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Kahl

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[45] **Nov. 6, 1973**

[54] **HINGED IMPACT MESSENGER FOR MARINE EQUIPMENT**

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[52] **U.S. Cl.** ..... **114/221 R,** 43/17.2, 73/170 A

[51] **Int. Cl.** **B63c 11/00**

[58] **Field of Search** ..... 114/221 R; 73/170 A, 73/425.4; 43/17.2, 42, 49, 44.9; 16/1

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Assistant Examiner—Gregory W. O'Connor
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[57] **ABSTRACT**

An impact messenger for submerged apparatus has an open condition for being placed on a guide wire in a closed condition for downward travel along the guide wire. A spring loaded locking pin locks the device in the closed condition and has an arresting pin portion protected by a shoulder and prevented from slipping off by the inner edge of one fin of two diametrical fins. The fins and grooves in the outer surface of the device facilitate handling and increase the stability and descent speed during the drop.

11 Claims, 5 Drawing Figures

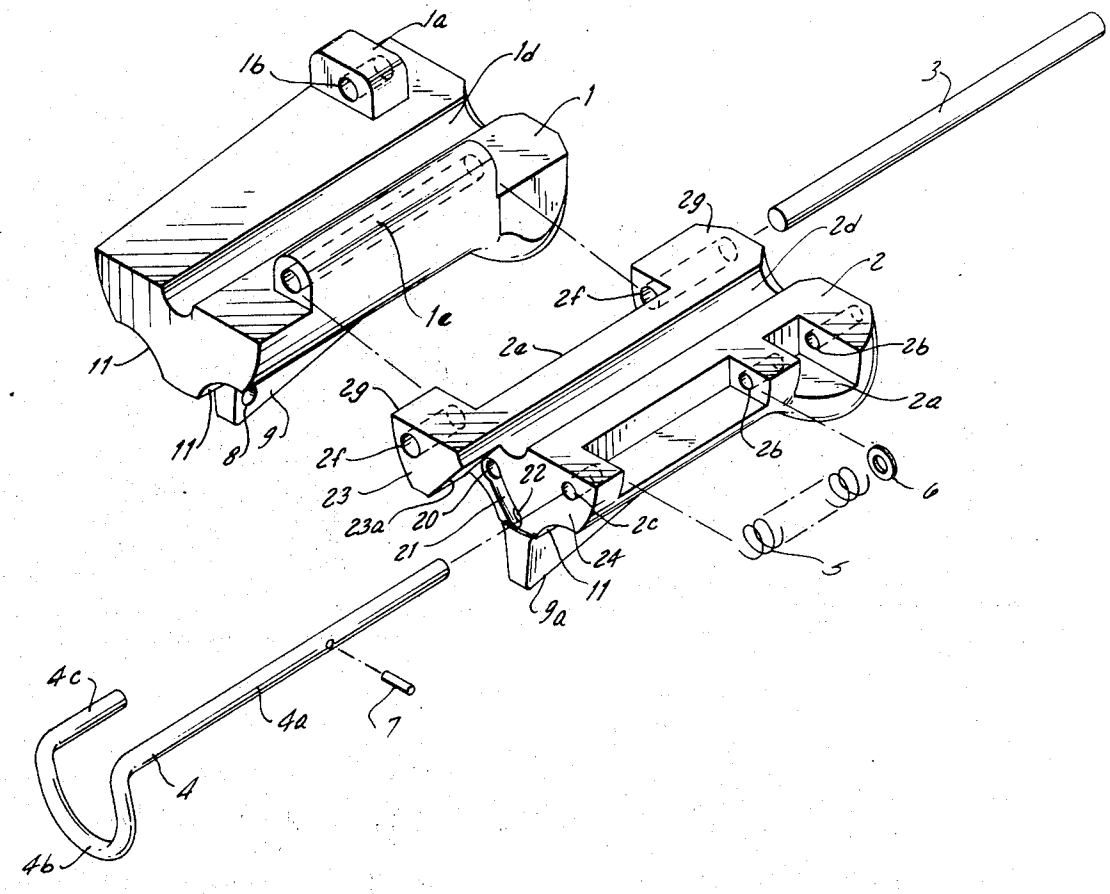


FIG. 1

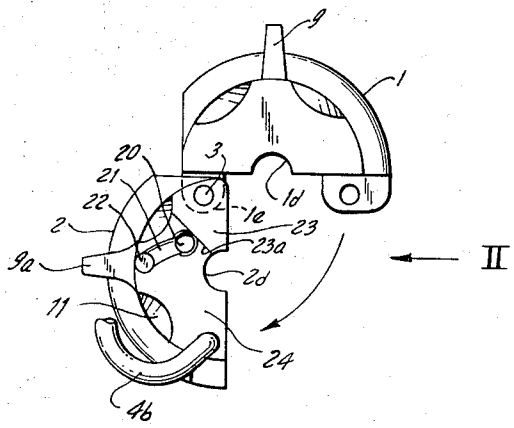


FIG. 2

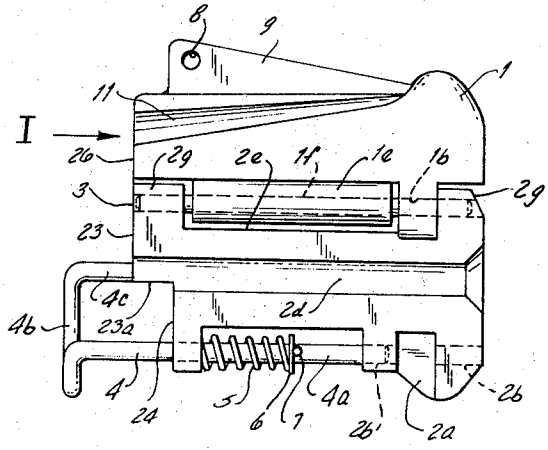
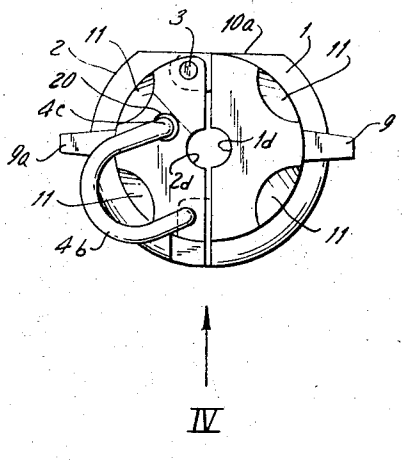


FIG. 3



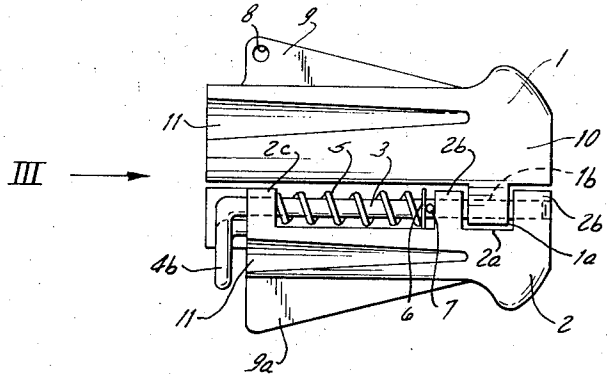

III
8
9
1
11
10
2c
5
3
2b
1b
2b
2a
1a
4b
11
6
7
2
9a

FIG. 4

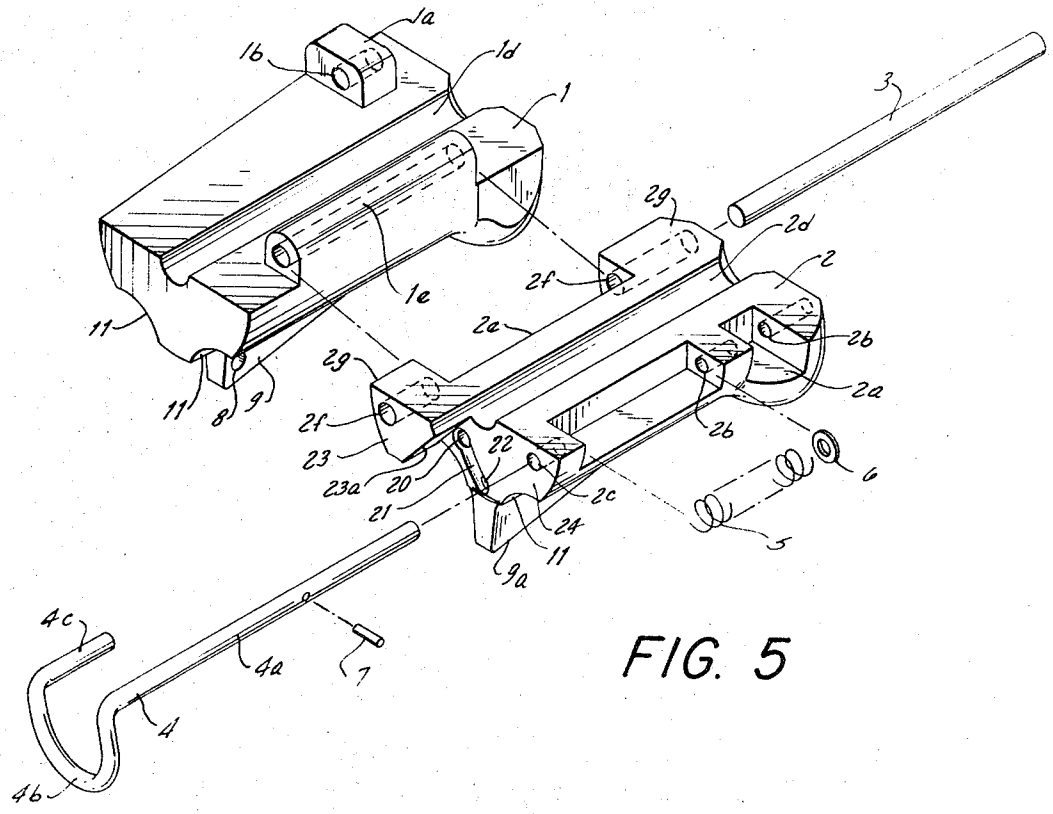

1a
1b
1d
1
3
2g
2d
2
2f
1e
2a
2b
11
2g
2a
11
8
9
2f
23
22
6
23a
20
2c
21
24
5
11
9a
4c
4a
7
4
4b

FIG. 5

HINGED IMPACT MESSENGER FOR MARINE EQUIPMENT

BACKGROUND OF THE INVENTION

My U.S. Pat. No. 2,462,268 discloses an impact messenger having two hingedly connected body sections which can be locked in a closed condition of the device. The outer surface of the device is cylindrical, so that it is difficult to open and close the device with one hand, while the water friction and the turbulence is high during the drop of the impact messenger to submerged apparatus, such as a bacteriological sampler.

It is one object of the invention to improve the impact messenger disclosed in U.S. Pat. No. 2,462,268 and to provide an impact messenger which can be easily handled and operated, and which drops along a guide wire without producing water turbulence, and without wobbling or turning on the guide wire.

Another object of the invention is to provide an impact messenger which drops at high speed.

Another object of the invention is to provide an impact messenger with stabilizing fins which not only guide the messenger during its drop, but also prevent rolling of the messenger when placed on a flat surface in storage or preparatory to use.

Another object of the invention is to provide an impact messenger which can be manually operated with the palm and fingers of one hand for easy opening, closing and placement on the guide wire as well as for attachment of its suspension wire.

Another object of the invention is to prevent the slipping off of an arresting portion of a locking pin by the inner edge of one of the fins.

Another object of the invention is to mount a manually operated locking pin in such a manner that the pin is protected against impact forces, particularly when one messenger is dropped on top of another, or when the device is dropped on a hard surface.

SUMMARY OF THE INVENTION

With these objects in view, an embodiment of the invention comprises first and second body sections hingedly connected for angular movement between open and closed conditions, and forming in the closed condition a guideway for a guide wire, the first and second body sections having first and second locking portions overlapping in the closed condition and having first and second bores aligned in the closed condition; and a locking pin having a locking pin portion, an arresting pin portion parallel with the locking pin portion, and a connecting pin portion.

The locking pin portion is mounted on the first body section for turning movement at least in the first bores between first and second angular positions, and for rectilinear movement between a locking position in which the locking pin portion is located in the aligned first and second bores in the closed condition, and an unlocking position retracted from the second bore so that the body sections can be moved between the open and closed conditions.

Spring means are provided for biassing the locking pin toward the locking position.

In accordance with the invention, the first and second body sections have radially projecting first and second fins, respectively, and the first body section has a first end face formed with a bore in which the arresting pin portion is located in the first angular position for

longitudinal movement to the locking position, and an arresting recess adjacent the inner edge of the first fin so that angular movement of the locking pin is blocked in the second angular position by the inner edge of the first fin.

In accordance with the invention, the first end face of the first body section has a higher face portion flush with the second end face, and a lower face portion separated by shoulders from the higher face portion and from the second end face. The lower face portion has the bore and the arresting recess which cooperate with the arresting pin portion of the locking pin. Due to the position of the connecting portion and arresting portion under the higher face portion and the second end face, they are protected in the closed condition of the device.

Preferably, the body sections form together a bulbous head leading during a drop of the messenger along guide wire and reducing water friction. The first and second body sections are preferably formed on the outer surface thereof with forwardly tapering grooves located between the fins, and to reduce water turbulence thereby permitting a faster descent.

The connecting pin portion is preferably semicircular and transverse to the parallel locking pin portion and arresting pin portion, so that the locking pin can be easily operated by one finger.

The arresting pin portion can be turned about the axis of the locking pin portion between an angular position cooperating with the bore in the lower end face portion, and another angular position limited by the inner edge of the first fin and preferably located in a shallow recess so that the locking pin is arrested in the retracted unlocking position. Preferably, a shallow circular groove having the center in the axis of locking pin portion connects the bore and the recess with which the arresting pin portion cooperates.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a view in the direction of the arrow I in FIG. 2, and illustrating an embodiment of the invention in a partly open condition;

FIG. 2 is a side view taken in the direction of the arrow II in FIG. 1;

FIG. 3 is an end view taken in the direction of the arrow III in FIG. 4, and illustrating the closed condition;

FIG. 4 is a bottom view taken in the direction of the arrow IV in FIG. 3; and

FIG. 5 is an exploded perspective view.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, a hinged impact messenger according to the invention has two body sections 1 and 2 connected by a hinge pin 3 for angular movement between the open condition shown in FIGS. 1 and 2, and the closed condition shown in FIGS. 3 and 4. The body section 2 has two projections 2g with

aligned bores 2*f* in which hinge pin 3 is secured, and body section 1 has a projection 1e through which a corresponding bore 1f for the hinge pin 3 passes. Body section 1 has on the outer surface a substantially triangular fin 9 which is wider at the trailing end than at the leading end of the device, and is provided with a hole 8 to which a suspension wire may be secured. Body section 2 has a corresponding fin 9*a*, the fins being located in a diametrical plane when the device is in the closed condition shown in FIGS. 3 and 4. The leading pair of ends of body sections 1 and 2 is shaped to form in the closed condition a bulbous head 10. Rearwardly of the bulbous head 10, tapered grooves 11 are formed on the outer surface of body sections 1 and 2 on opposite sides of the fins 9 and 9*a*, as best seen in FIGS. 3 and 4.

The body section 1 has a locking projection 1a which fits in the closed condition of the device into a corresponding recess 2*a* of the body section 2 which has two locking projections on opposite sides of recess 2*a* provided with aligned bores 2*b*. When the locking projection 1*a* is located in the locking recess 2*a*, a bore 1*b* in locking projection 1*a* is aligned with the bores 2*b*.

A locking pin 4 is provided which has a straight long locking pin portion 4*a* passing through the bore 2*c* and into one bore 2*b* when the device is in the open condition shown in FIG. 2. When the device is in the closed condition and projection 1*a* located in recess 2*a*, the locking pin 4 moves farther and passes through the bore 1*b* in locking projection 1*a* and through the other bore 2*b* in the head portion, so that the device is locked in the closed condition shown in FIGS. 3 and 4. A curved connecting pin portion 4*b* connects the long locking pin portion 4*a* with a short arresting pin portion 4*c* which is parallel to locking pin portion 4*a*. The end of body section 1 remote from the head 10 has a flat end face, and the bulbous head 10 has a corresponding flat end face. The end face of body section 2 has a higher planar face portion 23 flush with the end face 26 of body section 1, and a lower face portion 24, separated from end face portion 23 by a shoulder 23*a*.

The lower end face portion 24 has a blind bore 20, and the locking pin 4 can be turned in bores 2*b* and 2*c* to an angular position in which the arresting pin portion 4*c* drops into the bore 20 due to the action of the spring 5 which is secured by a washer 6 and a pin 7 to the locking pin portion 4*a*. Spring 5 abuts a portion of body section 2 so that the locking pin 4 is urged to the locking position shown in FIG. 2, and when arresting pin portion 4*c* is located aligned with the bore 20, spring 5 moves the locking pin 4 to the locking position in which pin portion 4*a* passes through the bore 1*b* of the male locking projection 1a, provided that the body sections 1 and 2 are in the closed condition shown in FIG. 3.

When locking pin 4 assumes this locking position, shown in FIG. 4, the device is locked in the closed condition so that the grooves 1*d* and 2*d* of the body sections 1 and 2 form a central guideway through which a vertical cable or wire, not shown, passes for guiding the device during a drop into a body of water so that the bulbous head 10 of the device exerts an impact on a submerged apparatus, for example, a bacteriological sampler, to cause an operation of the same.

As best seen in FIGS. 1 and 5, a part-circular groove 21, whose center is located in the axis of the locking pin portion 4*a*, connects bore 20 to a recess 22 in the lower end face portion 24.

When the locking pin 4 is longitudinally moved from the locking position shown in FIG. 4 to the unlocking position shown in FIG. 2 in order to unlock the device, the arresting pin portion 4*c* is lifted out of the bore 20, so that finger pressure on the connecting portion 4*b* is sufficient for turning the locking pin 4 to an angularly displaced position in which the end of the arresting pin portion engages the arresting recess 22 after moving along the groove 21.

The recess 22 is directly adjacent the inner edge of the fin 9*a*, so that the arresting pin portion 4*c* cannot be pushed over the edge of the lower face portion 24. Similarly, when the locking pin 4 is turned in clockwise direction as viewed in FIG. 1 about locking pin portion 4a to the other angular position, the shoulder 23*a* stops the arresting pin portion 4*c* when the same is located aligned with the bore 20 so that the arresting pin portion drops into bore 20 due to the action of the spring 5. Normally, the locking pin 4 is only turned to this angular position after the two body sections 1 and 2 have been moved about the hinge pin 3 to the closed position shown in FIGS. 3 and 4, so that the device is locked in the closed condition for downward travel along a guide wire passing through the guideway formed by the grooves 1*d* and 2*d*.

When the device has been returned by hauling up the guide wire, finger pressure on the connecting portion 4*b* is sufficient for lifting the locking pin portion 4*a* out of the bore 1*b* in the locking projection 1*a*, and for simultaneously lifting the arresting pin portion 4*c* out of the bore 20, permitting turning of the arresting pin portion 4*c* along the groove 21 to a position engaging the recess 22 and the inner edge of fin 9*a*, so that the locking pin 4 is held in the unlocking position, permitting opening of the body sections 1 and 2. Connecting pin portion 4*b* is semi-circular and located in a plane perpendicular to the arresting and locking pin portions 4*c*, 4*a* for easy manual operation.

When pin 4 is disengaged from bore 20 by the thumb, the thumb may be used to spread body sections 1 and 2 apart by manual pressure of fin 9*a;* the messenger may then be placed on the guide wire while still held in the palm of the hand, sections 1 and 2 snapped shut on the guide wire and pin 4 moved by the thumb to its locked position, retaining the messenger on the guide wire. If required for subsurface use, the suspension wire of fin 9 may be attached to the messenger release device provided on the sampler, using thumb and forefinger while still held in the palm of the hand.

During the drop in the closed condition along the guide wire, the leading bulbous head 10 changes the water flow pattern so that water flows away from the leading end of the messenger reducing water friction which results in a greater speed during descent. The bulbous head 10 has the effect that the center of gravity is brought closer to the leading end whereby vibration is reduced due to a hydrodynamic effect. The rearwardly flaring and forwardly tapering grooves 11 on either side of fins 9 and 9*a*, reduce the area of water contact and increase the speed of the descent, while assisting in stabilizing the impact messenger for preventing lateral movements on the guide wire.

The fins 9,9*a* serve as a guide during the descent and prevent angular displacement and rotation of the impact messenger dropping down the guide wire. The fins also increase the descent speed and minimize vibration on the guide wire so that wear of the wire, and also

wear and enlargment of the guideway 1*d*,2*d* are prevented. The minimal area of contact between messenger and guide wire, induced by fins 9 and 9*a* during descent, reduces friction and permits a faster descent speed.

The fins 9,9*a* are wider at the rear end than in the region of the bulbous head 10, which permits the suspension wire to be secured to the hole 8 at the rear end of fin 9 at the lateral extremity of the device, so that the possibility of fouling of the suspension wire during descent is minimized.

The wide rear portions of fins 9,9*a* protect the connecting portion 4*b* of the locking pin 4 when the device is thrown into a box with similar devices after detachment from the guide wire.

The locking pin 4 and particularly the connecting portion 4*b*, is further protected from damage when thrown into a box, by being placed at the lower end face 24 protected by shoulder 23*a*. The higher end face portion 23, and the corresponding end face portion 26 of the body section 1 receive an impact while the connecting portion 4*b* is protected by the shoulder 23*a*. Should a second messenger drop along the guide wire and hit the top area of a preceding impact messenger, such impact cannot act on the connecting pin portion 4*b* of the locking pin 4. It is sometimes necessary to drop two successive impact messengers, so that the first starts an operation, and the second stops the respective operation of submerged equipment.

Due to the irregular shape produced by the fins 9,9*a*, grooves 11, and bulbous head 10, the device can be easily held in one hand, even with a gloved hand, as required in the arctic, so that the other hand is free to grasp a safety line or the like. Particularly the fins increase the holding capability.

The shallow part circular groove 21 connecting the bore 20 with the recess 22 makes it easy to lock the device by pushing the curved connecting portion 4*b* of locking pin 4 with the thumb of the holding hand.

The two body sections 1,2 of the device are flattened laterally in the region of the bulbous nose as shown at 10*a* in FIG. 3 to allow opening without difficulty. A machining operation is not required if the two body sections 1 and 2 are cast with smooth surfaces which also reduces the number of other machining operations.

The fins 9,9*a* not only prevent rotation during the drop along the guide wire, but also rolling of the device on a flat table, or rolling against other instruments in the same container.

By placing the recess 22 at the end of the groove 21 so that it terminates at the edge of the fin 9*a*, the end of the arresting portion 4*c* of the locking pin 4 is stopped by the inner edge of fin 9*a*, which is slightly higher than recess 22 and groove 21. Fin 9*a* acts as a stop preventing the arresting pin portion 4*c* from sliding off the face 24. The shallow recess 22 prevents accidental movement of the arresting pin portion 4*c* into the bore 20 which would cause movement of the locking pin 4 to the locking position by spring 5 and prevent closing of the device since the projecting portion 1*a* could not move into the locking recess 2*a* in which the end portion of locking pin portion 4*a* would be located.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of impact messengers differing from the types described above.

While the invention has been illustrated and described as embodied in an impact messenger for submerged marine equipment having fins, one of which blocks movement of a locking pin in an arrested position, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims.

I claim:

1. A hinged impact messenger for marine equipment, comprising first and second body sections hingedly connected for angular movement between open and closed positions, and forming in said closed position, a guide way for a guide wire, said first and second body sections having first and second locking portions overlapping in said closed position and having first and second bores aligned in said closed position; a locking pin having a locking pin portion, an arresting pin portion parallel with said locking pin portion, and a connecting pin portion, said locking pin portion being mounted on said first body section for turning movement at least in said first bores between first and second angular positions, and for rectilinear movement between a locking position in which said locking pin portion is located in said aligned first and second bores in said closed position and an unlocking position retracted from said second bore so that said body sections can be moved between said open and closed positions; and spring means for biasing said locking pin toward said locking position; said second body section having a second end face and said first body section having a first end face including a higher face portion flush with said second end face and a lower face portion separated by shoulders from said higher face portion and from said second face, said lower face portion being formed with a bore in which said arresting pin portion is located in said first angular position for movement of said locking pin to said locking position, and with an arresting recess for engaging the end of said arresting pin portion in said second angular position of said locking pin due to the force of said spring means, said connecting pin portion being located under a plane passing through said higher face portion and said second end face when said locking pin is located in said locking position so that said arresting and connecting pin portions are protected by said shoulders in said closed position of said first and second body sections.

2. An impact messenger as claimed in claim 1 wherein said first and second body section have one pair of ends provided with said first and second end faces, and a second pair of ends forming a bulbous head leading during a drop of the messenger along said guide wire into water for reducing water friction.

3. An impact messenger as claimed in claim 2 wherein said higher face portion and said second end

face are planar and flush; and wherein said bulbous head has a planar end face.

4. An impact messenger as claimed in claim 1 wherein said end faces are located at the trailing end of said first body section; wherein the leading ends of said first and second body sections are formed as a bulbous head for reducing water friction; and wherein said first and second body sections are formed on the outer surfaces thereof with fins, respectively, and tapered grooves located rearwardly of said head on opposite sides of each fin.

5. An impact messenger as claimed in claim 4 wherein said fins are triangular and wider at the trailing ends than at the leading ends of said first and second body sections.

6. An impact messenger as claimed in claim 4 wherein at least one fin has a hole at the trailing end thereof for attachment of a suspension wire.

7. An impact messenger as claimed in claim 1 wherein said arresting pin portion and said locking pin portion are parallel, and wherein said connecting pin portion is semi-circular and located in a plane transverse to said parallel pin portions.

8. An impact messenger as claimed in claim 1 wherein said first end face has a part circular groove between said recess and said bore having the center thereof in the axis of said locking pin portion.

9. A hinged impact messenger for marine equipment, comprising first and second body sections hingedly connected for angular movement between open and closed conditions, and forming in said closed condition a guideway for a guide wire, said first and second body sections having first and second locking portions overlapping in said closed condition and having first and second bores aligned in said closed condition; a locking pin having a locking pin portion, an arresting pin portion parallel with said locking pin portion, and a connecting pin portion, said locking pin portion being mounted on said first body section for turning movement at least in said first bores between first and second angular positions, and for rectilinear movement between a locking position in which said locking pin portion is located in said aligned first and second bores in said closed condition, and an unlocking position retracted from said second bore so that said body sections can be moved between said open and closed conditions; and spring means for biassing said locking pin toward said locking position; said first and second body sections having radially projecting first and second fins, respectively, said first body section having a first end face formed with a bore in which said arresting pin portion is located in said first angular position for movement of said locking pin to said locking position, and an arresting recess adjacent the inner edge of said first fin so that angular movement of said locking pin is blocked in said second angular position by said inner edge of said first fin.

10. An impact messenger as claimed in claim 9 wherein said second body section has a second end face; and wherein said first end face has a higher face portion flush with said second end face, and a lower face portion separated by shoulders from said higher face portion and from said second end face, said lower face portion having said bore and said arresting recess so that said arresting pin portion and said connecting pin portion are protected in said closed condition.

11. An impact messenger as claimed in claim 9 wherein said first and second body sections are formed on the outer surfaces thereof with tapered grooves located between said fins for minimizing water turbulence and friction.

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