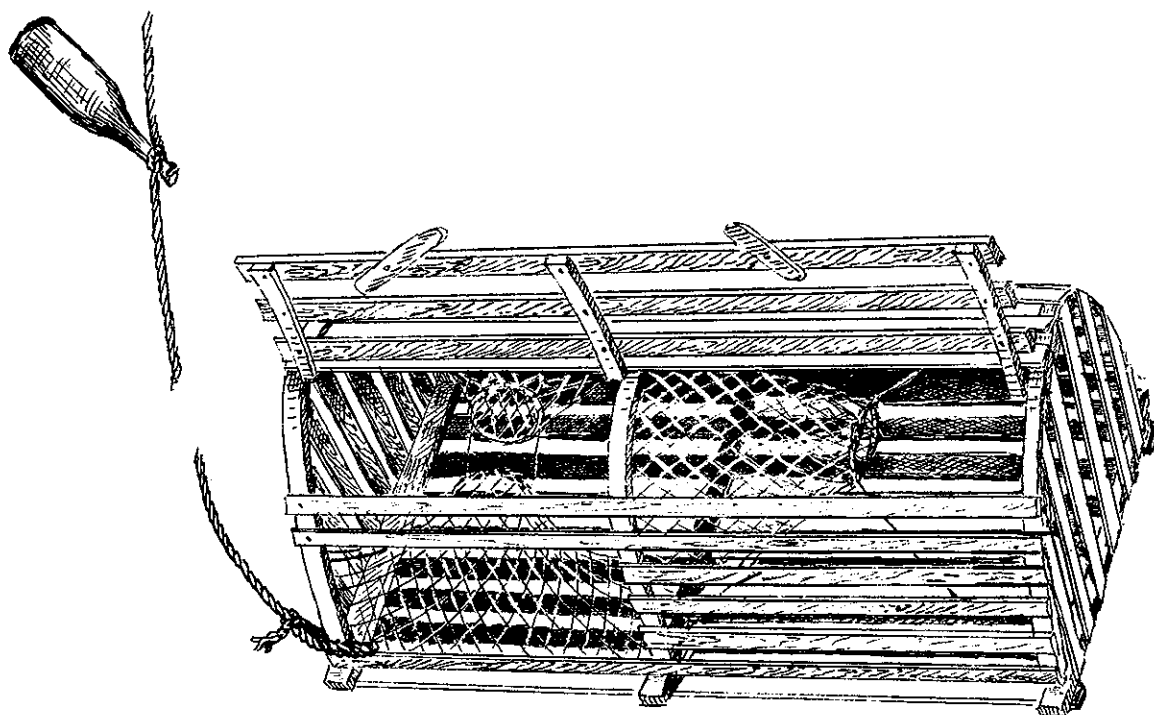


Figure 1

Half-round Lobster Pot

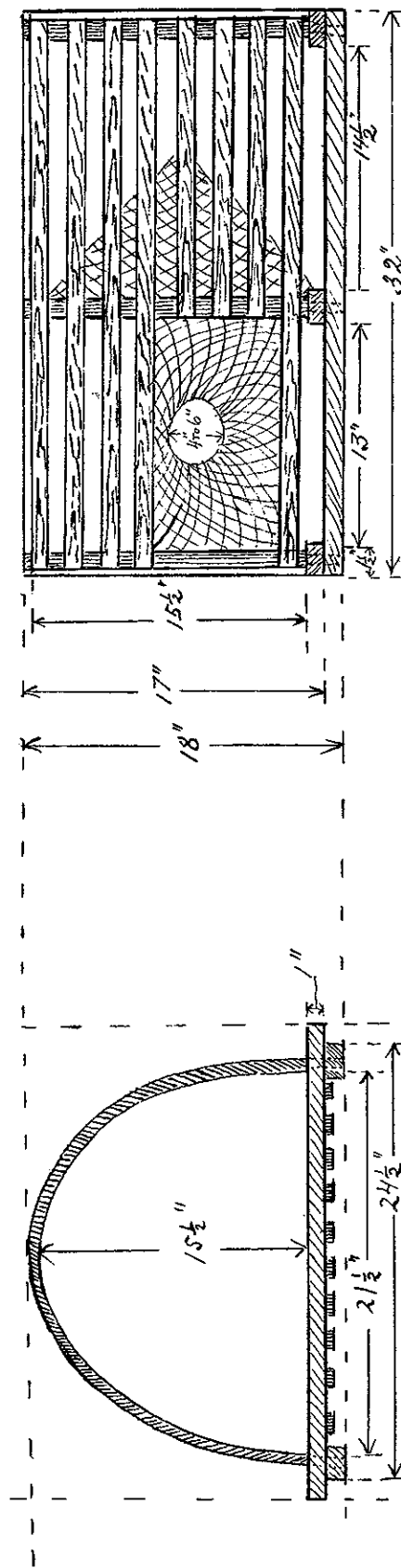
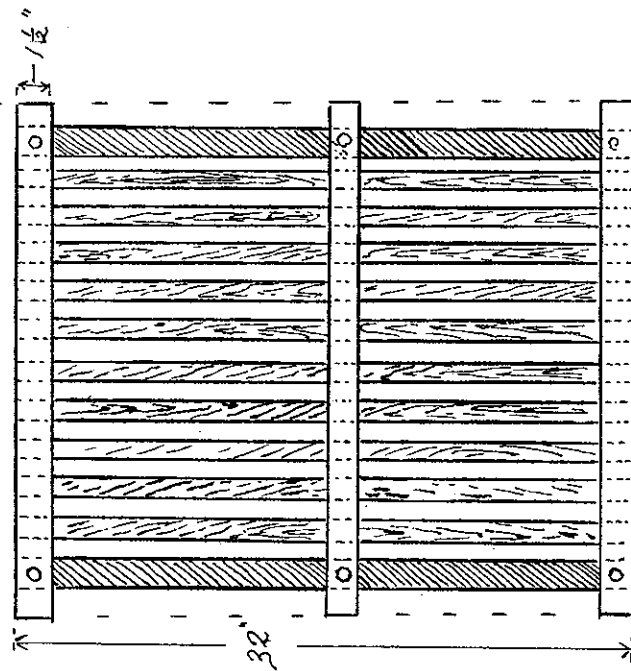


Figure 2
Constructional Lay-out for a
Half-round Lobster Pot



center of the middle bow. The buoyline is attached at a lower corner of the chamber end.

The completed trap is weighted with two to four common building bricks which are distributed evenly on the bottom laths so as to maintain the balance of the trap. Laths are nailed around the bricks to hold them in place, or else they are fastened with wire or cord. When the trap is new, and at the beginning of each season thereafter, extra ballast will be needed until the pot becomes thoroughly water-soaked. Large, flat stones are often used for this purpose; they are lashed either inside or outside the pot and are removed after the trap has been under water a few days.

The dimensions and construction of the half-round pots vary considerably. The pots may be from 28" to 48" long. In some localities, especially in Rhode Island and Long Island, the outer heads are often made of wooden laths wired together to form a funnel. A few pots even have the inside funnel replaced by a vertical, self-closing, lath door that traps the lobsters in the parlor. In other places, particularly in Maine, the bows are fashioned from spruce saplings, smoothed and bent into shape.

Rectangular Lobster Pot

The rectangular or "square" pot is of more recent design than the half-round type and is gaining in popularity. The absence of curved surfaces makes the rectangular traps more rugged and easier to repair. These traps also stack better so that more can be carried in a small boat, or stored in a given space.

Originally, the rectangular pot had only one entrance; this was at the end of the trap and opened into the chamber, or shorter section. An inner funnel then separated the chamber from the parlor. However, seaweeds and other debris often caught on the buoy line and slid down to the lower corner of the chamber end, thus blocking the single entrance at the end of the trap. It is now the usual practice to build an entrance on each of the opposing sides of the chamber. With this construction it has been found that there is little chance that both entrances will be blocked by seaweeds or other obstructions.

The earliest rectangular pots were made of wooden dowel rods, 1/2" in diameter, which were fitted into holes drilled in a framework of boards. The runners were often fitted with steel shoes which took up most of the wear and also served as ballast. Many years of service could be obtained from one of these traps, but because of their greater cost and extra weight, relatively few could be fished by one man. Some of these dowel rod, rectangular traps are still used by a few of the older fishermen.

The present-day, rectangular lobster pots vary in the details of their construction and range from 30" to 42" in length. A typical pot is illustrated in figures 3 and 4. It is 32" long x 15-1/2" high; the width at the base is 26"; the width at the top is 22", all outside measurements.

In structure, the rectangular pot is similar to the half-round except that the three bow and sill sets are replaced by three frames made from straight boards. The sides of each frame are 1" x 1" boards about 15-1/2" long the ends of which have been turned or whittled to form cylindrical pins 1/2" in diameter. The pin at the upper end is 1" long; the lower pin is 2" long. The top and bottom sills for each frame are 22" and 26" long, respectively. These are made from stock 2" wide by 1" thick in which, approximately 1" from each end, holes are drilled to receive the dowels of the sides. Since the sills are unequal in length, the sides of the frame slope, and either the holes or the pins must be cut on an angle. After the dowels of the sides are slipped into the holes in the sills, the frame is complete, and the lower pins project about an inch beyond the lower sill. The protruding pins serve to fasten the frames to the runners.

Two boards 32" long, made from the same stock as the sills, are used for runners. Three holes for receiving the dowels are drilled into each board. Two of the holes are drilled about 1" from each end of the runner; the third hole 15" from one end. These holes should be bored either vertically, or at an angle depending on the construction of the pins.

The three frames are fastened to the runners by having each pair of projecting pins slipped into the corresponding holes in the two runners. Galvanized nails are then driven through the sills and runners into the pins in order to secure the joints. A third runner, without holes, is nailed to the bottom sills between the other two runners. Laths, 1-1/8" wide x 3/8" thick, are nailed about the width of a lath apart to the sills and uprights, except where openings are provided for the door and entrance funnels. These openings are fitted in the same way as for the half-round pot, and the trap is weighted correspondingly.

With proper care, three or four years of service can be expected from either type of trap. The cost of materials exclusive of funnels, buoy line, and buoy, is from two to three dollars.

Funnels

The entrance funnels or head webbings are nearly always knitted by the fishermen or their families. A special heading twine of two-ply, Manila or sisal fiber, 900- or 1200-foot size, is generally used when available. However, medium-laid cotton seine twine, 36 to 54 thread, also is finding wide application for this purpose. Jute twine of similar size also has been used with satisfactory results. The use of nylon twine is also becoming very popular, especially along the New Jersey coast.

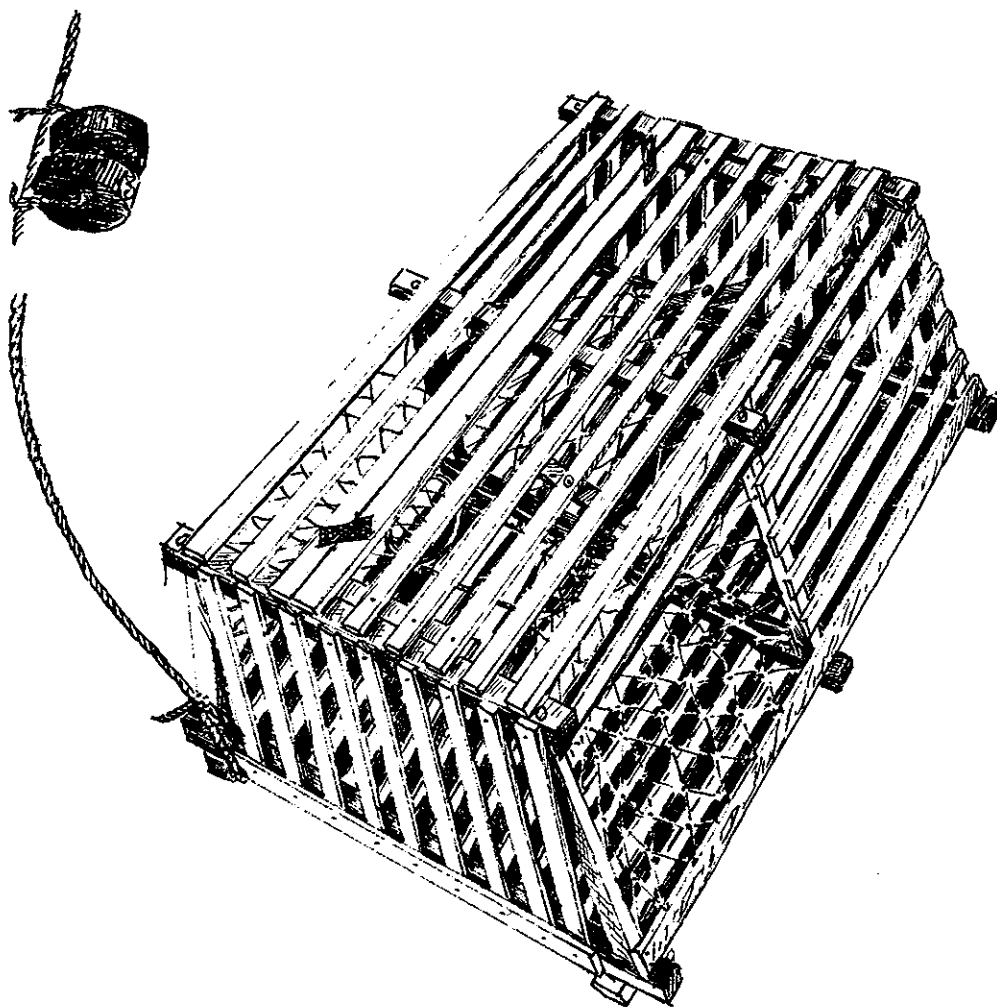


Figure 3
Rectangular Lobster Pot

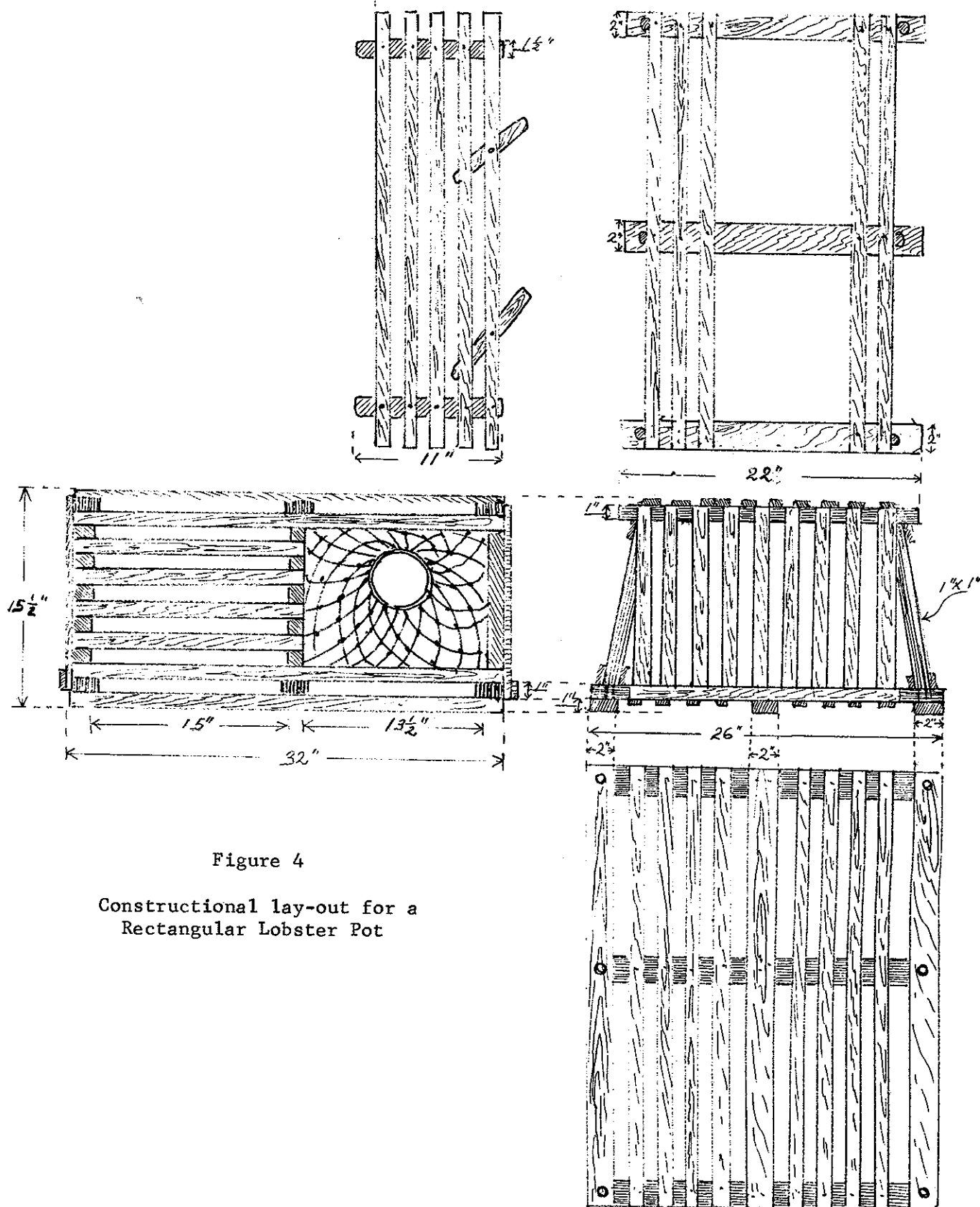


Figure 4
Constructional lay-out for a
Rectangular Lobster Pot

Since the heads are in sea water throughout the lobster season, they need to be protected from fouling and rotting. The fishermen apply net preservatives such as copper oleate, copper naphthenate, coal tar, or water-gas tar to the knitted heads. These treatments materially lengthen the life of the netting.^{2/} Sometimes pre-treated twine can be purchased.

Figures 5A, 6A, and 7A, respectively, show how the 3-1/4" mesh outer head, the 3" mesh outer head, and the 3" mesh inner head (stretched measure) are knitted in the shape of an inverted L. Figures 5B, 6B, and 7B show how the vertical leg is bent to fit the entrance ring. The dotted lines show the attachment of the vertical leg to the horizontal leg.

Figure 5B also illustrates how the ring is fastened to the completed 3-1/4" mesh webbing by "mending." The double lines show the method of knotting the twine to form the half-meshes that hold the ring. However, in Figure 6B the completed 3" mesh webbing is fastened to the ring by lacing. The lace is finished with one knot which corresponds to the point marked "end" in Figure 6A.

Metal or wooden rings, 4" to 6" in diameter, are used in the outer heads; however, as shown in Figure 7B, the ring in the parlor head is made from a 6 or 9-thread rope which is reeved through the meshes and tied to form a circle about 4" in diameter. The finished parlor head is nailed or laced to the middle bow or frame. Two brace lines, tied from the sides of the ring to the bow or frame at the end of the parlor, draw the netting in to form a taut funnel and at the same time stretch the ring to an ellipse about 5" or 6" long. This narrow, horizontal opening, illustrated in Figure 1, is flexible enough to permit easy entrance by the lobster, but makes its escape almost impossible.

Buoys

The buoy line or pot warp is the thread rope connecting the lobster pot on the ocean bottom with the buoy floating at the surface. This rope is also used in hoisting the trap. These buoy lines must be able to resist continuous immersion and severe abrasion; therefore, when hard fibers, such as Manila or sisal are available, they are generally used. The fishermen buy the rope in coils and cut off the desired lengths. The service life of the lines is increased by preservative treatments similar to those applied to head webbings. Cordage dealers often sell pretreated ropes prepared especially for lobstermen. However, many fishermen apply the preservative themselves.

^{2/} Further information is given in Fishery Leaflet 66, "Preservation and Care of Fish Nets," by F. E. Firth and C. B. Carlson. Obtainable from the Fish and Wildlife Service, United States Department of the Interior, Washington 25, D. C.

When the traps are fished singly, the lobstermen use cable-laid 6- or 9- thread ($1/4$ " or $5/16$ " diameter) ropes. These are cut to be not less than a third longer than the depth at which the trap is set so as to allow sufficient stray in ordinary tides or currents. For stronger currents longer buoy lines are needed. A tightly sealed, empty bottle or a cork float is attached to the pot-warp about one fathom from the pot to raise the line off the bottom thus reducing abrasion and keeping the line from catching on submerged objects. This practice also eliminates the possibility of seaweed sliding down the pot-warp and blocking a side entrance.

Traps are also fished trawl-fashion, with as many as thirty, but usually about ten, traps fastened to a trawl by means of 9- or 12-thread rope gangings. These are about two fathoms long and spaced from five to ten fathoms apart. The trawl line is about 18- or 21-thread size and is usually buoyed at both ends, but where the current is strong, one end is buoyed and the other anchored.

Hardly any other piece of fishing equipment is made in so many designs and colors as the marker buoy. Practically every conceivable shape, from an efficient streamlined type to the modest "plug," in accordance with the fisherman's fancy, can be found in use along our eastern shore. Although there has been little attempt at standardization, buoys of streamline shape have been found to float better in a current and to accumulate fewer marine growths. Some of the more common styles are shown in Figure 8.

The many color combinations and patterns serve as means of identification. Some States require each fisherman to have his particular color scheme recorded on his license. Two, and often three colors, are used; the upper part of the buoy usually being bright red, orange, yellow, or white for greater visibility, while the lower part is usually black.

Thoroughly dried wood that has been seasoned as long as possible should be used for buoy construction, and pieces that check or crack should be discarded. Cedar is extensively employed, but good quality white pine serves nearly as well. For long service and maintenance of buoyancy, the cells of the wood should be completely sealed by frequent, thorough painting. A minimum buoyancy of five or six pounds is necessary for supporting the ordinary 6- or 9-thread line. This can be simply tested by immersing the buoy with a five-pound building brick attached. The depth at which the buoy floats determines its suitability.

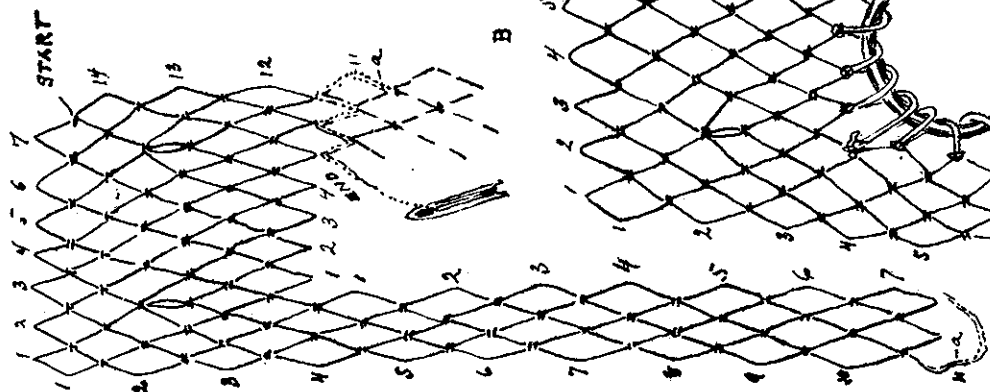
Bait

The bait used in lobster traps generally consists of low-priced fresh or salted fish, unmarketable species, trimmings from nearby canneries, spoiled fish, or fish frames from which the fillets have

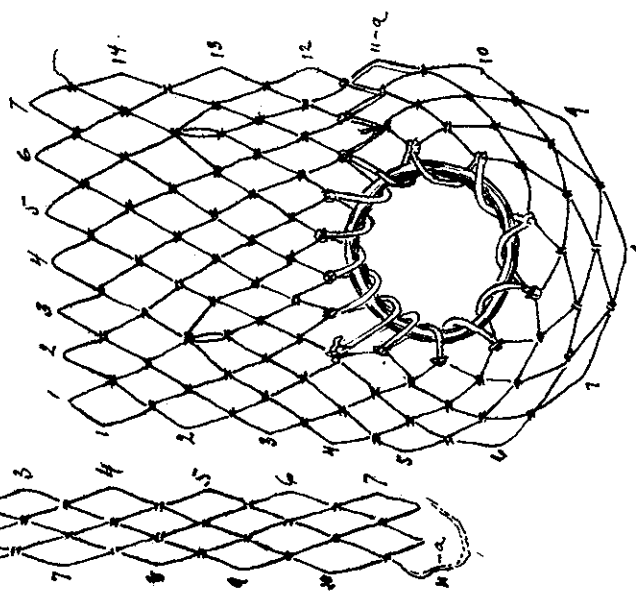
Method of Knitting Webbing used in Lobster Pot Head Construction

Figure 5

A



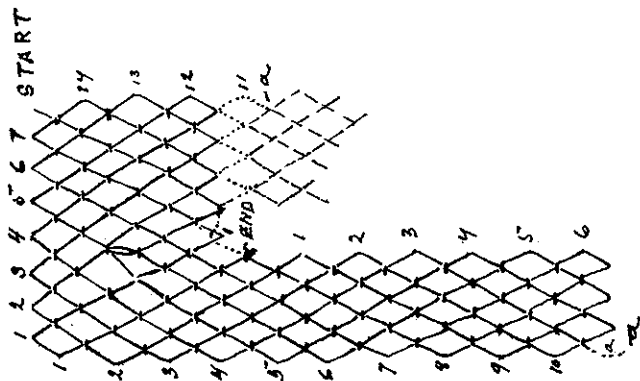
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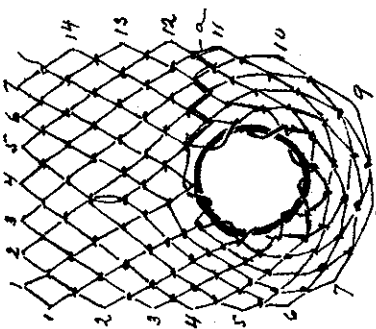
3 1/4" Mesh
Outer (chamber) Head

Figure 6

A



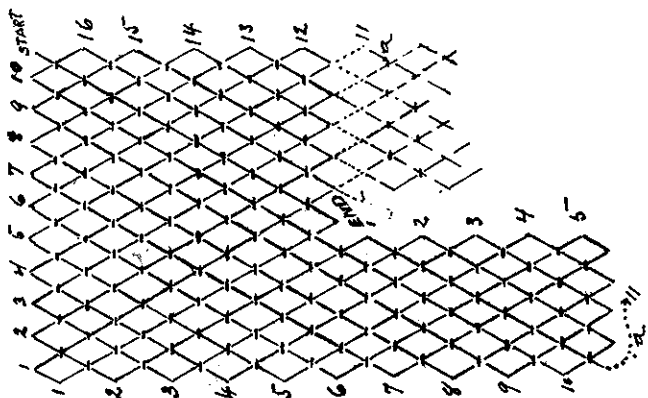
B



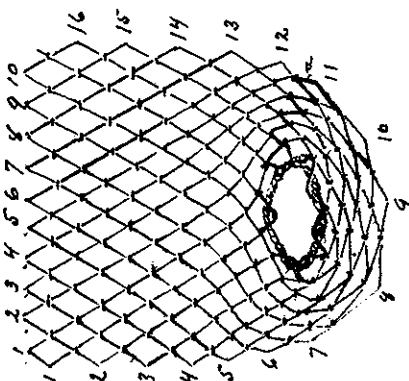
3" Mesh
Outer (chamber) Head

Figure 7

A

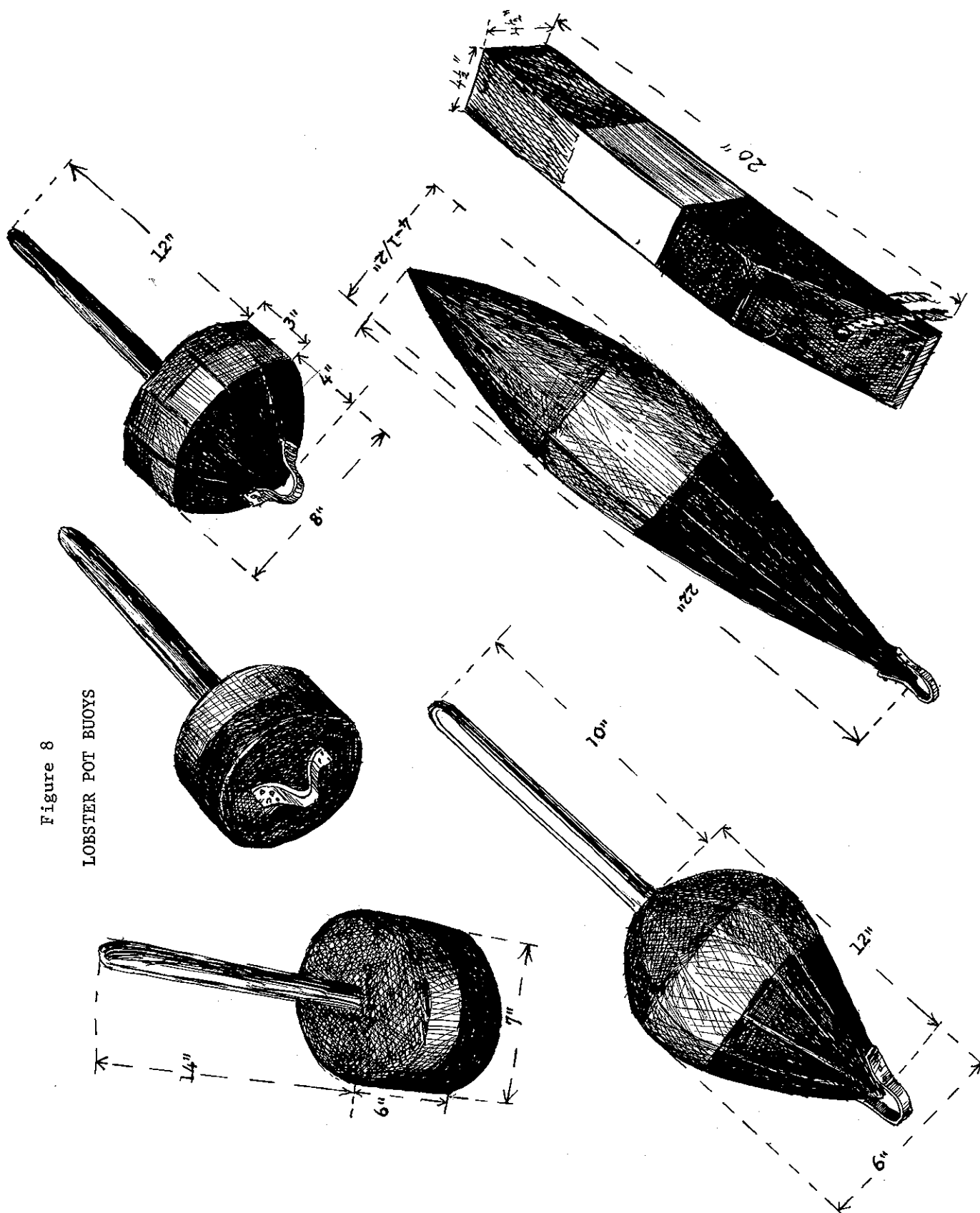


B



3" Mesh
Inner ("parlor") Head

Figure 8
LOBSTER POT BUOYS



been removed. The cost of the bait is an important operating expense since an average of 1-1/2 pounds is required each time a trap is visited.

Oily fish, either fresh, salted, or partially decomposed, seem to possess the greatest attraction for the lobsters. Herring, mackerel, menhaden, and the heads of codfish lead the list as bait, but rosefish frames, alewives, sculpins, and flounders are in demand where they are obtainable. Lobster fishermen in some localities operate fish traps for catching cunners (sea perch) or other small fish to be used for bait.

When cunners or other small fish are used, or when the bait materials are soft or decomposed, they are chopped up and placed in small bait bags. These bags are knitted purses of one-inch mesh, stretched measure, and are treated with coal tar. They are suspended from the top of the middle bow so that they hang in the entrance of the parlor funnel. Larger or more solid pieces, such as cod heads and rosefish frames, are placed on a hook suspended in the same position or on a wood or metal, barbed spear that rises vertically from the base of the middle frame.

Fishing Methods

The United States lobster fishery extends from Maine to Maryland, but the number of lobstermen and their catch is smaller to the south. The pots are set between the shore line and the 30 fathom line, rarely deeper. Range bearings are taken for locating the gear. In most cases the pots are set singly about 10 to 25 fathoms apart; in a strong current, they are set the depth of the water apart to facilitate hauling. Where conditions are favorable, the pots are fished from trawl lines, usually about ten to a line, spaced five to ten fathoms apart. If rectangular pots are so used they are usually made smaller in order to reduce the weight on the trawl.

The pots are visited and hauled daily during the slack tide, weather permitting. The catch is removed, the bait replenished, and the pot returned to the bottom. When the fisherman completes his day's hauling, the lobsters are taken to the shore station and placed in live cars. These are large, lath traps, the tops of which float just level with the ocean's surface and are provided with a trap door through which the lobsters can be removed by means of a dip net. These live cars are large enough to hold a week's catch and are constructed to allow free circulation of water so that the lobsters are kept alive. The lobsters are held in the live car until enough have been accumulated for shipment to market.

Gasoline powered boats, 14 to 25 feet long, are generally used in this fishery. In areas of abundance, where many traps are used, two men often work on one boat; however, most of the lobstermen go out alone. Pots set in shallow water are sometimes tended in dories. If the distance required it, these are towed by a power boat.

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