A Releasing Apparatus for Horizontally Towed Plankton Nets.

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With 4 Figures in the Text.

WHILE experimenting on the vertical distribution of plankton in comparatively shallow waters I found it necessary to devise a releasing apparatus for use with horizontally towed plankton nets. Under existing working conditions there were four circumstances for which the instrument had to be adapted :—

1. Use with either a wire or rope warp of a thickness that would necessitate the loop and splice at its end being moderately bulky ; to overcome this difficulty the loop had to be "stowed away," so that it would not impede the messenger from striking the releasing cap.

2. Use with large tow-nets which would require heavy weights, and themselves cause considerable strain.

3. Room for the attachment of a large instrument for recording the depth at which the net was fishing.

4. Use with nets closed either by the "throttle-rope" or by a collapsible ring.

Examination of Figs. 1, 2, 3, and 4 will probably make the apparatus sufficiently clear to the reader, so that it is only necessary to give a brief description.

The instrument consists of four main portions : the "cap" (Figs. 1 and 2, A ; Figs. 3 and 4), the "swing-arm" (Figs. 1 and 2, B), and the two halves of the "body" (Figs. 1 and 2, C) ; in addition there are five bolts and nuts, a stop screw (Fig. 2, D), a short spiral spring

(Figs. 1 and 2, E), and a ring (Fig. 1, F), which will slide easily off the swing-arm.

The **cap** has on one side an elongated hole (Fig. 4, G) to take the

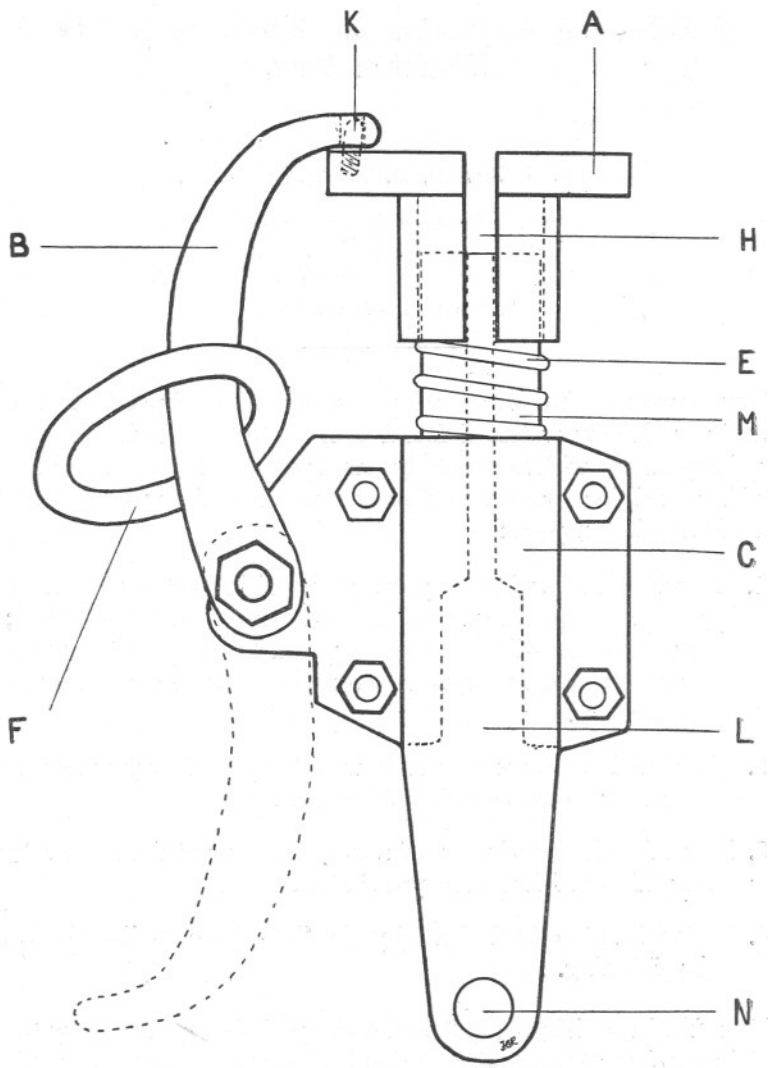


FIG. 1.—Releasing apparatus, side view. ×½.

A = "cap." F = ring. M = "neck."
B = "swing-arm." H = slot for insertion of wire. N = holes for bolt for attachment of warp, throttle-rope, etc.
C = "body." K = stud.
E = spring. L = enlargement of central boring to take loop of warp.

stop-screw, and on the opposite side a slot (Figs. 1 and 3, H) cut vertically along its whole length to allow the "cap" to be slipped on to the wire; at right angles to these, on the outer edge of the upper surface is the

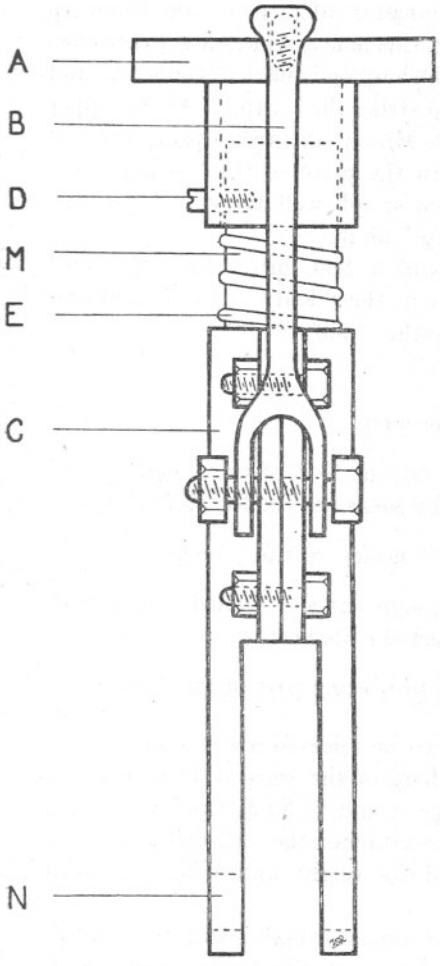
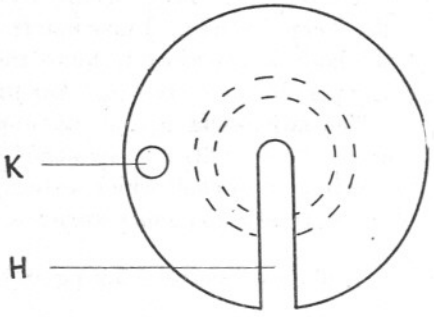


FIG. 2.

FIG. 2.—Releasing apparatus, front view. ×½.
A = "cap." D = stop-screw. N = holes for bolt for attachment of warp, throttle-rope, etc.
B = "swing-arm." E = spring.
C = "body." M = "neck."

FIG. 3.



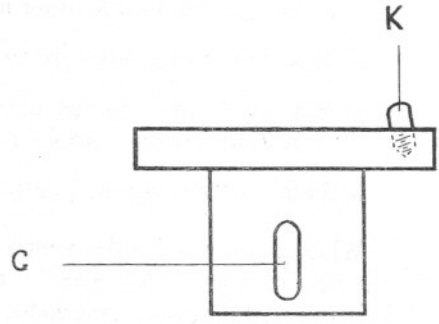


FIG. 4.

FIG. 3.—"Cap," top view. ×½.
H = slot for insertion of warp. K = stud.

FIG. 4.—"Cap," side view. ×½.
G = hole for stop-screw. K = stud.

stud (Figs. 1, 3, and 4, K), with which the swing-arm engages before it is released.

The **body** is made in two halves : these are clamped together, and a hole is drilled down the centre of a diameter sufficient to take the warp in use ; after a short distance, however, this hole is widened out considerably (Fig. 1, L, dotted lines), to take the loop and splice of the warp, and so to allow the messenger a free run to strike the " cap." At the upper end is a round " neck " (Figs. 1 and 2, M), on which the spring fits and the " cap " works. Immediately below the pivot of the " swing-arm " the body is cut away to allow the arm to fall well away, and prevent any possibility of the ring " hanging-up " on it.

The **swing-arm** has at its upper end a hole into which the stud on the " cap " fits : at its attachment to the " body " it is forked and it pivots on the bolt which fastens it to the " body."

To assemble and attach warp :—

1. Thread the spiral spring on to the warp.
2. Lay the warp down the groove on one half of the " body," and then fasten on the other half by means of the four bolts.
3. Slide the spring down on to the " neck " of the " body."
4. Slip the " cap " on the wire through the slot provided and push it down on the " neck " : insert the stop-screw.
5. Bolt the " swing-arm " on to the projecting part of the " body."

When in use the bridles which are to be released are shackled on to the ring on the " swing-arm " ; the loop of the warp is fastened to a bolt or shackle through the holes (Figs. 1 and 2, N) at the bottom end of the " body," and to this bolt are also attached the " throttle-rope," or closing bridles as the case may be, and the weight, and in this case also the depth-recorder.

When the messenger is sent down the impact it makes with the " cap " compresses the spiral spring, and thus disengages the " swing-arm " from the stud ; the " swing-arm " falls away to the position marked by dotted lines in Fig. 1, and allows the ring to slip off. The messenger used weighs 1 lb. 2 oz.

The whole is made of wrought iron, and painted except the bearing surfaces, which should be kept well greased, e.g. the " neck " and inside of " cap."

The instrument drawn here was designed to take $\frac{3}{4}$-in. (circumference) steel wire : for thicker wire or rope the hole passing down the centre should be drilled as required.

It has been found in practice that the process of attaching the apparatus to the warp can be considerably quickened by merely slacking off the five bolts and forcing the two halves apart : the loop of the wire can then be pushed down the drilled portion, and the nuts tightened up and the spring and " cap " slipped into place again. This allows the instrument to be kept assembled and prevents the likelihood of loss of the necessary bolts.