

## II.—ABSTRACT OF PATENTS ISSUED IN GREAT BRITAIN UP TO THE YEAR 1878, HAVING REFERENCE TO THE PURSUIT, CAPTURE, AND UTILIZATION OF THE PRODUCTS OF THE FISHERIES.

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### DECOYING FISH.

No. 59 of 1632.—GRENT.—Provides the net, spear, or hook with a looking-glass to lure the fish. Provisional. No drawing.

No. 295 of 1692.—WILLIAMS and MARWOOD.—Fish lured by means of lights burning upon or under the water. Provisional. No drawing.

No. 4582 of 1821.—DE CHABANNES.—*Attracting and catching fish.*—Lamp under water having one or more communications with the atmosphere to feed the flame and allow the smoke to escape; mirrors connected with traps or nets to lure the fish; living fish surrounded by glass or other protection in or about the nets, further to lure. Drawing, Plate I.

No. 4815 of 1823.—COFFIN.—*Catching fish.*—Bait tossed overboard to bring schools of mackerel about the vessel; hooks are then used weighted by brightened lead. Drawing, Plate VIII.

No. 2580 of 1862.—FANSHAWE.—For decoying or for seeing when a sufficient number of fish have been collected in a net, employs a stationary or movable submerged electric or other light; phosphorized oil, or other luminous fluid; or submerged reflectors reflecting light from above.

A globe of plain or colored glass, covered by strong wire net, contains the light and is supplied with air by flexible tubing; or a lantern is employed, constructed with a double roof that, the air therein becoming rarified by the heat, a current may be produced and the lantern rendered self-supplying with air.

The illuminating apparatus is lowered through a well near the center of the boat; or lights are sustained by buoys around the vessel.

When lines are used for cod, salmon, and other fishing, places a small wire-protected glass globe filled with a luminous fluid near the bait, on a horizontal line, and supplies air for combustion through a flexible tube. Drawing, Plate II.

No. 1751 of 1863.—JODOCIUS.—Ordinary electric light to lure the fish into a cage or net. Drawing, Plate III.

## FLOATS.

No. 2003 of 1859.—**FEARN.**—A double-cone buoy formed of staves is made air and water tight by means of tongues and grooves. The heads are provided with stays to prevent bulging or collapse, and have a bracket for attaching the rope. Drawing, Plate I.

## FISH TRAPS.

No. 150 of 1860.—**ALLEN.**—*Bait-can.*—For a bait-can which shall occupy less space when out of use, provides a flexible bag open at the top, where the edges are connected to a metal ring serving as a flange to a metal covering-plate. In the center of this plate is an opening provided with a perforated lid, and the plate has a handle capable of being turned down. The metal top is connected by jointed uprights to a shallow metal pan, which forms a bottom for the can. The sides being flexible, the uprights being jointed in the center and the pan at the bottom being larger than the top-plate and ring, the can may be folded when not in use. Small sleeves slip over the joints and keep uprights straight when the can is in use. Provisional. No Drawing.

No. 1120 of 1860.—**STEVENS.**—*Keeping fish alive.*—Supplies oxygen to the water either by injecting air into it or by throwing the water upwards into the air. Uses a box having a false bottom, in which a number of small holes are pierced. Air is supplied by means of a bellows. The water may be raised into the air by endless chains and buckets or by paddle-wheels. No drawing.

No. 3548 of 1867.—**DAMM.**—*Fish-tank.*—Supplies air to the water in the vessel containing the fish. A is the tank, having a pipe leading from the pump C, fitted with a piston-rod, handle, E, and a toothed sector, G, whereby reciprocating motion may be imparted to the pump and the water forced through pipes H and I. The pipe I and head *i* are fitted with short pipes, *a*, open to the atmosphere to force the water to the external air. As the stream enters the tank it impinges against a disc to prevent undue disturbance of the water therein. Drawing, Plate IV.

No. 1425 of 1868.—**LEHEUP.**—*Fish-boxes.*—Employs wooden screws to secure the parts together, or a pin having at one end an eye or hole to receive a pin or bolt; or employs a pin with a T-shaped head, the shank being clinched or riveted; or employs an L-shaped pin or bolt. No drawing.

No. 1276 of 1869.—**ENGHOLM.**—*Retaining caught fish in life.*—The water drawn from the cistern or tank is forced through pipes provided with air-induction nozzles down into the cistern again. An air-pump may be used. Provisional. No drawing.

No. 358 of 1873.—LEACH.—*Apparatus for hauling in nets.*—To facilitate the labor of hauling in great lengths of rope, netting &c., the boats are provided with auxiliary removable screw-propellers, driven by a steam-engine, which may also pump air or water into the fish-well. The water in the well communicates with the water outside of the boat, so that when the latter is in motion a current is established. The lines are coiled around a barrel, which is rotated by the engine. The capstan is mounted on the same shaft with the barrel, and both are connected to the shaft at will by a double-acting clutch. On the lower end of the spindle which carries and actuates the barrel and capstan is mounted a large bevel-wheel, driven by bevel pinion mounted on a horizontal shaft connected with the engine crank-shaft. The bevel pinion is capable of motion endwise on the shaft, so that it may be thrown out of gear with the large bevel-wheel. The other end is provided with a clutch-coupling, so that the propeller shaft may be driven when required. The barrel is provided with a traveling guide to lay the rope evenly when wound thereon. The guide is provided with grooved pulleys mounted on a vertical double-screw shaft, which is driven at a varying speed, regulated by the coiling-barrel, by means of chain and pulley on the lower end of the hauling-barrel. No drawing.

No. 1281 of 1873.—LEACH.—*Fishing.*—Upper part of the boiler projects through the deck and is provided around its upper edge with a circular rail or guide which supports the barrel of the capstan, which latter forms a cap for the boiler, and is provided with anti-friction wheels which run on the circular rail or guide on the top of the boiler. To the lower edge of the capstan barrel is adapted a horizontal guide-wheel, with a V-shaped edge, which runs against V-shaped guide-wheels mounted in bearings secured to the deck. The capstan barrel also carries a large toothed wheel which is driven by a pinion on the upper end of the vertical shaft mounted in bearings attached to the side of the boiler. The large toothed wheel and large horizontal guide-wheel are attached to a band-break-connection to the capstan. No drawing.

No. 4043 of 1876.—LAKE.—*Apparatus for catching fish.*—A sliding shank or bar terminates in a disc, in the center of which is pivoted a latch. Hooks are secured to the lower ring of a crown and pass through openings in the said disc. The crown is composed of a ring, disc, and connecting ribs, this disc having an oblong slot for the passage of the shank. A spiral spring surrounds the shank, and has a tendency to push the first-named disc in the direction of the points of the hooks and cause the latter to close. A bar or dog is fastened to the crown disc, and is provided with a lip which engages with the short end of the latch when the device is "set."

The bait-holder terminates in a hooked end, being pivoted at its opposite extremity to the first-named disc. This holder is bent to form an angle so as to engage with the latch.

To set the trap, compress the spring by bringing the disc and ring towards each other until the lip passes over the lower end of the latch. The other extremity of the latch rests in the angle of the bait-holder. As soon as a fish displaces the holder by taking the bait, the latch is liberated from engagement with the lip of the dog, and the spring causes the disc and ring to move apart, bringing the points of the hooks together firmly securing the fish, which, in most instances, will be instantly killed. A ring is provided to which the line may be fastened. No drawing.

#### FISHWAYS.

No. 974 of 1858.—**PHYMONI.**—*Apparatus for Catching Fish.*—A trench cased with brick, wood, or stone, provided with a cover.

Operation: Raises the cover by means of cross-bars a few inches to allow the water and fish to pass in, when the fish will secrete themselves within the trench. When necessary, places bait in the trench to allure or decoy the fish. Also, places along the sides of the trench, against the apertures, a lattice of wire so hung as to rise or fall and close the aperture against egress of the fish. No drawing.

#### HARPOONS.

No. 1367 of 1783.—**BAYLES.**—“A triangular instrument which, when struck, pushed, or thrown, and falling on its point on large fish, will penetrate, cripple, kill, and hold such fish; or, if falling on its side, its withers will grapple and take the fish.” No drawing.

No. 4563 of 1821.—**CONGREAVE and COLQUHOUN.**—Force the barbed instrument into the fish by means of a rocket. Rocket may be used alone, or before or behind the harpoon, or to carry a line, or a shell which, bursting within the body of the whale, will kill it, and may besides fill it with gas and prevent its sinking. No drawing.

No. 8541 of 1840.—**LANCE.**—The rod is provided with a screw-thread running its entire length and working into a ferule in the head of the harpoon; to the reverse end is attached a fly, which forces the harpoon into the fish as he moves forward. Attached to the harpoon is a buoy, to assist in impeding the fish's progress.

Figure 4 is a varied form of the instrument, made with triangular-cutting edges toward the point, and furnished at its base with barbs which turn on pivots. Drawing, Plate V.

No. 125 of 1856.—**RECHTEN.**—The barb of the harpoon is made in one piece, turns on a center at the end of the shaft, and is retained by a peg, so that when the barb enters the fish the peg will be broken and the barb will place itself at right angles to the shaft. The shaft consists of two bars welded together; the head is made tubular a short distance, and a hole extends transversely through it. The harpoon is shot from a gun. Drawing, Plate II.

No. 1110 of 1857.—TINDALL.—To obtain precision in firing, non-liability to derangement, to hold the fish in whatever position the harpoon is lodged, and to increase the efficiency:

The muzzle of the gun is of smaller diameter than the rest of the barrel, for fitting on a collar contained in the center of the harpoon-head when the harpoon is to be discharged. Collar has on each side a short barbed harpoon-piece, with the barbed ends turned backwards. Line attached to harpoon-pieces by means of a thimble connecting it with a shackle, jointed to the harpoon-pieces. Gun loaded with a long cylindro-conoidal missile, a short piece of the after end of which is made to fit the bore of the gun, whilst the rest is of a reduced diameter, terminating in a cone or point. Mouth of harpoon collar fits exactly to smaller forward portion of the cylindrical ball, and is turned out internally to fit to the angle forming the connection between the larger and smaller diameters of the ball. Ball in barrel close up to powder of charge, and collar with its duplex harpoon being placed upon the muzzle, it follows that when the weapon is discharged the ball enters the collar, but being caught therein at the part behind exactly fitting the bore, it carries away the duplex harpoon and the line with it. Ball and harpoon thus enter the fish together.

With duplex harpoon just described may use an expanding harpoon or harpoon-shot, the two harpoon pieces or arms which it carries being folded down and retained by the barrel of the gun. A spring throws them out when the harpoon is discharged, and pull of the fish expands them fully. Arms of this harpoon are at right angles to those of the main harpoon. The expanding harpoon has studs to guide it and secure the correct relative position of the two sets of harpoon arms.

In another form, shown in figure 6, the head is of the common form, but fitted with a solid cylindrical shank passed through a cross-piece which fits upon the muzzle of the gun at a distance to allow the escape of the compressed air when the gun is fired. To this cross-piece is attached the shackle for connection with the line and rings. The after end of the harpoon shank has a stud or collar piece, and when the gun is fired this stud or collar piece strikes against the arm through which the shank is passed, thus carrying the line along with it. Drawing, Plate VI.

No. 2301 of 1857.—ROYS.—Rocket with an explosive charge in its head is attached to a feathered shaft provided with barbs. The rope or chain is attached near the rocket-head and is also provided with barbs. Drawing, Plate VII.

No. 2340 of 1857.—ROYS.—A small tube has barbs projecting from the sides, and to these a bridle is attached, which is connected to a cord or chain, and upon this a cross-bar is fixed to prevent the shell passing through or entering too far into the fish. No drawing.

No. 450 of 1861.—WALKER.—The harpoon has jointed barbs at its point and a case containing the explosive charge. The opposite end is formed in the shape of a hook and is provided with a spring catch to secure the link and line. Drawing, Plate III.

No. 550 of 1865.—ROY and LILLIENDAHL.—The spear is provided with jointed barbed arms which open outwardly. Drawing, Plate II.

No. 3312 of 1868.—WELCH.—To the head of the shaft are secured a shell, B, and barbs, C, the latter hinged upon a pin and kept closed by an elastic band. The shaft is bored out and the igniting fuse is placed therein. E is a wire ring to which the line is attached. In figure 4 *b* is a metallic tube around the fuse. Drawing, Plate III.

#### HOOKS.

No. 1719 of 1789.—JOHN ANDREWS.—The fish-hooks are first formed of steel wire in the usual way and then hardened, tempered, polished, and completed.

The hooks, cold, are placed upon thin cap paper and covered with yeast to prevent the fire from penetrating too quickly into the steel, injuring the beard and fine point; they are then placed upon an iron plate and put into an iron case and placed in a slow fire until red-hot, after which they are removed and placed in a tub of milk-warm water for the space of one minute, and finally in fine emery, where they are heated until dry. The hooks are then brightened by agitating them in a barrel containing a mixture of water, castile-soap, and emery, after which they are again dried by being brought in contact with dry ash sawdust, and put into leather bags and agitated by hand.

In order to temper the hooks, hour-glass sand made hot and the fish-hooks placed loosely therein are kept constantly agitated, by which means, also, the hooks will become dark blue. The hooks are then removed, placed in a leather bag, and agitated, and afterwards they are put up in steel paper. No drawing.

No. 2063 of 1795.—WILLIAM BELL.—Casts hooks from steel or common fusible iron. No drawing.

No. 11520 of 1847.—MOSES POOLE.—The hook is so constructed that by the aid of instruments combined therewith the holding of the fish will be more certain.

*a*, the hook; *b*, the retaining instrument which is attached to the stem of the hook at *c*, there being a stop at *d* to prevent the hook and retaining instrument from coming too close to each other. *e* is a spring which has a tendency to keep the hook and instrument closer together. The spring *e* is affixed to the stem of the hook and connected to the retaining instrument by means of the short link *f*. In the retaining instrument *a*

notch is made, into which the end of the sliding bolt *h* enters, such sliding bolt being slotted and attached by studs to the stem of the hook *a*. Drawing, Plate IV.

No. 533 of 1852.—A. F. BAINBRIDGE.—*Flies*.—Attaches the wings, fins, &c., to the hook by means of elastic, flexible, and controllable thread; such as vulcanized rubber. Drawing, Plate VI.

No. 889 of 1852.—G. A. HUDDART.—Artificial-fly wings resembling the natural wings of flies, made from rubber, gutta-percha, or analogous compounds, by molding, the molds having lines or markings corresponding to or in imitation of the markings of the wings of the natural insect. No drawing.

No. 2902 of 1853.—R. J. N. KING.—*Artificial bait*.—Artificial bait for fish, in the form of a minnow, made of brass or other metal, formed square inside. Side hooks are fastened to the minnow. A brass block is fitted inside the minnow, to which steel springs are riveted, and hooks which extend from the tail of the minnow are soldered to these springs. No drawing.

No. 923 of 1857.—WILLIAM H. BOX.—First, electroplates fish-hooks; second, attaches the hook directly to the swivel-box by means of a knob or pin-like head, and not to an eye, as usually practiced. Drawing, Plate V.

No. 1135 of 1859.—WM. E. NEWTON.—“Sockdologer” fish-hook, rendered perfect and sure in its operation and less dangerous to be handled while baiting, by arranging between the main hooks, and connected to the same by two arms, *D*, *D'*, a bait-hook, *F*, in such manner that by forcing the two arms to a horizontal position the main hooks are spread open or set. The top portion of the main hooks is made elastic, so that by the action of this portion, together with the power obtained by two additional springs, the main hooks spring together as soon as the slightest strain on the bait-hook disturbs the horizontal position of the two arms. Drawing, Plate V.

No. 428 of 1865.—WM. A. HACKETT.—The fins, wings, or vanes, made of metal, horn, bone, or other material, are secured to the fishing-hook in such manner that when the said hook is drawn through the water or held in a running stream it will be made to spin or twirl. The hook is swiveled to the line. No drawing.

No. 3177 of 1865.—CHARLES BAYLESS.—Makes at the junction of the stems of the two hooks a spring by coiling or bending the wire of which the double hook is made. Around the stems of the double hook a band or ring is placed capable of sliding upon said stems. No drawing.

No. 413 of 1866.—JOSEPH WARNER.—Makes at or near the end of the shank of the hook an eye, *b*, and side-grooves or depressions *c*, into

which the said eye opens and by means of which eye or eye and grooves or depressions the line or gut is readily and securely attached. Drawing, Plate V.

No. 150 of 1867.—GEDGE.—A double fish-hook, composed of two parts or branches.

The first branch, *a*, is bent at right angles at its upper part, where it is pierced with a hole, *e*, the edges of which are rounded for the better passage of the line *l*. At its lower part it has a hook on which the bait is placed.

The second branch, *f*, is attached to the first at *b*, and is held in a fixed position by a piece, *c*, the sides or cheeks of which form springs nipping and retaining this branch, which is further provided with a ring, *G*, and a hook.

To use this fish-hook, open the branch *f* and fix it to the collar or nipping piece *c*, pass the line through the hole *e*, of the first branch, then attach it securely to the ring *G*, of the second branch, and then bait the hook on the first branch *a*. Drawing, Plate VIII.

No. 1765 of 1867.—WELCH.—*Swivel for fishing tackle*.—The box or case of the swivel is made of metal tubing open at both ends. To one end attaches, by soldering, a loop. The shank or stem of the swivel, which works in the box, is made of wire, and is provided with a knot at one end, the knot being situated within the bow or loop of the case when the stem is placed within said case. The opposite end is fashioned into a loop. By this construction the shank or stem is irremovable from the case, and at the same time free to rotate within it, while the case is free to rotate upon the shank.

In applying the swivel to spinning bait, solders the tube constituting the case to the back of this spinning bait; but instead of soldering the loop or bow to the box or case itself, it may be soldered to a tube or portion of a tube soldered to the spinning bait, within which last-mentioned tube or portion of a tube the box or case of a swivel is fixed. The hooks are attached to the loop or end of the shank or stem, and the end of the fishing-line or swivel connected with the fishing-line is attached to the loop or bow of the spinning bait. Drawing Plate, VIII.

No. 2714 of 1867.—A. MORRALL.—A piece of wire is bent into or caused to assume such a shape that when in its normal condition it nearly represents the letter **V**. The ends of the wire are formed into barbed hooks. When baited the hooks are pressed together. Drawing, Plate VIII.

#### NETS.

No. 1872 of 1859.—STUART.—Manufactures nets of single yarn. No drawing.

No. 3099 of 1860.—HENRY.—The net submerged has a rubber tube carried around and attached to it, which communicates with an air-pump



for inflating it with air, causing the net to float. Empty casks are also attached as floats. A weight is fastened to the bottom of the net by hooks, which may be opened at pleasure by a cord operated from the boat to allow the net to be disengaged from the weight and float to the surface of the water. Drawing, Plate IX.

No. 492 of 1861.—**JAMES**.—The nets are buoyed by balloons inflated with air, and having proper ballast (water). The nets are drawn in by a windlass or by other suitable means. Drawing, Plate X.

No. 1871 of 1863.—**HECTOR**.—The net is formed with compartments and closing apertures to retain the fish in the net. Drawing, Plate X.

No. 3334 of 1865.—**HURN**.—Forms the nets of continuous pieces of tanned leather. No drawing.

No. 193 of 1866.—**BRYSON**.—Maintaining artificial light under water for the purpose of attracting or decoying fish.

First. Has a copper vessel with two compartments, into one of which oxygen is forced or condensed, while the other contains hydrogen, also forced or condensed. Each compartment is provided inside with a valve to regulate the escape of the oxygen and hydrogen to the point of combustion, so that these gases are not allowed to mix except at that point, whereby explosion is prevented. Light having been applied to the gases, the apparatus is lowered into the water and the gases continue to burn until entirely consumed, the presence of atmospheric air to keep up combustion not being necessary. The light is covered with a water-tight glass globe, provided with a receptacle to contain the water generated during the combustion. The light, when introduced under the water, attracts the fish thereto. Lime or other substance may be employed in contact with the gases.

Second. Has nets for catching the fish attracted by artificial lights.

Two nets, the upper being larger than the lower; attaches weights to the circumference of the upper net, and floats at and near its center, the lower net being placed under the light. The upper net is let down over it, which, owing to the weights and floats, descends somewhat in the form of an umbrella, and incloses all the fish within its reach, which are thereby caught between the two nets. Drawing, Plate IX.

No. 2008 of 1866.—**MACK**.—To the buoys and net anchors are attached. The rope from the anchors serves as guide lines to the net. Lights are also used to attract or lure the fish.

*a*, anchors; *b*, bottom of sea; *c*, main line to the buoys; *d*, stretching-tackle for bottom of net; *e*, stretching-tackle for upper part of net; *f* and *g*, stream stopper-tackle; *h*, stretching-tackle to the surface of the water; *k*, net; *l*, *m*, *x*, bait; *n*, electric light; *o*, *p*, bags filled with herring; *v*, buoy. Drawing, Plate XI.

No. 1331 of 1867.—HALLETT.—The nets have a platform of triangular or semi-circular shape. To the mouth of the platform attaches weighted chains, also a lightly loaded line through the center of the platform; intersects the platform at intervals with cod-lines or light roping by lacing. To the sides of the platform by lacing a weighted line or chain, attaches a "walling" or "leader" of net work, which runs around all sides of the platform except the mouth. No drawing.

No. 1332 of 1867.—HALLETT.—The net is made cone-shaped and the upper part of the mouth is well supported by buoys. The under part of the mouth is made with a deeply curved margin, bordered by a ground-rope or chain, which is heavily weighted, or the chain is tarred or covered with oakum or hemp, or it is galvanized. The net is fitted with two pockets, one on each side, made by lacing the upper and under parts, beginning at the outer edge and gradually working toward the middle and small end of the net; attaches to the sides of the mouth leaders of net-work with sole and back ropes, the sole-ropes being loaded and the back-ropes being corked. To the bottom of the net attaches chains loaded. At the rear end of the net attaches a heavy weight; at the front end a buoy. No drawing.

No. 1333 of 1867.—HALLETT.—The same as No. 1331 of 1867, and having pockets similar to those used in beam trawls, except that they are not covered with net-work at the surface of the water, and have in place thereof two small buoy ropes. No drawing.

No. 2140 of 1867.—JOHNSON.—Twists the twine while in the process of netting and makes the net with a looped knot. Forms the net of twines, alternate ones being larger than the others. Drawing, Plate VIII.

No. 792 of 1877.—CORRIN.—Fittings for sinking fishing nets. Weights of oval form have a hole through the center through which is run a line about two feet in length; to this line at each end of the weight another line is spliced, and both are fastened to the bottom of the net, so that the line through the central hole is on a level with the bottom line or rope of the net, and only half or a portion of the weight then projects below the net. No drawing.

#### OYSTER CULTURE.

No. 2930 of 1863.—AYCKBOURN.—Tiles, &c., preferably concave, arranged in groups upon each other and at right angles, catch the spawn as it floats. The tiles are coated with common clay of the consistency of thick cream, and on this is laid Portland cement, to which the young oysters attach and grow. When it is desired to remove them, the oysters and clay are broken off together. No drawing.

No. 1040 of 1864.—CROFT.—Tanks are so constructed that water will pass freely among the oysters placed in rows, inclined with their mouths

upwards, and supported by long narrow tiles indented, to be easily broken, and provided with projections for holding them up. Over the tiles is placed material to induce the spat or brood of the oyster to adhere. Provides water-tanks, the temperature and water-supply of which may be regulated and varied (fresh or salt), but the water should be acclimatized gradually. Has star collectors, formed of wheels on spindles, connected by rollers armed with bunches of bristly substances or hooks. Has also spat collectors, tile perforated and filled with cork. Drawing, Plate XII.

No. 1316 of 1870.—BERT.—The walls of the inclosure are built of masonry, their foundation below the lowest tides and their heights above that of the highest tides, to prevent loss of eggs. The inner surface is irregular at a height of three feet. The bottom of the basin has a declivity toward the center when the trench is formed, in order to drain the water from the basin and suppress the deposits of mud. A torus two inches high is built, perforated at different places to allow the diluted mud-deposits to pass, but prevent the oysters from following.

A, walls; B, rough inner surfaces; C, inner walls; E, trenches; G, toruses; F, oysters; I, platforms; J, stone supports for platforms; L, pillars which support cross-pieces and there movable ceiling. Pl. XVI.

No. 4103 of 1874.—MICHEL.—*Hives for Breeding Oysters.*—First. Moulds from cement rectangular vessels open at top and having their bottoms provided with numerous holes.

Second. Forms an open rectangular trough without perforations through its bottom. The ends of this trough project downward, forming a stand.

A pair of these vessels, the lower one perforated, and the upper one placed on it as a cover, form a hive; numbers of which are placed side by side on the beach or on timber sleepers, to form a breeding and rearing bed.

The lower perforated vessels receive the spat, and are kept clean by the wash-water running through them. The upper vessels, besides serving as covers, form nurseries, and protect the oysters against enemies and changes of weather. Drawing, Plate XII.

No. 3506 of 1875.—DE LAGILLARAIE.—*Breeding or Cultivating Oysters.*—Secures the oysters to a wire and suspends them in the water in a manner that renders them easily accessible for inspection or removal. The oysters thus wired are secured to trellises. The oysters may be placed in cages provided with hooks, said cages being made buoyant and moored to a submerged chain, held by floats. Drawing, Pl. XVI.

No. 2470 of 1876.—JENNINGS and ANDERSON.—*Propagation of Oysters.*—Place the oysters and spat in water-tight receptacles made of earthenware or other material and covered over at top. The site upon

which the receptacles are placed may be enclosed by protecting walls, which, whilst affording protection, will allow of the passage of water as the tide rises or falls; or the receptacles may be placed in water-tight wooden troughs. Drawing, Plate XII.

No. 1447 of 1877.—MEWBURN.—*Apparatus used in Breeding Oysters.*—A box made of any suitable material communicates with the exterior by water and air supply cocks, or has the upper part open without an air-cock, when the apparatus is situated away from the sea and fed artificially, or is closed hermetically when the apparatus is placed so that it emerges at each tide. In this apparatus the collecting hives and the breeding oysters are placed at spawning time, or spawn or spat obtained elsewhere may be put therein. A piece of silk, the meshes of which are too fine to allow the spawn to pass through, is then placed over each water inlet and outlet, so that no spawn or spat can escape when the water is renewed.

Whether the apparatus emerge or not, the collectors should offer the greatest possible surface for the deposit of the spat, and be fed by water, sufficiently clarified by filtering, to insure and maintain the cleanness of the collectors. The water must be renewed without sensible agitation, its introduction be regulated by means of cocks, and a slow current obtained, continuous or intermittent, according to the position of the apparatus. The water is renewed sufficiently often to put the spat in the best conditions of vitality, filtered water being always employed.

The apparatus consists of a box provided at its lower part with a cock which communicates with a filter situated a little below. The cover of the box, which closes it hermetically with the aid of strong bolts or screws, is provided with two India-rubber tubes having valves, one of which opens outward to allow the escape of air at the rise of the tide, while the other opens inward to allow air to enter at the fall of the tide or when the apparatus empties. The box is firmly secured in the water by stakes, to which it is only pinned, to allow of its being removed when required, and the India-rubber tubes are placed on rigid pipes long enough to give the apparatus time to fill before the water reaches their top or the waves pass over.

Inside the apparatus is placed a hive composed of a series of frames containing wire or other gauze, and placed one above the other. The frames are filled with a layer of shells, broken and sifted, and a certain number of parent oysters placed at intervals. There is fixed at the side of and below the box a filter of any suitable kind, through which the water will pass before its introduction into the box. The water arriving at the rising tide will pass into the filter and be deprived of all foreign matter, and finally enter the apparatus above, driving out the air through one of the valves, and carry sustenance to the breeding oysters placed among the frames. The water in retiring allows the second valve to open and admit air to the apparatus.

The spawn or spat, in rising in the apparatus will traverse layers of collectors, and the water in retiring will filter through the layers of broken shells and deposit thereon the spat which it holds in suspension. The apparatus can be inspected daily and the hive withdrawn when sufficiently filled and replaced by a fresh hive. A series of apparatus may be supplied through one filter. No drawing.

## OYSTER DREDGES.

No. 2906 of 1860.—ENNIS.—An open-mouth cage so formed and fitted that when lowered into the water and drawn over the beds it will first disturb and then gather up the oysters.

Fitted to and extending across the mouth of the case, are two scrapers, set parallel to each other and on opposite sides of the cage. In front is a rake held in position by binding-screws forming a double rake. The drag-iron having an eye is secured to the sides of the cage, and to the eye the rope is attached for hauling the dredge. Drawing, Plate XIV.

No. 323 of 1869.—BRABASON.—The links of the dredge are runners like those of a snow-sleigh, turned up at the ends and connected by an iron ring or link which rests on them and presents a smooth under surface which carries it along the bottom of the sea, passing over the spat or brood of oysters without injury to them. Provisional specification. No drawing.

## OYSTER RAKES AND TONGS.

No. 2171 of 1866.—JOHNSON.—Two converging rakes are provided with handles united by a rivet, one handle being provided with a spring which pulls upon the upper end of the other. The rakes are held open by a lever having its fulcrum on the projecting end of one of the handles, one end of the lever taking into a catch upon the other handle and a lowering rope or chain being attached to the opposite end of the lever. The weight of the apparatus will cause the catch to hold as the apparatus is lowered while open. When the apparatus rests upon the bottom, the weight being relieved, the lever unlatches and the rakes are drawn together by the spring. Pulling upon the rope then also draws the rakes together. The teeth are removable. Guards at both the ends and back of the rakes prevent anything falling out. Drawing, Plate XIII.

No. 1438 of 1867.—JOHNSON.—Two rakes with scoop-shaped or open heads, each attached to a handle and the handles connected by a joint, near the middle, the rake teeth coming toward each other. Drawing, Plate XIV.

## ELECTRICITY, PARALYZING FISH, &amp;C.

No. 2644 of 1863.—BAGGS.—Wires or hooks and lines, nets, &c., connected to a galvanic battery. The fish receiving an immediate shock is paralyzed or killed. Drawing, Plate XV.

No. 3228 of 1868.—BENNETT and WARD.—*Electricity, galvanism or magnetic electricity.*—Places in the boat a galvanic battery with its coils and necessary accompaniments, insulated wires, in connection with and passing from the *opposite* poles of the battery and inside or along the line, to which the harpoon or other instrument is attached. No drawing.

## PISCICULTURE.

No. 2966 of 1853.—BOCCIUS.—A vessel having apertures in its top and bottom of such a size as to prevent the eggs or spawn passing through, yet sufficiently large to allow water to percolate into the apparatus when immersed. It is made of two or more sections or parts, one part fitting into or on the other. In the interior are placed trays, one over the other, if required, upon which the eggs are placed. Drawing, Plate XVI.

## REELS.

No. 3157 of 1808.—JOHN CURR.—*Method of applying ropes for catching and detaining whales.*—The boat is provided with a reel, brake, brake-lever, guide for the line, and rollers to keep the line near the center of the boat. When the whale has nearly run out the line of one boat, it may be joined to the line of another boat. Drawing, Plate XV.

No. 1956 of 1856.—KENTON.—Makes the reels of papier maché and passes a metal axis through the reel and connects the winch by which the said reel is turned to the axis. The case in which the reel works is made of a tubular piece of papier maché closed by discs, through the center of which the axis of the reel passes. Drawing, Plate XV.

No. 1806 of 1868.—MURE.—The carrier, to facilitate the winding of several lines and hooks simultaneously on the winder and to permit one line or hook to be withdrawn at a time without entangling the rest or breaking them, consists of a tablet having at each end a cap or ferrule, the center of which is hollow to receive a piece of cork in which to insert the barbs of the hooks. On each side are a number of openings reached by a sloping duct, through which the lines are successively and alternately passed in a hank till completely wound up, the hooks being fixed in a similar manner, openings being made for their reception on both sides of the apparatus. The hooks are protected by a metal band attached to the cap of the ferrule, one end working on a hinge and the other fixing with a clasp. May have a simple line-winder, which is of the same construction, less the cap for bearing the hooks. This apparatus is furnished with a cover, having an opening at one end through which to draw the lines. Another form consists of an endless band of pasteboard in the shape of a flat cylinder, and the lines are drawn around this, being passed through openings at the sides as before. Hook-carriers consist of a wooden plate with ends terminating in a metal cap having notches for the hooks, which are protected by hinged metal bands, the opposite ends

being furnished with hasps. Another form is a bobbin or reel with a cover or case at the bottom, and in the interior is a circular shaft, the upper end of which terminates in a button or cork for the hooks, and the line is passed around small projecting knobs on each side of the shaft at the top and bottom. No drawing.

No. 388 of 1873.—HEATON.—Recesses one of the side disks and places on its axis a pinion facing outward towards the recess and connects the pinion to a hollow axis working through the corresponding plate for winding the line on, and over the recess. On the outside of the disk applies a plate with a rim around its interior, having teeth cut on the inner edge, which gear with an intermediate wheel acting on the pinion. This outer plate works on an independent axis passing through the axis on which the line is wound and is secured in position by the spreading head of a screw on the other side. A handle is applied to give motion to the plate, and from the teeth on the plate acting on the intermediate wheel, motion is given to the pinion and winding axis, the multiple of motion being governed by the size of the pinion and intermediate wheel. No drawing.

No. 3283 of 1876.—CORBET.—*Attaching reels to rods.*—Instead of attaching the reel to the outer surface of the rod in the ordinary manner, provides a frame consisting of two side plates and two tubular or hollow ends. Into one of these tubular ends inserts the top part of the rod, and into the other the lower portion or handle of the rod. No drawing.

#### RODS.

No. 2017 of 1853.—DAWSON and RESTELL.—The joints are constructed in the shape of a segment of a circle; that is to say, the cross-section of the joint will represent the segment of a circle, or that of a tube bent into the shape of a trough or gutter. The joints are permanently connected, and each joint lies in the joint next preceding it when the rod is inserted in the butt, which is made cylindrical and to resemble a walking-stick. No drawing.

No. 461 of 1857.—JOHN BENNETT.—Upon the ends of the rods to be joined rigidly together, attaches a metallic tube or ferrule, the tube on one end being larger than that on the other, so that one of the tubes may enter and slide in the other tube. The larger tube has in its axis a smaller one, so that the tube which enters the larger tube or ferrule slides between two concentric tubes. The two rods are joined together by means of a cylinder of India rubber (which acts as a joint), and the smaller tube or ferrule is provided with a bayonet joint, in which a pin in the larger tube engages. No drawing.

No. 1553 of 1858.—A. PORECKY.—Strips of whalebone, horn, tortoise-shell, or other corneous matter, or the artificial imitations, are formed by

any suitable process into plain, fluted, ornamental, flexible, or rigid tubes. They may be either wholly or partially filled with a suitable composition or material, or may be left unfilled, thereby allowing of their sliding, one over the other, like a telescope. No drawing.

No. 3528 of 1868.—BRITTEN.—Instead of wood, for those parts which are required to be pliant, makes use of steel or other suitable metal that will secure the requisite strength with lightness and elasticity. These parts are formed into tubes, which are tempered in the usual way. The ring-fittings for guiding the line are on little bands of spring metal, which go round the rod and clip it, and are movable along the rod. The whole rod complete can be inclosed in the lower joint by a cap and ferrule. The several lengths of rod are connected by short pieces of thin tubular metal soldered to the ends inside the larger and outside the smaller following lengths, and are made slightly conical in opposite directions to fit tightly when drawn out. No drawing.

No. 1648 of 1874.—MOULTRAY.—In the socket, covered with brass, there is made an incision sufficiently large to receive a spring. By means of two metal pins driven into the wood and covered by brass, the metal spring is fastened. The upper end of the spring is bent upward and placed in the incision at its upper end, so that by coming in contact with the brass covering of the socket it may be prevented from coming out of the incision. In the ferrule which receives the socket and at a place thereon corresponding to the place which the spring will occupy in it when the socket is inserted in the ferrule, an opening is cut to allow the spring to work freely. When the socket is placed in the ferrule the spring holds them fast. No drawing.

No. 1840 of 1874.—JACK.—Fixes the stem part of each joint to its corresponding socket-piece by forming a very small, short projection, or pin, on the large part of the stem-piece, which, when inserted into its socket-piece, enters a small recess cut in from its outer end and is then to be turned round into a groove cut or embossed into the inner circumference of the socket. No drawing.

No. 1806 of 1876.—HOLROYD.—Forms the joint-fitting in the usual way, with the addition to the lower end ferrule of a projecting collar and screwed spigot, both situated at the upper part of such lower end ferrule. Also forms the upper ferrule with an enlarged screwed socket to receive and hold the lower ferrule and its screwed spigot, forming an air and water tight joint when the two are fixed together. Drawing, Plate X.

No. 1553 of 1877.—ASTON.—Takes wood or cane sections, having at each end the usual metallic ferrule, but having a slot, into which is placed a plate of metal pierced at each end, there being a corresponding piercing in the ferrules. Into this secures a pin, thereby forming a joint



4582 of 1821.

DECOYING.

P. 17.

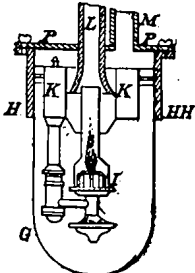


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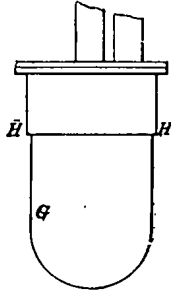


Fig. 1.

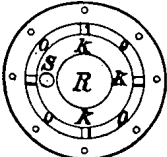


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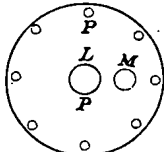


Fig. 4.

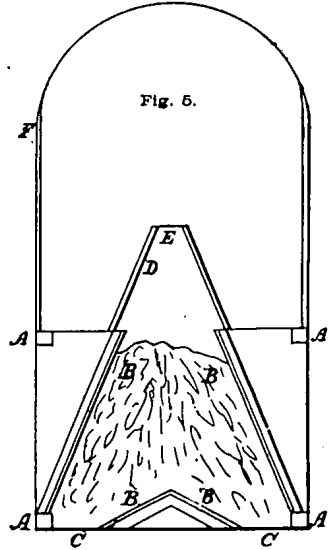


Fig. 6.

Fig. 6

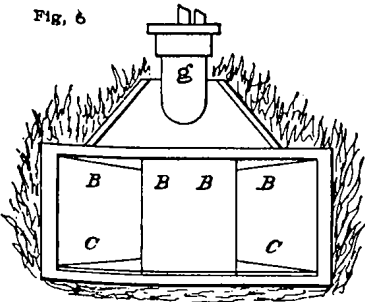


Fig. 7.

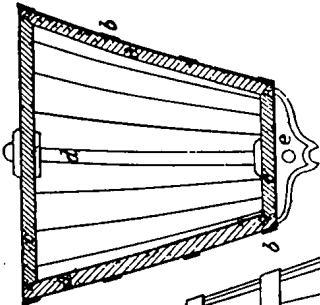
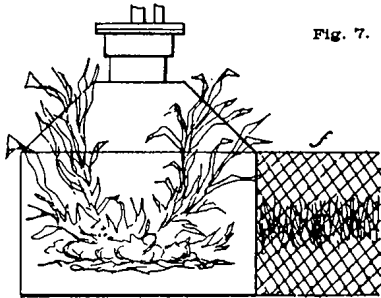


Fig. 2.

FLOAT.

2003 of 1859.

P. 18.

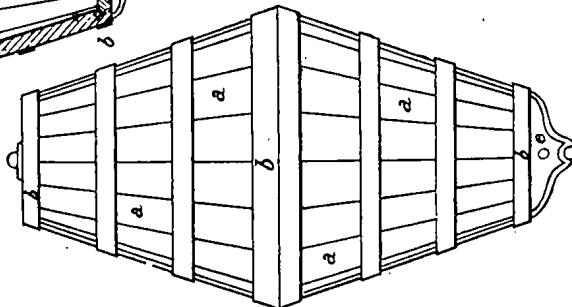


Fig. 4.

125 of 1856.

P. 20.

HARPOON.

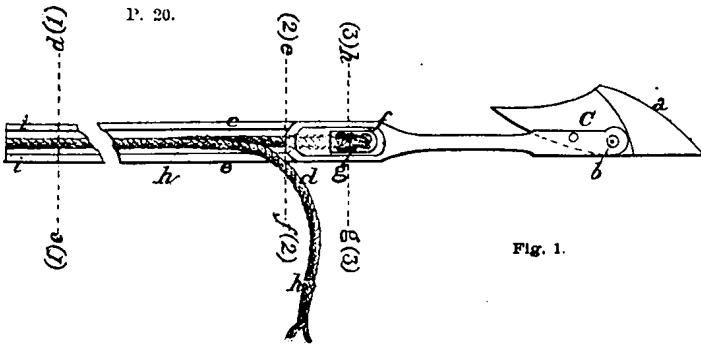


Fig. 1.

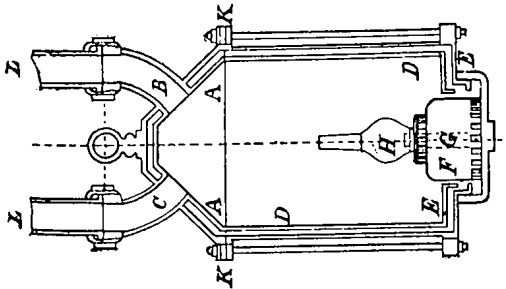


Fig. 3

HARPOONS.

P. 22.

550 of 1860.

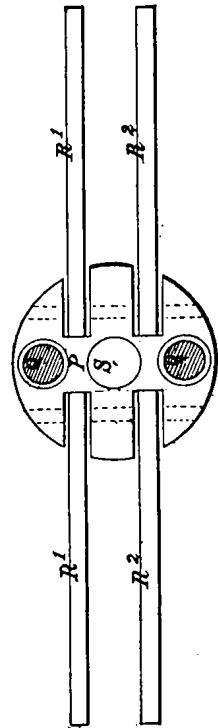
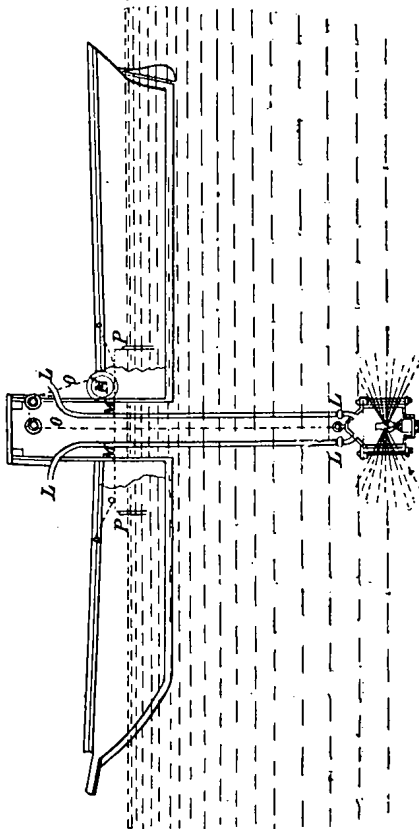


Fig. 1.

DECOYING.

2580 of 1862.

P. 17



1751 of 1863,  
P. 17.

DECOYING.

Fig. 2.

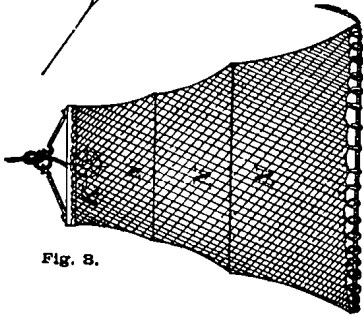
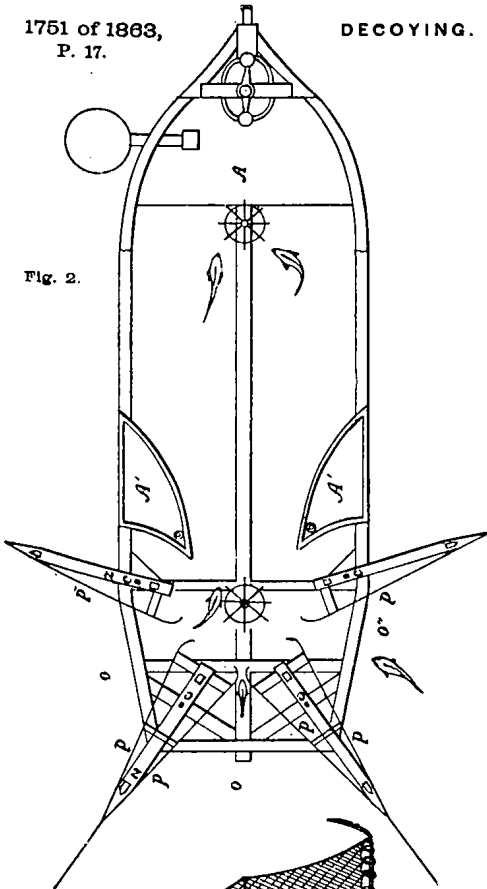


Fig. 8.

450 of 1861.

P. 22.

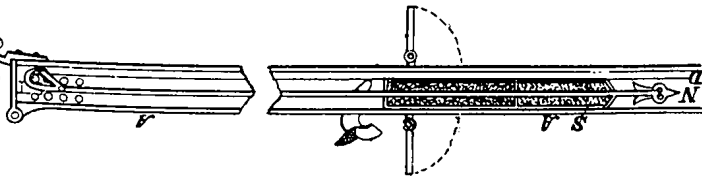


Fig. 1.

3312 of 1868.  
P. 22.

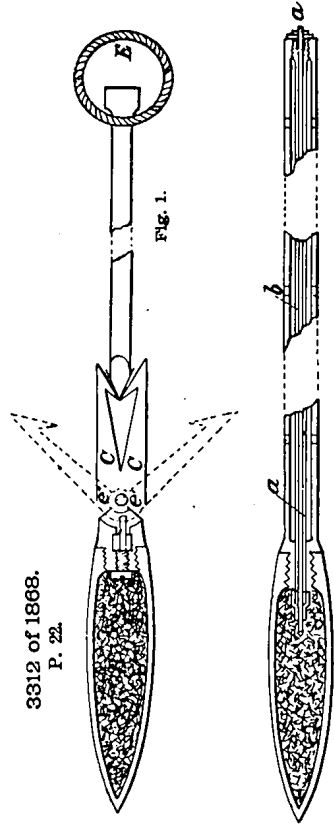


Fig. 1.

Fig. 2.

3548 of 1867.  
P. 18.

FISH TRAPS.

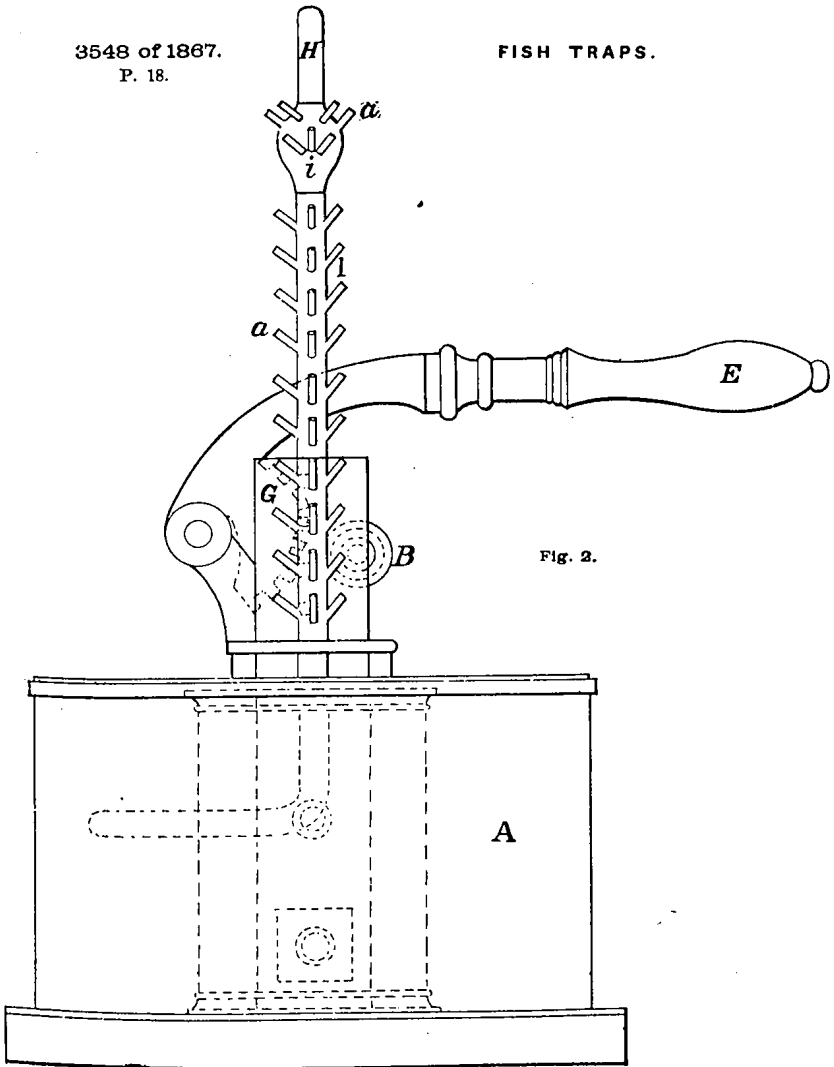


Fig. 2.

11520 of 1847.  
P. 22.

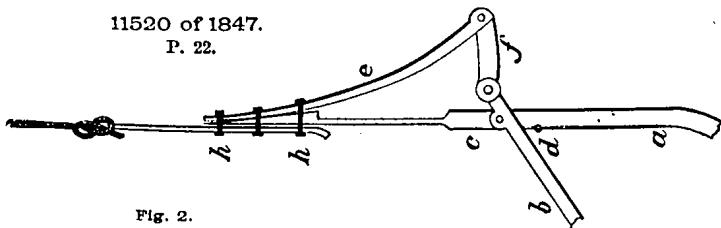


Fig. 2.

8541 of 1840.  
P. 20.

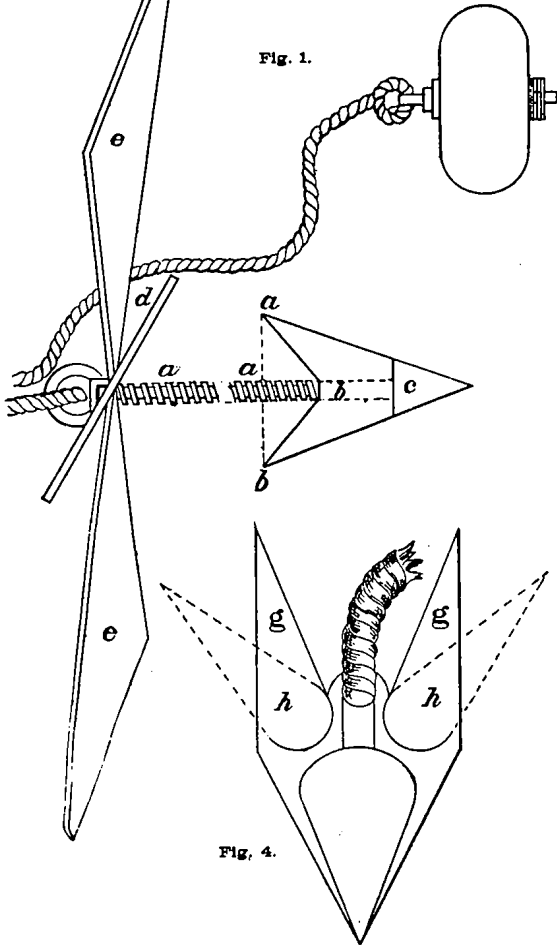


Fig. 5.

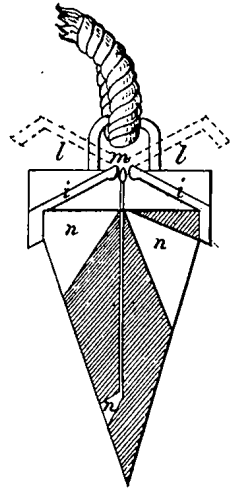
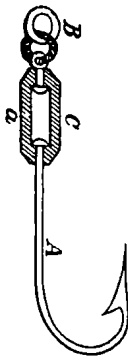
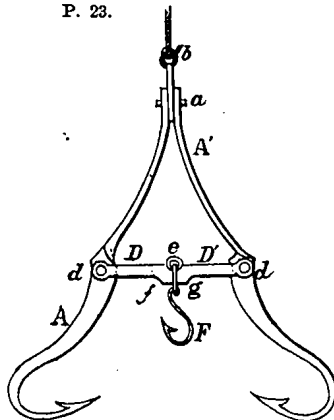


Fig. 4.

923 of 1857.  
P. 23.



1135 of 1859.  
P. 23.



413 of 1866.  
P. 23.

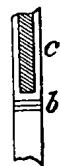


Fig. 2.

333 of 1852.

P. 23.



Fig. 1.



Fig. 2.



Fig. 4.

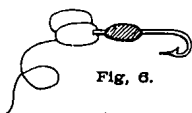


Fig. 6.

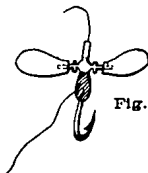


Fig. 7.



Fig. 3.



Fig. 5.

1110 of 1857.

P. 21.

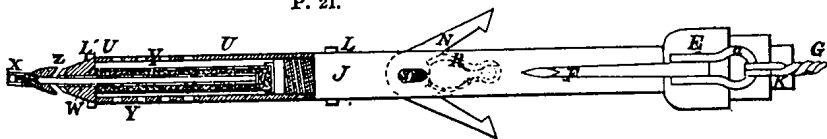


Fig. 4.

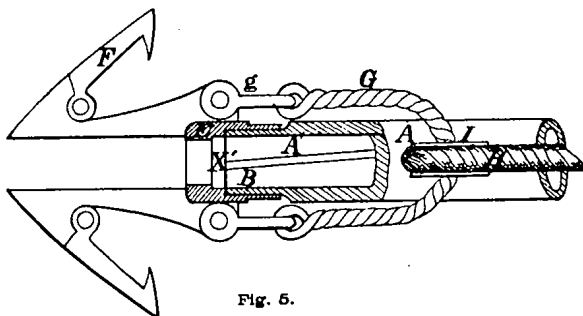


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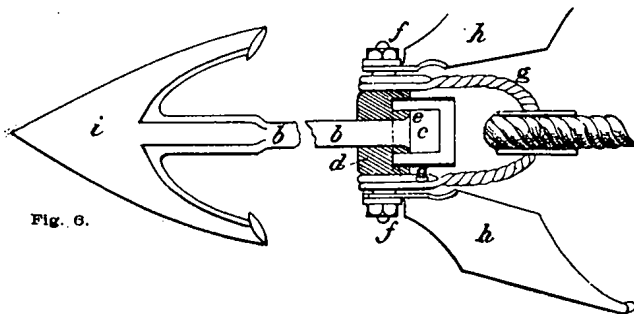


Fig. 6.

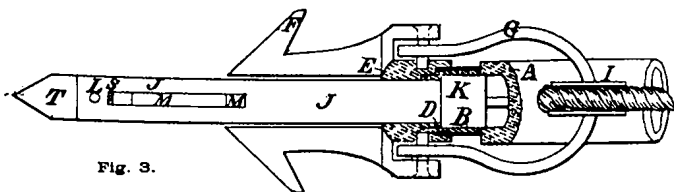


Fig. 3.

2301 of 1857.

P. 21.

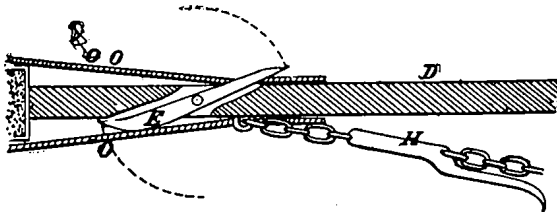
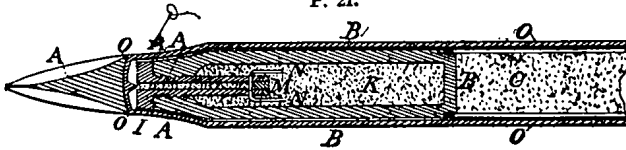


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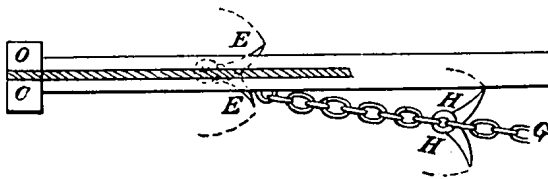
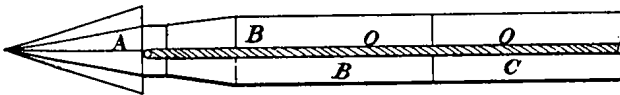
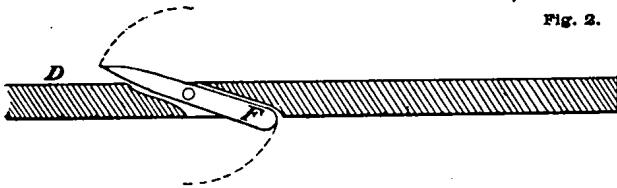
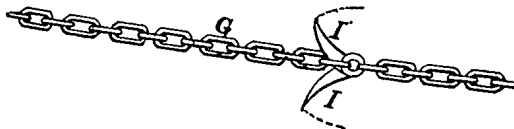


Fig. 3.



4815 of 1823.  
P. 17.

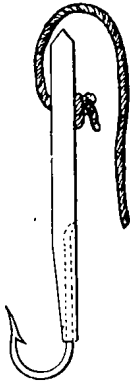


Fig. 3.

2140 of 1867.  
P. 26.

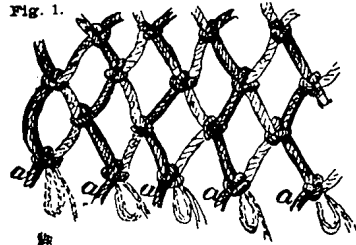


Fig. 4.

1765 of 1867.  
P. 24.

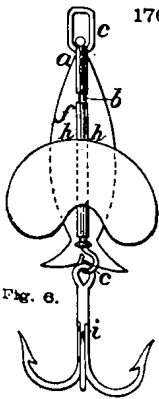


Fig. 6.

2714 of 1867.  
P. 24.

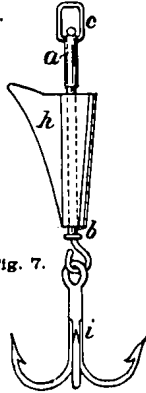


Fig. 7.

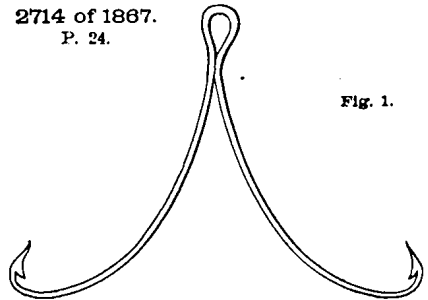


Fig. 1.

150 of 1867.  
P. 24.

Fig. 1.

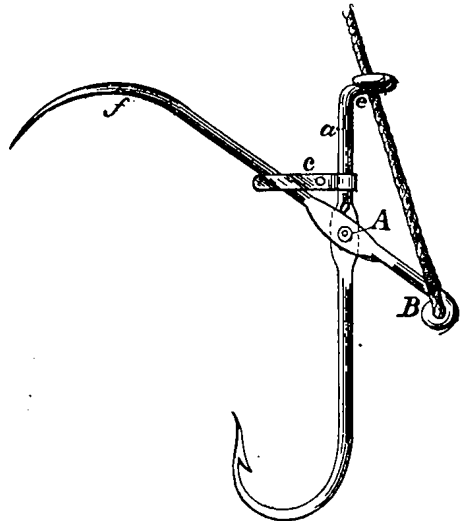
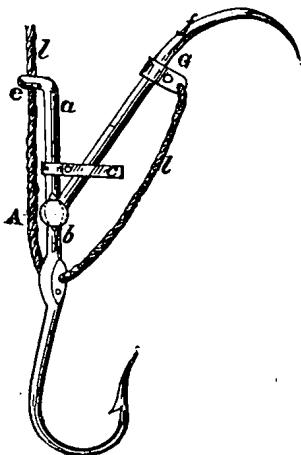
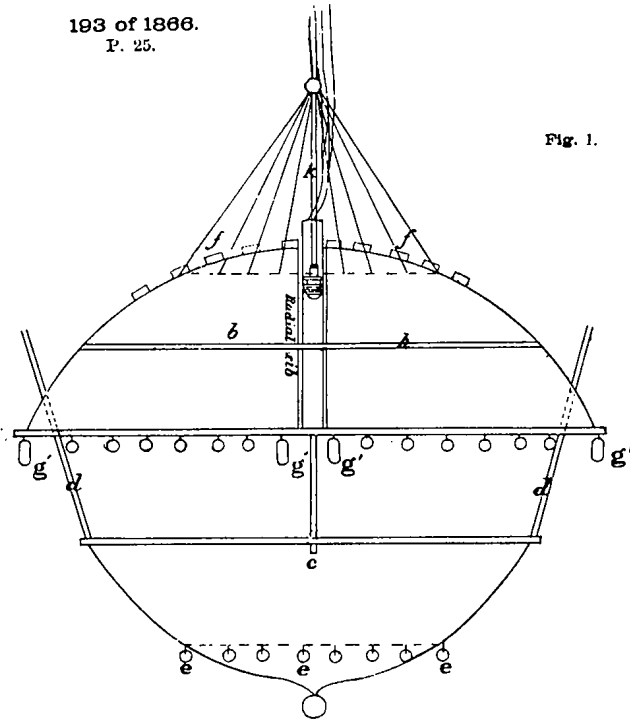


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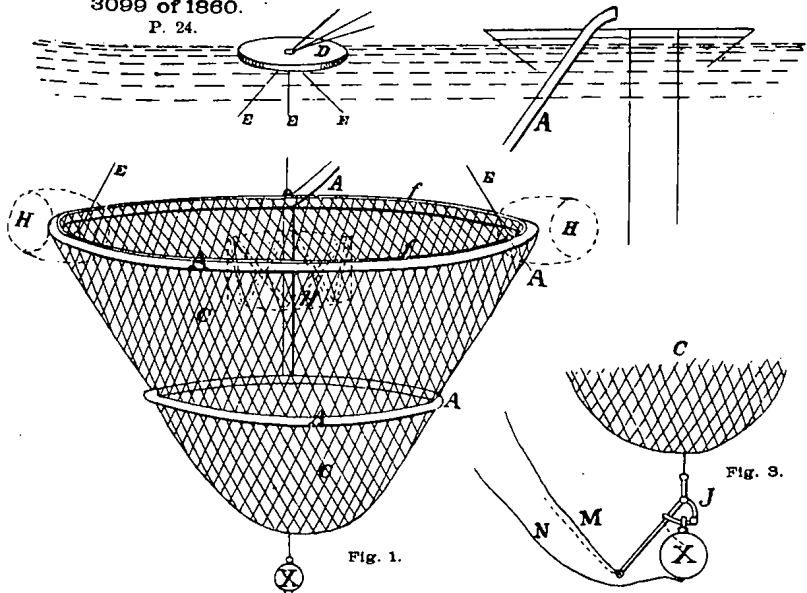


193 of 1866.  
P. 25.

Fig. 1.

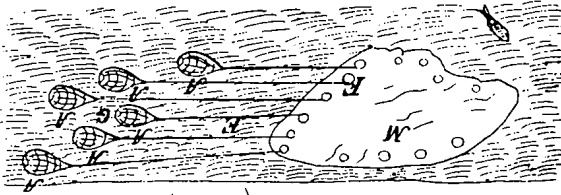


3099 of 1860.  
P. 24.



1806 of 1876.

P. 32.



492 of 1861.  
P. 25.

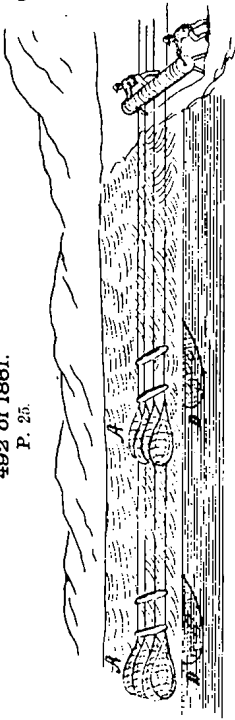


Fig. 2.

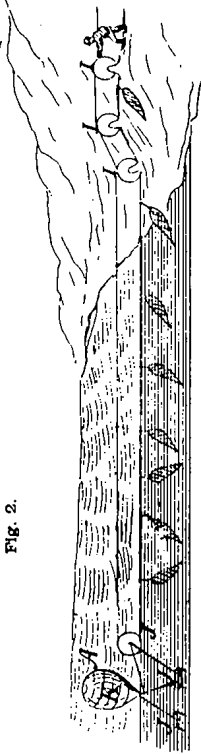


Fig. 3.

1871 of 1863.  
P. 25.

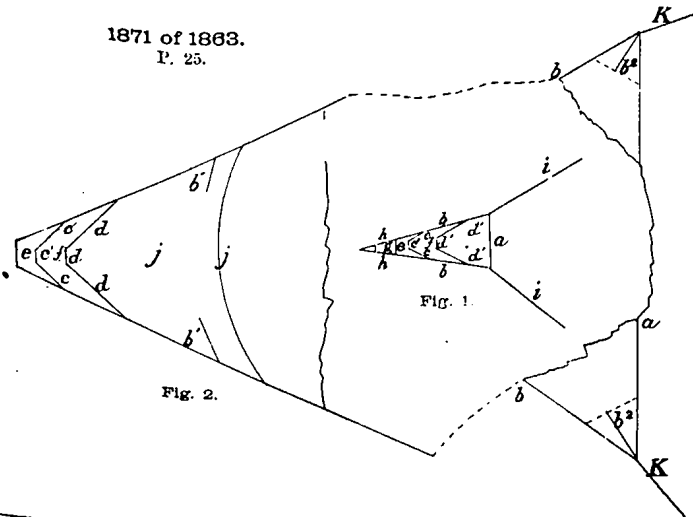
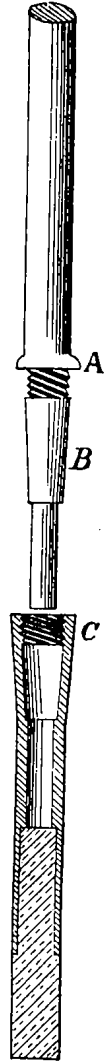
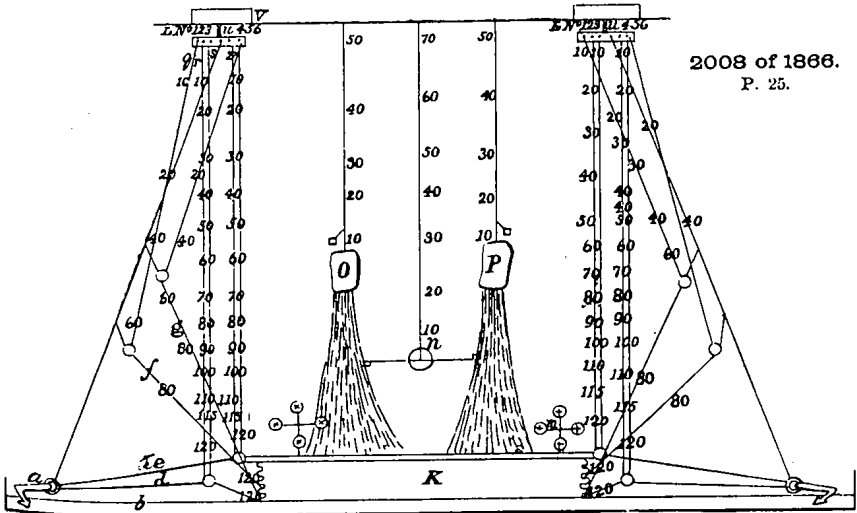


FIG. 1.

FIG. 2.





1146 of 1867.

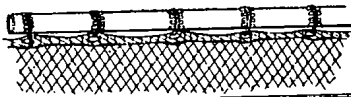


Fig. 7.

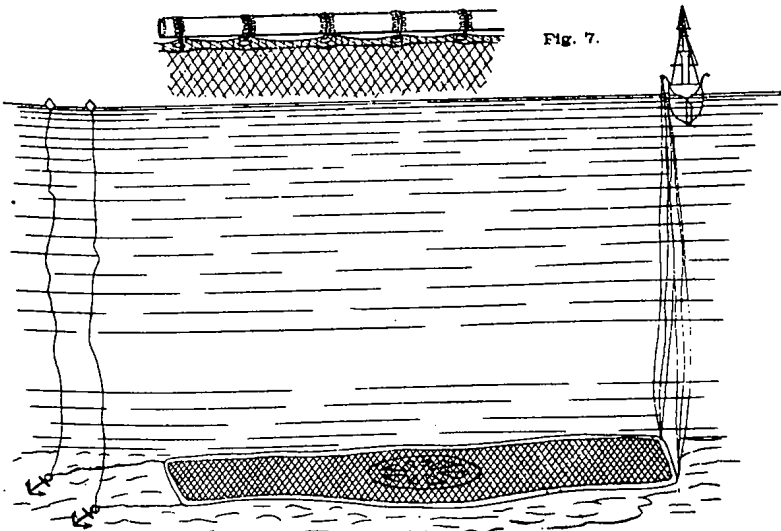


Fig. 8.

4103 of 1874.  
P. 27.



Fig. 3.

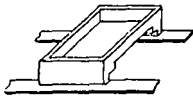


Fig. 4.

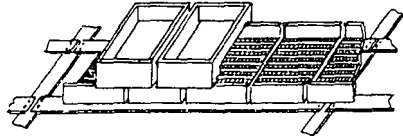


Fig. 6.

2470 of 1876.  
P. 27.

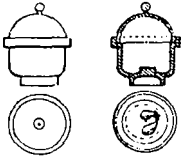


Fig. 1.

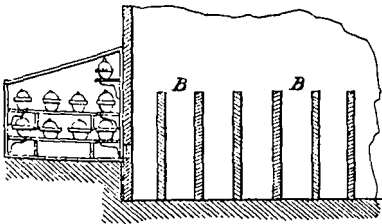


Fig. 6.

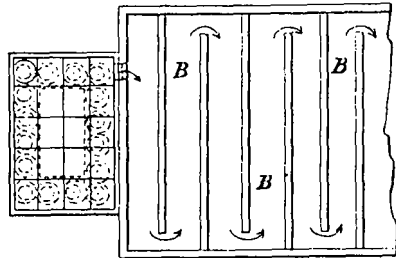


Fig. 7.

1040 of 1864.  
P. 27.

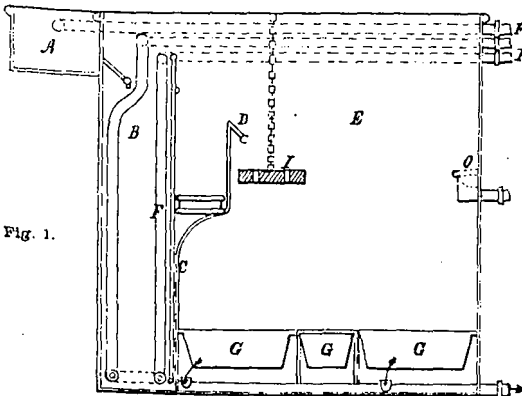


Fig. 1.



Fig. 2.

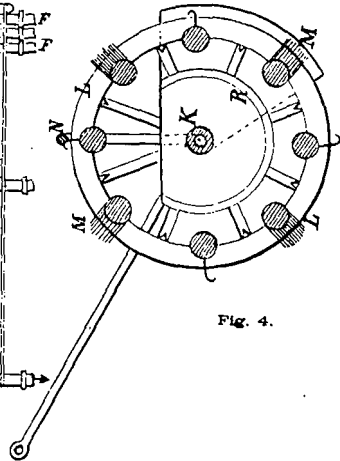


Fig. 4.

2171 of 1866.

P. 29.

Fig. 1.

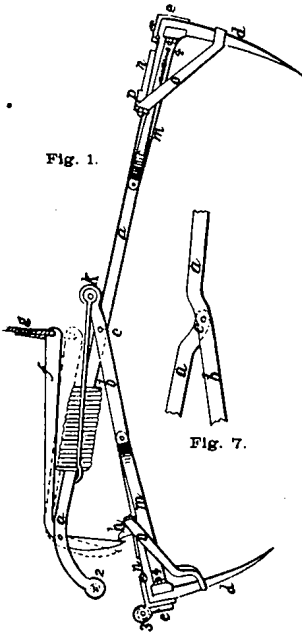


Fig. 7.



Fig. 8.

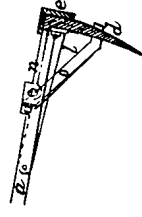


Fig. 4.

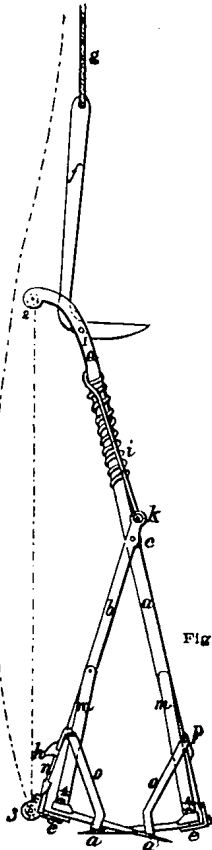
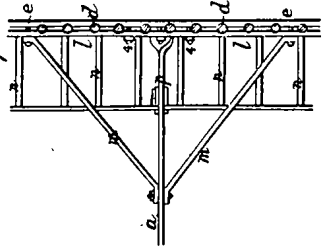


Fig. 2.

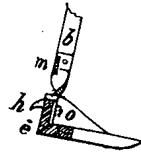


Fig. 6.

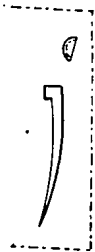


Fig. 5.

2906 of 1860.  
P. 20.

Fig. 3.

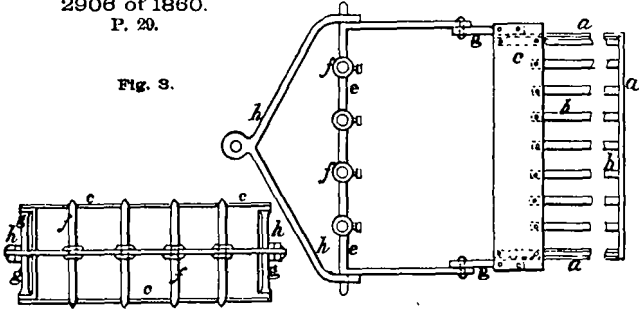
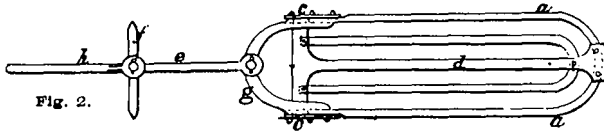


Fig. 2.



1553 of 1877.  
P. 32.

1438 of 1867.  
P. 20.

Fig. 2.

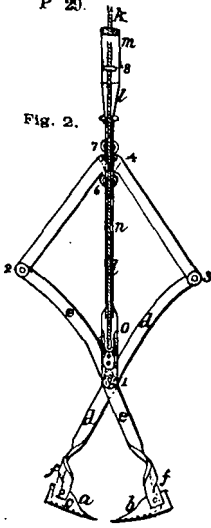


Fig. 3.

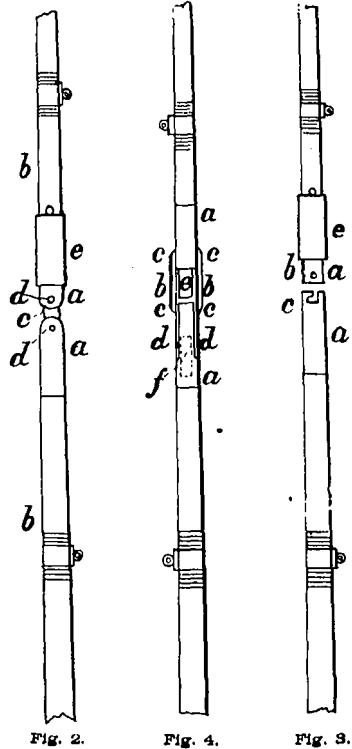
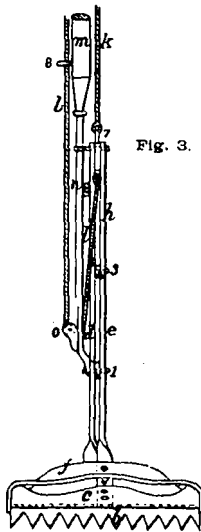


Fig. 2.

Fig. 4.

Fig. 3.

2644 of 1863.  
P. 29.

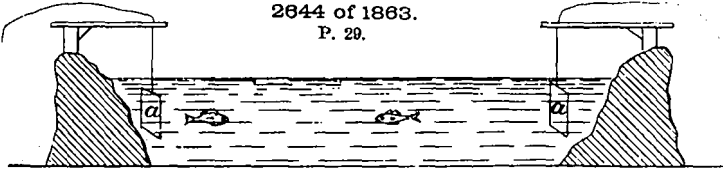


Fig. 1.

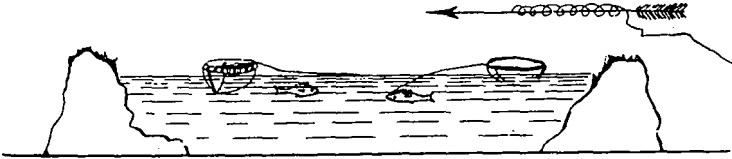


Fig. 4.

1956 of 1856.  
P. 30.

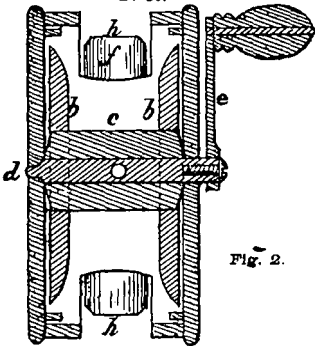


Fig. 2.

3157 of 1808.  
P. 30.

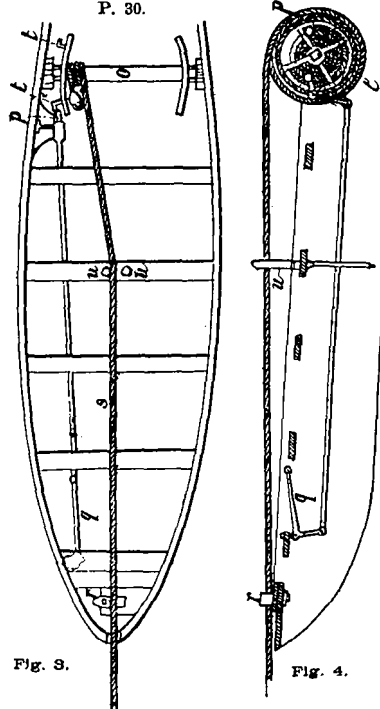
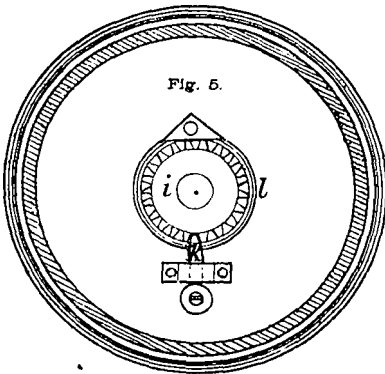


Fig. 3.

Fig. 4.

Fig. 5.



1316 of 1870.  
P. 27.

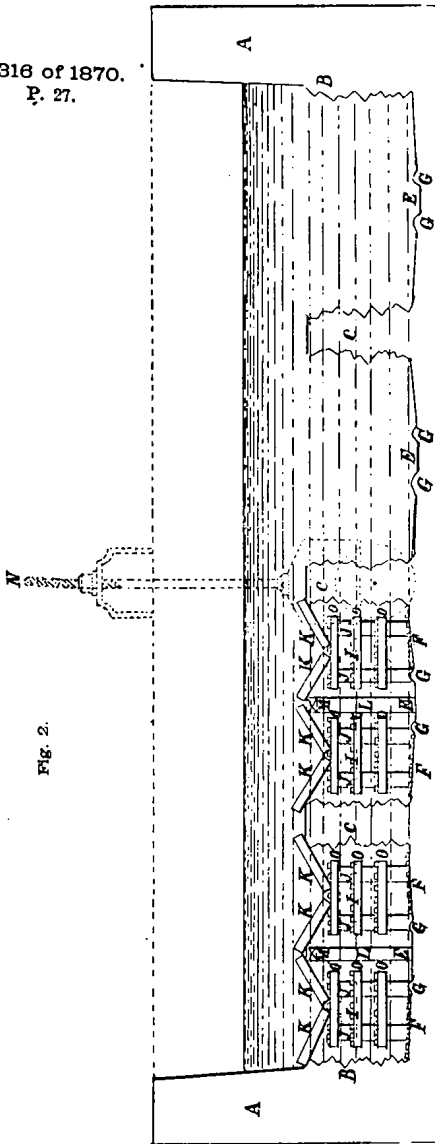


Fig. 2.

2966 of 1853.  
P. 30.

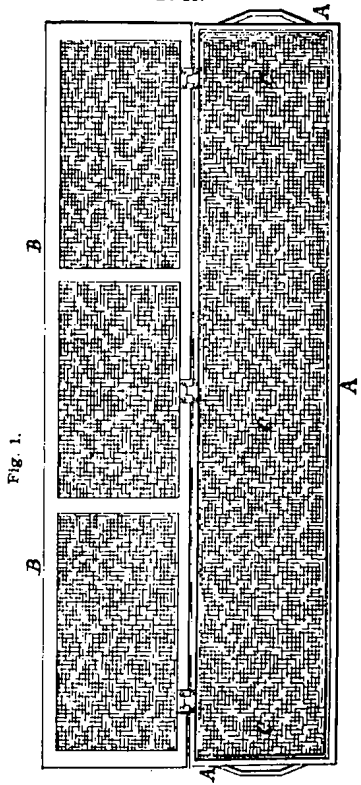


Fig. 1.

3506 of 1875.  
P. 27.

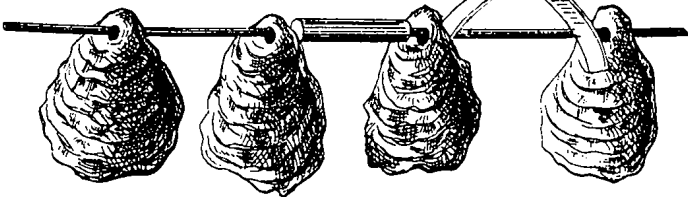


Fig. 3.



and allowing the rod to be folded up for portability when not required for use; but when required, the rod is unfolded and a tapered metallic tube which is over each joint is moved downwards, making it permanent or secure. The plate of metal may be constructed with a slot at one end in an oblique direction; in this case it would be hooked on to the pin, so that in case of one section of the rod being broken, another can with facility be substituted. Drawing, Plate XIV.

## TACKLE.

No. 881 of 1767.—COBB.—Long lines; small lines for snoods with hooks fixed thereon and small weights to sink the same. Small buoys prevent the hooks and bait touching the bottom of the sea, that the fish may readily discover the bait. No drawing.

No. 361 of 1858.—HECTOR.—Galvanized wire rope or lines and galvanized wire instead of the ordinary hemp ropes and materials. No drawing.

No. 1755 of 1866.—FRERE.—Barbed hooks connected to line attached to a spring whereby the line will be capable of yielding when pulled by the fish, and when his power is expended the fish will be drawn up. No drawing.

