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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
INVENTARIO

Delegatura de propiedad Industrial

División de Nuevas Creaciones

PCT

SOLICITUD

PATENTE DE INVENCIÓN

1. **EXPEDIENTE No.** 08-76131

4. **TÍTULO** *PLATAFORMA DE ESTRUCTURA FIJA EN AGUA.*

1. **CLASIFICACIÓN INTERNACIONAL**

1. **SOLICITANTE** *INCE, ALPAY*

DOMICILIO *MALTEPE, ISTANBUL, TURQUIA.*

4. **APODERADO** *DILIA RODRIGUEZ D'ALEMAN*

2. **BOGOTÁ, D. C.,** 202099

ORMA P-10)

Industria y Comercio
SUPERINTENDENCIA

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
No. 08-076131- -00000-0000
Fecha: 2008-07-23 15:01:56 Dep. 2020 NUECREACIONI
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 69

FORMULARIO ÚNICO DE SOLICITUD DE PATENTE
PCT
ENTRADA EN FASE NACIONAL

23 julio 2008

1 SOLICITUD DE:

[X] Patente de Invención [ ] Patente de Modelo de Utilidad

[X] Capítulo I [ ] Capítulo II

2 SOLICITANTE (71)	**Nombre:** INCE, Alpay **Dirección:** Eski Bagdat Cad. Gencaslan Apt. No. 9/8, Altintepe / Kucukyali, Maltepe, Istanbul, Turquia. **Nacionalidad o domicilio:** Maltepe, Istanbul, Turquia **Lugar de Constitución:** **Teléfono:** **Fax:** **E-mail**	**IDENTIFICACIÓN** C.C. [ ] NIT [ ] C.E. [ ] Otro [ ] **Número**
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5 PCT (86)

Solicitud Internacional No: **PCT/TR2006/000072** Fecha **20 de diciembre de 2006**

Publicación Internacional No: **WO 2007/073359 A2** Fecha **28 de junio de 2007**

6 TITULO (54) **PLATAFORMA DE ESTRUCTURA FIJA EN AGUA**

7 Clasificación Internacional (51) No clasificada

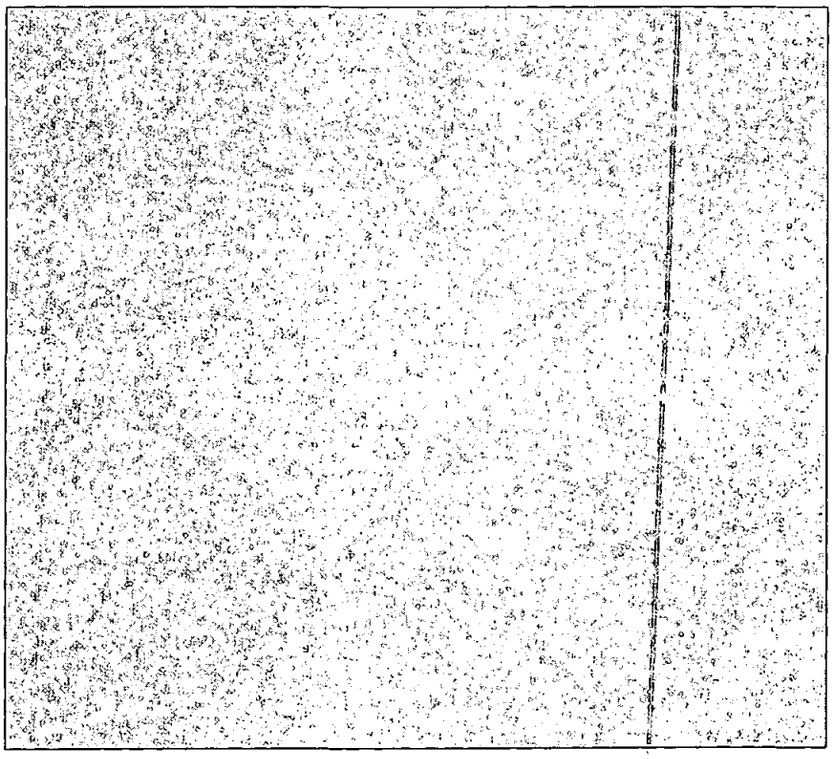
8 Prioridad SI [X] NO [ ]	(33) País de Origen	(32) Fecha	(31) Número de Solicitud
	TURQUIA	**23 de diciembre de 2005**	**2005/05181**

9 Comprobante de pago No: 08 - 54.004 **Fecha** 8 de julio de 2008

10 ANEXOS

- [ ] Comprobante de pago de la tasa de presentación de la solicitud
- [ ] Documento que acredita la existencia y representación legal cuando el solicitante sea persona jurídica
- [ ] Poderes si fuere el caso
- [ ] Documento de cesión del inventor al solicitante o a su causante
- [ ] Declaraciones
- [x] Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- [x] Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- [ ] Copia del examen preliminar internacional efectuado por la Autoridad Internacional de Examen Preliminar (IPEA).
- [ ] Traducción del examen preliminar internacional efectuado por la IPEA
- [ ] De ser el caso copia de contrato de acceso.
- [ ] De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas
- [ ] De ser el caso, certificado de deposito del material biológico
- [ ] Arte final 12 X 12 .
- [ ] De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- [ ] De ser el caso, modificaciones efectuadas a la solicitud internacional
- [x] Otros pinión escrita.

11 FIGURA CARACTERÍSTICA



12 Solicito la concesión de la patente

NOMBRE : DILIA MARÍA RODRÍGUEZ D'ALEMAN

FIRMA:

C.C. 41.654.882 T.P. 20824

As. P-1316

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

No. 08-076131- -00000-0000

Fecha: 2008-07-23 15:01:56 Dep. 2020 NUECREACIONI
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 69

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 08 - 54,004
FECHA : JULIO 8 DE 2008

***** C O N S I G N A C I O N *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CLARKE MODET Y CO. COLOMB	CONSIGNACION	BANCO DE BOGOTA	062754387	79508623	08/07/2008	41,350,000.00

***** C O N C E P T O *****

CANT.	RENTISTICO	CONCEPTO		TOTAL CONCEPTO
1	50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE IN		501,000.00
		TOTAL :	$	501,000.00

SON: QUINIENTOS UN MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No._____

P-1316

2

TRADUCCION: P-1316

TITULO: PLATAFORMA DE ESTRUCTURA FIJA EN AGUA.

RESUMEN: El invento se relaciona con una plataforma fija que permite localizar sobre el agua cualquier tipo de estructura fija tal como casas, jardines, carreteras, aeropuertos, parqueaderos, parques infantiles y villas de recreación y descanso sobre mares, lagos y ríos. Nuestro invento abarca la plataforma (7) sobre los flotadores (22) capaces de flotar son sumergidos a una zona segura entre 3 y 5 m del nivel de la superficie del agua (10), los flotadores (22) que consumen energía al tratar de emerger a la superficie del agua (5) producen fuerzas que mantienen la plataforma (7) siempre en el mismo punto, debido a la tensión de las cuerdas o cables (3) sobre el flotador (22) es posible prevenir que la mencionada plataforma (7) se desplace a causa de tormentas violentas, grandes olas y corrientes marinas en donde la plataforma (7) que es manufacturada de una forma apropiada para su propósito abarca los pesos o lastres (4) que son conectados mediante cuerdas o cables (3) utilizados para mantener los flotadores (22) a una distancia constante del piso en un estado sumergido, los flotadores (22) producen la flotabilidad que soporta la plataforma (7), las columnas portantes (21) conectan los flotadores (22) con la plataforma (7) y las piezas conectoras (20) unen las columnas (21) con la plataforma (7).

DESCRIPCION

PLATAFORMA DE ESTRUCTURA FIJA EN AGUA

La presente invención se relaciona con técnicas de estructuras fijas tales como cualquier tipo de casa, jardín, camino, aeropuerto, aparcamiento, parques de niños y villas de descanso construidas sobre el agua en mares, lagos y ríos.

Ha llegado a ser muy importante ganar la tierra de los mares en los países como Japón, donde hay escasez de la tierra en las islas y en asentamientos costeros estrechos. Particularmente, la capacidad de construir aeropuertos y estacionamientos en los mares absolutamente vacíos y de construir autopistas entre las islas y entre las costas y las islas ha adquirido importancia vital. Se han efectuado numerosos estudios y actualmente se continúan realizando en este campo.

De acuerdo con el arte previo, básicamente se han utilizado dos sistemas en las estructuras sobre agua. Uno de éstos es el sistema flotante. Estos sistemas utilizan los principios de flotación en la física. Tales sistemas constan de flotadores de acero, pantallas de pontones en concreto llenados de espuma o de otros elementos flotantes dentro de los cuales se retiene el aire y son entonces más ligeros que el agua. Los aeropuertos y puentes flotantes, las plataformas petroleras etc. son ejemplos de éste tipo. El segundo sistema es el sistema de estacas o pilotes. Éstos implican la utilización de pilotes de concreta o acero en el lecho de los mares, lagos o ríos, para proporcionar las estructuras dentro del agua. Los muelles, caminos, los puentes, etc. basados en el sistema de estacas o pilotes son ejemplos de tales sistemas. En esta técnica, la flotabilidad del agua no es importante. 1/4 de la superficie de la tierra está cubierta por los continentes. Una gran proporción de la superficie de tierra cubierta con los continentes abarca las montañas, corrientes, lagos, bosques, campos agrícolas, desiertos y regiones excesivamente secas, calientes o frías inadecuadas para la urbanización. En este caso, resulta muy importante ganar tierra de los mares y de los lagos en regiones convenientes para el asentamiento de la gente.

En los sistemas flotantes según el arte previo, las fluctuaciones en la superficie del agua y las subidas y las caídas del nivel del agua influyen directamente la plataforma flotante. Para proteger las plataformas flotantes contra los efectos de la deriva, éstas se

anclan a pesos o lastres ubicados en el piso. Teniendo en cuenta que estos cables tensores de acero podrían romperse debido a los cambios en el nivel del agua y las oscilaciones de las olas en caso de que éstas se encuentren incluso levemente apretadas, las cuerdas entonces se mantienen ajustadas en un estado flojo. Tal práctica también conlleva a serios problemas las conexiones de los sistemas flotantes a tierra. Otro problema que se presenta son las torceduras y las roturas en la plataforma debido al movimiento de las olas. Este impacto depende directamente de la amplitud de las olas, de su longitud y del cambio en el nivel del agua. Las torceduras, las zanjas longitudinales, la existencia de agua sobre la pista y las sacudidas debido al oleaje pueden hacer imposible que los aeroplanos aterricen en la pista. Las zanjas, torceduras y las sacudidas son muy poco tolerables para un aeroplano que aterriza en la pista a una velocidad superior a los doscientos kilómetros por hora. En consecuencia, las plataformas colocadas en los flotadores y pontones a veces hacen imposible tener una estructura adecuada en donde pueda aterrizar un aeroplano. Por ejemplo, el proyecto de pista flotante desarrollado para ampliar el aeropuerto de San Francisco titulado " Propuesta de expansión de pista flotante de San Francisco; (página Web www.floatinc.com) fue rechazado por las mencionadas razones técnicas en el año 1999. Por una parte, una pista flotante de 1 kilómetro de largo fue construida en la bahía de Yokosuku en Tokio para aeroplanos pequeños en una bahía protegida con una muy baja cantidad de olas. Este proyecto de aeropuerto titulado " Construcción de Mega pista flotante de 1 kilómetro de largo del puerto de Yokosuka en la bahía de Tokio" (www.nkk.co.ip/en/) fue efectuado en el año-2000. Las conexiones de este proyecto entre la plataforma y la orilla generaron problemas debido a los incrementos y disminuciones del nivel del agua, y las torceduras longitudinales en la pista y las zanjas longitudinales como resultado de las oscilaciones causadas por el viento, presentando dificultades técnicas. En todas las aplicaciones de plataformas sobre el agua que empleas flotadores y pontones de concreto, y aquellos con un lado inferior abierto con aire encerrado dentro, las ondas superficiales actúan en el sistema del monobloque desde diversos ángulos y con diversas fuerzas. Los cálculos estáticos y dinámicos de las acciones mencionadas son extremadamente complicados. No sólo en cuanto a las olas sino también en cuanto a las corrientes superficiales y las alas afectan a los sistemas

flotantes. Las pesadas alas imparten fuerzas de fricción horizontales en las diferentes partes de los sistemas flotantes situados en el agua. Al mismo tiempo, las ondas formadas por los fuertes vientos elevan las fuerzas impartidas en las plataformas flotantes a niveles peligrosos. No es fácil en absoluto hacer frente a tales fuerzas. En casi todas las prácticas según arte anterior, los ingenieros, arquitectos, mecánicos han trabajado arduamente en los cálculos y las construcciones para oponerse a tales fuerzas mecánicas y cinéticas. Considero esencial repetir por este medio la idea principal de mi invención acotada a continuación para permitir una mejor comprensión de los problemas. " Pensé entonces, que podría ser posible librarse de estos problemas sumergiendo a la fuerza los flotadores y pontones mas ligeros que el agua a una profundidad entre 3 y 5 metros de la superficie, con el objeto de evitar totalmente las complicadas fuerzas de las olas, para eliminar totalmente los impactos de los fuertes vientos y para evitar en gran parte las influencias de las corrientes superficiales." Los flotadores y los pontones sumergidos a la fuerza usando un peso mayor al de su flotabilidad no sueltan afectan su flotabilidad. Se pueden lograr muchas ventajas moviéndolos a un nivel de agua donde su flotabilidad se mantiene, pero son protegidos de los efectos de las olas de superficie, de las corriente superficiales y los fuertes vientos; por lo tanto gracias a la invención, sin ninguna dificultad es posible librarse de cálculos complicados, de la necesidad de desarrollar una construcción excesivamente fuerte, de costos sustanciales y de muchos de los problemas generados que se relacionan con las superficies ásperas, los fuertes vientos y con las corrientes superficiales causadas por el viento. Las cables de acero con una longitud ajustable usada para sumergir los componentes a una profundidad entre 3-5 metros de la superficie del agua, debido a su pequeño margen de doblez, transportan en gran parte la estabilidad del piso del agua verticalmente sobre el flotador. El flotador o el pontón que continuamente produce flotabilidad para emerger verticalmente del agua adquiere una función dinámica. No ha sido difícil en absoluto producir las columnas de acero o concreto de forma redonda que transfieran la flotabilidad dinámica estable desde el flotador o pontón mencionado a la plataforma que se colocará fuera del agua. Las columnas entre las plataformas y el flotador o el pontón transportan la estabilidad del piso sobre la plataforma indirectamente por medio de los cables. La longitud de las columnas (cerca de 8 metros)

que proporcionan la conexión entre el pontón o el flotador sumergido en el agua por medio de un lastre y la plataforma sobre el agua debe ser ajustada de una manera tal que la plataforma sobre el agua deberá estar localizada lo suficientemente hacia arriba para evitar el impacto de las olas superficiales. Las ondas pueden influenciar solamente las columnas de forma redonda. Las fuerzas que actúan en las superficies totales de las columnas mencionadas disminuyen a un nivel insignificante. Consecuentemente, descubrí que podríamos obtener tanta flotabilidad por unidad de área como se deseara , aumentando o disminuyendo las capacidades de elevación de los pontones. Por lo tanto, es posible proporcionar muchas diversas estructuras en el agua aplicando las modificaciones arquitectónicas, estéticas, técnicas y mecánicas basadas en esta idea principal. En términos más simples, es posible suministrar en forma económica y práctica tierra para campos, jardines y cualquier estructura con una estabilidad tan alta como la de las tierras naturales. Las prácticas empleadas hasta el presente han sido del tipo de estructuras de flotación en el agua y las que utilizaban el sistema de estacas o pilotes, las cuales han tenido que ocuparse de difíciles cálculos y problemas ya mencionados.

Como puede observarse en la patente rusa No. RU 2200110-Cl según el arte anterior, los principios fueron tomados sobre la base de la flotación de la física y la estabilidad no se podrían proporcionar en las conexiones con la orilla costera, debido a las oscilaciones. Aquí se observaron problemas similares.

Según otro estado del arte anterior, las tecnologías de plataforma divulgadas en las patentes los E.E.U.U. 4554883 de los E.E.U.U., US6196151 Bl y la patente internacional No. WO 2005/118963 son también ejemplos de sistemas flotantes. A continuación se muestran los problemas técnicos encontrados en todas las prácticas del arte anterior:

1) Torceduras longitudinales debido a las olas,

2) Torceduras transversales debido a las olas,

3) Problemas de desplazamiento debido a las corrientes,

4) Problemas de vibraciones y desplazamientos debido a tormentas,

5) Problemas de congelación en la pista y plataformas a temperaturas bajo cero,

6) Problemas de conexión con la línea costera cuando se presentan las variaciones desnivel del agua,

7) Problemas de manufactura relacionados con la construcción de plataformas tales como pistas y mono-bloques,

8) Problemas relacionados con el mantenimiento de pistas, plataformas y flotadores o pontones ,

9) Problemas de fracturas longitudinales en caso de tormentas repentinas,

10) Problemas con la baja magnitud de la flotabilidad por unidad de metro cuadrado de pista,

11) Problemas relacionadas con el costo elevado por metro cuadrado,

12) Problemas de estabilidad y agua sobre las plataformas en caso de olas elevadas.

Para los sistemas que utilizan el sistemas de estacas o pilotes en el piso, pude determinar la presencia de numerosos problemas relacionados con mega-estructuras tales como autopistas o puentes construidos sobre pilotes colocados en el piso. En el sistema de pilotes divulgado en la patente No. CN2695482Y según el arte anterior, cuestiones tales como construcción, aspectos ambientales, costos, la formación de hielo, la sincronización y mantenimiento presentaron graves problemas. Estos problemas son los siguientes:

1) Las dificultades durante las excavaciones de tierra y la construcción de estacas o pilotes en el piso junto con los problemas ambientales
2) Altos costos
3) Problemas de formación de hielo debido al fondo abierto
4) Tiempos extensos de construcción
5) Dificultades en mantenimiento

El objeto de nuestra invención que se relaciona con las técnicas de estructuras fijas tales como cualquier clase de casa, jardín, camino, aeropuerto, aparcamiento, parque de niños y villas de recreo construidos sobre el agua en mares, lagos y ríos es eliminar totalmente los 12 problemas presentados en los sistemas flotantes y eliminarlos totalmente o en gran parte los 5 problemas presentados en los sistemas de estaca o pilote. A continuación se presentan los otros objetos de nuestra invención:

1) Permitir la construcción de plataformas fijas para estructuras sobre el agua, que no sean afectadas por las olas, tormentas y variaciones en el nivel del agua que sean fáciles de fabricar y ensamblar
2) Reducir los costos y disminuir los tiempos de construcción de estructuras sobre el agua
3) Suministrar alta estabilidad a las estructuras sobre el agua
4) Suministrar seguridad y confort para las estructuras sobre agua, equivalentes a las que se tienen en tierra firme
5) Permitir ganar tierra al mar con el mínimo daño al lecho marino, en lugar de los rellenos del mar empleados en los asentamientos a través de las líneas costeras a costos sustanciales
6) Suministrar campos sobre el agua apropiados para actividades agrícolas, a lo largo de las costas montañosas escasas de campos agrícolas
7) Permitir la construcción de carreteras fuera de la costa con conexiones fijas a las costas de ciudades localizadas en lugares en donde es difícil la construcción de carreteras
8) Permitir la construcción de aeropuertos fuera de la costa interconectados con centros poblacionales a lo largo de la costa
9) Permitir la construcción de parqueaderos a gran escala interconectados con ciudades costeras
10) Permitir la construcción dé cualquier tipo de estructuras tales como centros de la diversión, villas de recreo, parques zoológicos, parques infantiles, parques botánicos, casas de refugio de terremoto, cualquier clase de construcción con almacenes, centros deportivos, instalaciones sociales, escuelas y hospitales interconectadas con ciudades costeras
11) Permitir la construcción de autopistas de largo alcance y con varios carriles entre islas, entre islas y costas, entre los mares interiores y las líneas costeras y entre las orillas de las bahías
12) Permitir la construcción de plataformas petroleras, fábricas y plantas de energía
13) Permitir la construcción de lugares destinados a congregaciones de cultos religiosos, conciertos, villas y pueblos

14) Permitir la construcción de islas, campos de almacenamiento, campos de golf, pistas de carreras, centros comerciales sobre el agua.

Con la invención, algunos de los problemas con el arte anterior se eliminan totalmente y algunos se eliminan en gran parte. Se enumeran abajo los problemas para los cuales se ha proporcionado la solución:

1) El problema de la torcedura longitudinal se ha eliminado totalmente para las pistas, las autopistas, los aparcamientos, villas de recreación y todas las estructuras.
2) Los problemas de torceduras transversales se han eliminado totalmente.
3) Los problemas relacionados con la deriva ocasionada por las corrientes se han reducido a los límites aceptables.
4) Los problemas de vibraciones debido a tormentas se han eliminado totalmente, y los problemas de la deriva debido a las tormentas se han reducido a los límites aceptables.
5) El problema de la congelación en las pistas, las autopistas y los puentes en temperaturas bajo cero se ha eliminado totalmente.
6) Los problemas relacionados con las subidas y las caídas en el nivel del mar (marea alta y marea de baja) se han eliminado totalmente.
7) Los problemas de manufactura en la construcción de plataformas tipo mono-bloque han sido completamente eliminados.
8) Los problemas de mantenimiento de las autopistas, flotador portante o pontones han sido completamente eliminados.
9) El riesgo de fractura longitudinal en la autopista durante tormentas repentinas ha sido completamente eliminado.
10) El problema con la baja magnitud de flotabilidad en la autopista por unidad de metro cuadrado ha sido completamente eliminado.
11) El costo por unidad de metro cuadrado ha sido reducido aproximadamente a la mitad.
12) Los problemas de la estabilidad se han eliminado totalmente, los problemas relacionados con el agua que fluye sobre la plataforma se han eliminado en gran parte y las estructuras en el agua han proporcionado la comodidad, seguridad y estabilidad equivalentes a las que se logran en el continente.

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La lógica básica de nuestra invención es librarse de los problemas encontrados con el arte anterior sumergiendo por la fuerza los flotadores y los pontones mas ligeros que el agua a una profundidad entre los 3-5 metros de la superficie del agua, con objeto de librarse completamente de las complicadas fuerzas de las olas, para eliminar totalmente el impacto de los fuertes vientos y para evitar en gran parte la influencia de las corrientes superficiales. Los flotadores y los pontones se sumergidos a la fuerza por medio de un peso mayor que la flotabilidad no disminuye su flotabilidad. Los problemas mencionados son eliminados moviéndolos a un nivel del agua donde su flotabilidad sigue siendo igual, pero se protegen contra los efectos de las olas superficiales, de las corrientes superficiales y de los fuertes vientos. Por lo tanto se ha logrado la manera de librarse sin ninguna dificultad, de cálculos complicados, de la necesidad para construir una construcción excesivamente fuerte, de costos elevados y muchos de los problemas causados por las superficie áspera, fuertes vientos y vientos causados por las corrientes superficiales. Los cables de acero de longitud ajustable usados para sumergir los componentes a una profundidad de 3 a 5 metros de la superficie del agua, debido a su pequeño margen de flexión o curbamiento, transmiten en gran parte la estabilidad del piso del agua verticalmente hacia el flotador. El flotador o pontón que produce continuamente flotabilidad para salir verticalmente del agua adquiere una función dinámica. Es relativamente fácil producir columnas de acero o concreto de forma redonda para llevar la flotabilidad dinámica estable del mencionado flotador o pontón sobre la plataforma que se colocará fuera del agua. Las columnas entre las plataformas y el flotador o pontón transfieren la estabilidad del piso sobre la plataforma indirectamente, por medio de las cuerdas. La longitud de las columnas que proporcionan la conexión entre el pontón o flotador sumergido en agua por medio de peso y la plataforma en el agua debe ser ajustada de una tal manera que la plataforma en el agua se encuentre localizada lo suficientemente hacia arriba para evitar el impacto de las olas superficiales. Las ondas pueden influenciar solamente las columnas con una forma redonda. Las fuerzas que actúan en las superficies totales de las mencionadas columnas son insignificantemente pequeñas. Consecuentemente, se ha descubierto que se podría obtener tanta flotabilidad como se desee por unidad de área, aumentando o disminuyendo las capacidades de elevación de los pontones. Es entonces posible

proporcionar muchas estructuras diferentes en el agua aplicando modificaciones arquitectónicas, estéticas, técnicas y mecánicas basadas en esta idea principal. En términos más simples, ha llegado a ser posible suministrar tierra artificial económica y práctica para los campos, jardines y cualquier tipo de estructura con una estabilidad tan alta como la que se logra en las tierras naturales.

Hasta el presente, los investigadores han manejado las estructuras bien sea mediante estacas o pilotes o bien mediante el sistema de flotación en el agua. Nuestra invención se relaciona con una tecnología sumergida parcialmente por medio de pesos, que por lo tanto ni se sumerge ni se pone en las estacas. La lógica de la invención se basa en un principio extremadamente simple. Las técnicas para obtener grandes niveles de flotabilidad se saben y se aplican, usando flotadores huecos (mas ligeros que el agua) hechos de acero, poliéster, pantalla de concreto reforzado, etc, o mediante pontones llenados de espuma. Todas estas técnicas se basan en las leyes de la flotación. Consecuentemente, a menos que se perforen y permita que el agua penetre y por lo tanto lleguen a ser más densos que el agua, no se sumergirán. Con el invento actual, los pontones y flotadores se sumergen y fijan a cierta profundidad en el agua por medio del mecanismo de cables de acero con longitud ajustable, usando pesos cercanos a dos veces la flotabilidad, para evitar que sean afectados por las olas a nivel del agua y los aumentos y disminuciones en el nivel del agua. Por lo tanto, los mencionados flotadores o pontones que tienen la fuerza adecuada para la presión de agua logran una estabilidad mecánica vertical cercana a la estabilidad de tierra dinámica, por lo que intentan siempre emerger del agua, pero no pueden ir ni hacia abajo ni hacia arriba mientras que se encuentren fijas al peso en el piso.

La plataforma de estructura fija para alcanzar el objeto de la invención se ilustra en los dibujos incluidos, en los cuales:

La figura - 1 muestra la vista general de la lógica de flotación e inmersión de bolas para la formación de la plataforma fija.

La figura - 2 muestra la vista general de la lógica de flotación e inmersión de cubos para la formación de la plataforma fija.

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La figura - 3 muestra la vista general de la lógica de flotación e inmersión del flotador de acero de forma de cristal con un lado inferior abierto para la formación de la plataforma fija.

La figura - 4 muestra la vista general de la lógica de flotación e inmersión del flotador de concreto con un lado inferior abierto para la formación de la plataforma.

La figura - 5 es la vista del cubo sumergido en un recipiente de cristal por medio de un peso.

La figura - 6 es el corte de un flotador de concreto con una abertura en el fondo.

La figura - 7 es la vista del balance de un flotador de concreto de fondo abierto por medio de 4 pesas.

La figura - 8 es la vista del balance de un flotador de concreto de fondo abierto por medio de 4 pesas, balanceadas mediante conexiones en cruz.

La figura - 9 es la vista frontal de una sección de un flotador de acero de fondo abierto.

La figura - 10 es la vista superior de una sección de un flotador de acero de fondo abierto.

La figura - 11 es la vista en perspectiva tri-dimensional de un flotador de acero de fondo abierto.

La figura - 12 es la vista inferior en perspectiva de una sección de un flotador de acero de fondo abierto.

La figura - 13 es la vista detallada del punto de conexión de los cables de un flotador de acero de fondo abierto.

La figura - 14 es la vista detallada de la conexión de un flotador de acero de fondo abierto con la plataforma en concreto.

La figura - 15 es la vista detallada del interior de un flotador de acero de fondo abierto.

La figura - 16 es la vista de una sección frontal de flotadores de acero de fondo abierto.

La figura - 17 es la vista de una sección lateral de flotadores de concreto de fondo abierto.

La figura - 18 es el detalle de columnas sobre el agua, dispuestas sobre flotadores de concreto de fondo abierto.

La figura - 19 es la vista de la perspectiva del ensamble de flotadores de concreto de fondo abierto.

La figura - 20 es la vista en perspectiva de una parte de la plataforma sobre el agua.

La figura - 21 es la vista en perspectiva de la formación de flotadores de concreto de fondo abierto y la plataforma.

La figura - 22 es la vista detallada de la conexión inferior de flotadores de concreto de fondo abierto.

La figura - 23 es la vista de un ensamble de flotadores de concreto de fondo abierto, formando una plataforma.

La figura - 24 es la vista detallada de columnas de los flotadores de concreto de fondo abierto.

La figura - 25 es la vista seccional y vista del nivel de agua de los flotadores de concreto de fondo abierto.

La figura - 26 es una vista tridimensional de la formación de una pista

La figura - 27 es una vista detallada de los pesos de concreto sumergiendo los flotadores.

La figura - 28 es la vista seccional de la plataforma flotante de fondo abierto y la vista de los cables con conexiones en cruz.

La figura - 29 es la vista frontal de una sección de plataforma flotante con fondo abierto y la vista de los cables con conexiones en cruz.

La figura - 30 es la vista detallada de la conexión de cables en cruz

La figura – 31 es la vista seccional de una plataforma en donde el invento es utilizado en una superficie de piso disparejo.

La figura - 32 es la vista en perspectiva de un ensamble de flotadores de acero de fondo abierto con la plataforma.

La figura - 33 es la vista del nivel de agua de plataforma flotante en acero con fondo abierto.

La figura - 34 es la vista en perspectiva del ensamble de una pista completada con flotadores de acero de fondo abierto.

La figura – 35 es la vista detallada de un peso de concreto sumergiendo los flotadores de acero de fondo abierto.

Con el fin de hacer más fácilmente comprensible la lógica detrás de nuestra invención que se relaciona con las técnicas de estructuras fijas tales como cualquier clase de casa, jardín, camino, aeropuerto, aparcamiento, parque de niños villas de recreo sobre el agua en los mares, lagos y ríos, coloquemos una bola plástica (1) que tiene el tamaño de un balón de fútbol (1) y llenado de aire (12) dentro de una red (2). Asumamos que atamos una cuerda (o cable) con la suficiente longitud para manejar la red (2), la conectamos con un peso o lastre (4) para sumergir la bola (1) en el agua (10), y así sumergimos la bola (1). Cuando la bola (1) intente salir verticalmente del agua (10), esta será ajustada a la cuerda (3) atada a la red (2) por una fuerza correspondiente a la flotabilidad. Podemos ajustar cuanto la bola (1) deberá sumergirse bajo el nivel del agua, por medio de la longitud de la cuerda (3). En este simple experimento, la estabilidad estática del peso (4) sumergido en el piso será transmitida a la bola (1) por medio de una cuerda no flexible (3) y la red (2). La bola (1) deberá estar situada lo suficientemente debajo de la superficie del agua (5) de tal forma que no se verá afectada por las olas (11) y en consecuencia, las olas pasarán fácilmente sobre ella. Ampliemos el alcance de la idea. Asumamos que tomamos 32 piezas de bolas de plástico (1) con un diámetro de 25 cm y las llenamos de aire (12). Las colocamos una a una en 32 redes (2) y las sumergimos en una piscina (4) de 2 metros mediante pesos o lastres (4). Ajustamos la longitud de las cuerdas (3) de tal forma que todas las bolas (1) se sumergirán a una profundidad de 30 cm de la superficie del agua (5). Disponemos las pesas (4) sumergiendo las bolas (1) en el fondo de la piscina (9) de tal forma que las bolas (1) que intenten salir del agua serán posicionadas mediante un patrón de 4 filas de bolas de ancho y 8 filas de bolas de largo. Puesto que las bolas (1) estiran las cuerdas (3) en una dirección vertical debido a su flotabilidad, la alineación de los pesos (4) será observada igualmente en las bolas (1). Como resultado, la alineación obtenida de las bolas (1) será de aproximadamente 30 cm desde la superficie del agua (10) con una forma que se asemeja a una mesa (8) con un borde de cerca de 1 m y el otro de cerca de 2 m.

Coloquemos sobre las bolas (1) una mesa plástica (8) con las mismas dimensiones de ancho y largo, de aproximadamente 1m y 2m, respectivamente; suficientemente dimensionada para cubrir todas las bolas (1) de forma invertida de modo que sus patas (6) se extiendan hacia arriba del agua (10). Colocamos un tablero de 1m de ancho por 2 m de largo que opera como una plataforma (7) sobre las cuatro patas (6) de la mesa (10) extendiéndose fuera del agua (10). Asombrosamente se observará que la estabilidad y fuerza del piso de la piscina (9) se transmite exactamente a la plataforma del tablero (7), aun cuando varios niños se suban sobre la plataforma mencionada (7). Mediante un cálculo aproximado, 32 bolas (1) de 25 cm de diámetro y una flotabilidad de cerca de 4 kg, producirá una flotabilidad total de 128 kg. Otro hecho importante de éste experimento es observar que las olas (11) de la piscina (9) afectan únicamente las 4 patas (6) de la mesa plástica (8) que se extiende 30 cm bajo el agua (10) hacia fuera del agua. Si la pata de la mesa (6) es de aproximadamente 60 cm de longitud, significa que la plataforma del tablero (7) sobre el agua (10) es de aproximadamente 30 cm sobre el nivel del agua (10). Como resultado, aun en condiciones en donde la amplitud de la ola es de 50 cm de pico a pico, el impacto en la mesa (8) y en el tablero plataforma (7) será mínimo en éste sistema en miniatura. Las olas en la piscina no implicarán daño alguno a no ser que su altura sea lo suficientemente grande para impactar la mesa (8) 30 cm. bajo el agua (10) y la plataforma del tablero (7) 30 cm. sobre el agua.

No es difícil observar que en la práctica los componentes pueden hacer frente a las ondas gigantes (11) incluso cuando incrementamos las características de este ejemplo miniatura 10 veces según la escala. También, es natural que por ejemplo una disminución o un incremento de 15 cm. del nivel de agua (10) de la piscina no influenciará el sistema. Sin embargo, las corrientes horizontales en el agua (10) y los fuertes vientos afectarán parcialmente a este sistema. Cuando el sistema se fabrica de tipo mono-bloque y es de tamaño substancial, las oscilaciones se aquietarán debido a la disminución de la frecuencia de la resonancia. Para reducir al mínimo las mencionadas oscilaciones, se utilizan las conexiones cruzadas (26) de las cuerdas (3) con los lastres o pesos (4) en el piso proporcionado así una mejora sustancial. Ahora bien, refiriéndonos a la Figura-2, invirtamos la disposición ordinaria (16) del cubo (15) de tal manera que se evite el escape del aire (12) dentro de él, atando la cuerda (3) a su manija (16), y

sumergiéndolo igualmente a una profundidad de 30 cm. del nivel del agua de la piscina (9) por medio del peso o lastre (4). Se observará que el cubo (15) intentará salir del agua (10) tensionando la cuerda (3). El peso o lastre (4) debe ser mayor que la flotabilidad del cubo (15).

Este simple sistema balanceado o equilibrado reflejan el principio de flotadores (23) y flotadores de acero (23) llenos de aire (12) de acuerdo con el invento. Coloquemos una mesa invertida (8) sobre un número apropiado de cubos invertidos sumergidos (15) como se muestra en la figura-2. De igual manera, coloquemos una plataforma tipo tablero (7) de una dimensión adecuada sobre las patas de la mesa (8) extendiéndose fuera del agua. De ésta forma, obtendremos un sistema que no es afectado por las olas (11) y por las variaciones del nivel de agua (10). Este experimento arroja las mismas condiciones y resultados cuando utilizamos flotadores de acero huecos con forma de cristal (22) (Ver figura -3). Se observará que éste sistema será influenciado por las olas (11) en la superficie del agua (5) en una forma insignificante. Refiriéndonos a la Figura 4, el flotador de concreto (23) con lado inferior abierto se utiliza para proporcionar la misma función, cuando es utilizado en lugar del pontón concreto cerrado en todos los lados y llenado de espuma. En los cálculos de flotabilidad, debe considerarse que el agua (10) llenará el boquete del aire comprimido por la presión de agua reduciendo levemente su volumen. Hay cuatro diferentes ejemplos de los sistemas flotantes. La plataforma con bolas (17), la plataforma con cubos (18), la plataforma con flotadores de acero con el lado inferior abierto (19) y la plataforma de concreto llenada de aire con el lado inferior abierto (25) se muestran respectivamente en la Figura-1, Figura-2, Figura-3 y Figura-4. Como se evidencia en las figuras, los sistemas flotantes son abiertos y desprotegidos contra cualquier efecto de las olas, corrientes, tormentas y variaciones del nivel del agua. Estos sistemas pueden ser parcialmente protegidos contra algunos de los impactos mencionados conectándolos a la costa o al suelo mediante cuerdas o cables.

En la Figura-5, se coloca un soporte (28) sobre el cubo invertido (15) que se encuentra sumergido en el agua (10) por medio del peso o lastre (4) dentro de un recipiente de cristal (29) lleno de agua. Las cartas de juego (27) se disponen simbólicamente en el soporte (28) de una manera tal que sean muy fáciles de

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derrumbarse. Se observó que estas cartas (27) no se derrumbaron incluso cuando el agua (10) generaba olas.

En la Figura-6, se observa la vista seccional tridimensional del flotador de concreto (23) con el lado inferior abierto llenó el aire (12). Se puede producir muchos flotadores de éste tipo mediante moldes thp. De esta manera, se obtienen flotabilidades muy altas. En la Figura-7, vemos el método para asentar en el piso por medio de cuatro pesas o lastres (4) y de cuatro cuerdas o cables (3), mientras que la Figura-8 muestra el método de fijación usando conexiones cruzadas (26). En la Figura-9, se observan las columnas de tubería (21) para ser reforzadas por 8 platinas (30) para la conexión al flotador (22), en la vista seccional del flotador de acero hueco (22) con el lado inferior abierto. Las mencionadas platinas (30) se fijan al flotador (22) por razones hidrodinámicas, con el objeto de reducir la superficie total del flotador (22). En la vista superior de la sección del flotador de acero (22) con el lado inferior abierto mostrada en la Figura-10, se observan 4 piezas de tipo trinquete de conexión al flotador (35) en ángulo de 90 grados por cada uno, 8 piezas de varilla (38) y 8 piezas de platina. En la Figura-11, las laminas de hierro (48) con un espesor seccionado transversalmente desde la parte inferior son utilizadas en la fabricación del flotador de acero con el fondo abierto (22). La razón para esto es que la presión del aire confinado en el flotador (22) de fondo abierto es constante en cada punto de las superficies interiores. Como resultado, la presión del agua externa se reduce en dirección hacia arriba a través de la columna (21), mientras que la presión de aire es igual a la presión en el fondo del nivel de agua del flotador (22); a ello se debe el aumento interno de las fuerzas extensibles. El espesor de la cubierta cónica (36) debe ser elaborado de modo que pueda soportar las fuerzas de presión y transferir la flotabilidad del flotador a la plataforma (7) por medio de una columna (21) centrando la flotabilidad del flotador.

La columna (21) centrada y reforzada mediante 8 laminas (30) en el interior debe elaborarse a partir de un tubo preferiblemente sin soldadura con un diámetro adecuado y con un amplio espesor. Dentro de esta columna (21), la cuerda o cable (3) y la tubería (33) con el diámetro adecuado para transportar el agua (10) y el aire (12) extendiéndose hasta las secciones más bajas del paso de la columna. La mencionada tubería (33) abierta al paso de agua en el extremo inferior y conectada con la toma de ajuste de la longitud

de la cuerda (34) cerca de la plataforma (7) en el extremo superior compensa la cantidad reducida de aire en el flotador (22) por medio de aire presurizado, cuando sea necesario. Debe ser de un diámetro interno lo suficientemente grande que no obstaculice el ajuste de la longitud de la cuerda (3) cuando esté sea requerido. Por otra parte, el agua caliente del piso aspirada a través de la tubería (33) debe ser de tal cantidad que permita la circulación hacia el sistema de serpentines de la plataforma (7) por medio de los motores de circulación. De esta manera, se previene la generación de hielo en la superficie de la plataforma que está abierta en las partes inferior y superior a las condiciones atmosféricas.

La Figura-12 muestra el posicionamiento de los trinquetes de conexión (35) y el dispositivo de manejo de conexión de las cuerdas o cables con el flotador de acero de fondo abierto, mientras que la figura 13 muestra sus detalles. En la vista detallada de la Figura-14 pueden verse la brida (20) que conecta la columna (21) con la plataforma (7) y 4 huecos de pernos (37) que permiten asegurar la brida mencionada por medio de pernos a la plataforma. 8 aletas de refuerzo (30) están soldadas al punto donde la columna se conecta con la platina de la brida (20). La Figura-15 que muestra una sección parcial tridimensional del flotador de acero de fondo abierto (22), puede verse la forma como la tubería guía de acero (33) en el centro del flotador (22) se encuentra centrada en las regiones cercanas al fondo por medio de 8 varillas de centramiento (38). Los mencionados centramientos, centran la fuerza de suspensión al piso por medio del cable (3) y son importantes para el balance vertical del flotador (22).

En la Figura-16, se muestran 6 piezas del flotador de concreto de fondo abierto (23) en una sección cruzada formando una unidad, donde también se puede observar que el número de celdas del flotador (23) puede ser incrementado y alargado hasta el punto permitido por el tamaño de los grandes moldes. Como puede evidenciarse observando la vista lateral de la Figura-17, es posible construir largas autopistas colocando las celdas juntas una a otra. La Figura-18 muestra el detalle de la cuerda de la tubería (33) con los detalles de la toma de ajuste de longitud (34), que también permite la descarga de aire y agua, donde también pueden observarse las varillas de hierro de la columna (21) con una sección semicircular en un molde combinado con un flotador de concreto de bordes redondeados.

En la Figura-19 las fases de una producción de flotadores de concreto de fondo abierto (23) a partir de la formación de una celda hasta la formación de columnas y plataformas mostradas en la Figura-21. Pueden verse los detalles de la tubería en serpentín (47) dentro de la plataforma (7) y el flotador de concreto en mono-bloque (23) conformado por 10 celdas. En la Figura-20, puede verse que el espesor en la sección transversal de la plataforma (7), cuya parte inferior se muestra, se incrementa a partir del centro de la columna siendo más débil en la mitad de dos columnas (21). En la Figura-22 una tubería pasa por el interior de la columna (21) con una sección transversal semicircular, cuya tubería se conecta con el flotador (23) por medio de la columna (21) que comienza bajo la plataforma de concreto (7), pasa a través de la pared lateral del flotador (23) y se extiende hasta las manijas de concreto (43) que conectan los flotadores (23) con los pesos o lastres (4). El extremo superior de esta tubería comienza inmediatamente debajo los hierros de la columna (42) y se extiende hasta las manijas de concreto (43) que conectan los pesos o lastres (4). La mencionada tubería (33) tiene 3 funciones, a saber, compensar la cantidad de aire perdido del flotador, aspirar el agua del fondo del serpentín (47) y funcionar como toma de ajuste de la longitud del cable (34).

La figura – 23 muestra como los bloques flotadores de concreto formando una conjuntos monobloque de 10 celdas son colocados uno al lado del otro y son conectados por medio de la utilización de abrazaderas con las columnas (21) y como la plataforma de monobloque (7) puede ser fácilmente vaciada en el agua utilizando moldes de madera como los utilizados en construcción. La Figura 24 muestra en detalle como dos columnas (21) con una sección transversal semicircular de dos flotadores de concreto (23) colocados lado a lado son convertidas a una columna (21) cilíndrica (45). Haciendo referencia a vista de la sección horizontal de la figura-25, es posible entender a que profundidad del nivel del agua (5) serán sumergidos los flotadores de concreto de fondo abierto (25) localizados lado a lado. Cuando sumergimos los flotadores (23) de modo que se hundan exactamente hasta la mitad de las columnas (21), la extensión que será influenciada por las olas será minimizada. En la Figura-26, es formada una sección tridimensional de una pista de aviones, conectando los pesos o lastres (4) con las unidades de flotación (23) por medio de cables, conectando las unidades de flotación una con otra por medio de abrazaderas con las columnas (21), ajustando la longitud del

cable (3), alineando todas las unidades de flotación al mismo nivel, y vaciando la plataforma en concreto mono-bloque (7) sobre los hierros de las columnas (42) por medio de moldes. En la Figura 27, las manijas de conexión de los pesos o lastres (41) muestran en forma detallada las conexiones de los cables (3) con los pesos o lastres (4). La figura-28 ilustra la vista seccional de la pista completada y el nivel del agua (5). Como se habrá entendido en esta sección, los flotadores de concreto (23) son sumergidos y asegurados en el agua (10) hasta la mitad de la longitud de las columnas (21) por medio de los cables (3) conectados con los pesos o lastres (4) localizados en el suelo del fondo del agua. Aquí se aprecia la aplicación en donde las oscilaciones son minimizadas en cada dirección empleando ocasionalmente cables (26) conectados en forma cruzada longitudinal y transversalmente.

La figura 29 es una ilustración transversal de la conexión cruzada de los cables (3), el peso (4), el flotador de concreto (23), la columna (21) y la plataforma (7) en sección transversal, lo mismo que el nivel del agua. La Figura-30 incluye la vista detallada que muestra la necesidad de asegurar una con otra las conexiones cruzadas de los cables (26). La Figura 31 es la vista de una sección transversal que muestra como la longitud de los cables (3) podrá ser regulada en los casos en que el suelo en el fondo del agua presente rugosidades y no sea uniforme y la formación de la pista con flotadores de concreto (23) posicionados de una manera exacta. Como Se observa en las figuras, los flotadores (23) se encuentran siempre ajustados de modo que se encuentren sumergidos en el agua (20) la mitad, incluyendo los flotadores de acero (22). Las distancias ente los picos de las olas a la plataforma (7) y la superficie del flotador de concreto (23) debe ser igual.

En la figura 32, una celda de 18 flotadores de acero de fondo abierto independientes (22) son convertidas en un monobloque uniéndolas lado a lado sus trinquetes uniéndolos mediante abrazaderas. Para colocar la plataforma en monobloque sobre las columnas que se extienden desde los ejes centrales de los flotadores de acero de fondo abierto, se utilizan piezas (20) que conectan las columnas con las plataformas. Dichas conexiones se efectúan atravesando pernos a través de los huecos de perno (37).

Haciendo referencia a la vista seccional horizontal en la Figura-33, es posible entender a que profundidad del nivel (5) del agua (10) deberá ser sumergido el

monobloque de flotadores de acero con el fondo abierto (22). Cuando sumergimos los flotadores de acero (22) de modo que se hundan hasta exactamente la mitad de las columnas (21), el grado de influencia de las olas será minimizado.

En la figura - 34, una sección tridimensional de una pista de aviones es formada conectando pesos o lastres (4) con las unidades de flotación (22) por medio de cables (3) fijados mediante abrazaderas, uniendo las unidades de flotación por medio de trinquetes (35) para formar el flotador de acero (22) en forma de monobloque, ajustando las longitudes de los cables (3), alineando todas las unidades de flotación (22) al mismo nivel y completando el vaciado de la plataforma de concreto en monobloque (7) sobre las piezas de conexión de las columnas (20) por medio de moldes.

En la vista detallada de la conexión de los pesos o lastres (4) y los cables (3) mostrada en la figura 35, pueden observarse las manijas de conexión de los pesos o lastres (41).

La presente invención puede ser utilizada para la construcción de carreteras, puentes, parqueaderos de autos, aeropuertos, casas, centros de diversión, centros de negocios, instalaciones sociales, complejos deportivos, centros para conciertos, casas sismorresistentes, campos de agricultura y carreteras de conexión entre islas, entre islas y zonas costeras, y en todas las estructuras fijas sobre plataformas, tendientes a la formación de plataformas adecuadas cuando se requieran estructuras fijas sobre el agua que posean una alta estabilidad aun en aguas profundas.

REIVINDICACIONES

1- El invento relacionado con una plataforma fija que permite localizar una estructura fija sobre el agua, tal como una casa, jardín, camino, aeropuerto, parqueadero de autos, parque infantil, villas de recreación en mares, lagos y ríos. Abarca la plataforma (7) sobre los flotadores (22) capaces de flotar a una zona segura sumergida entre 3 y 5 metros de la superficie del agua (10), los flotadores (22) que consumen energía al tratar de salir a la superficie del agua (5) producen las fuerzas que tratan de mantener la plataforma (7) siempre en el mismo punto, debido a la tensión de las cuerdas o cables (3) sobre el flotador (22) es posible prevenir que la mencionada plataforma (7) se desplace a causa de tormentas violentas, grandes olas y corrientes marinas, en donde la plataforma (7) que es manufacturada de una forma apropiada para su propósito abarca los pesos o lastres (4) que son conectados mediante cuerdas o cables (3) utilizados para mantener los flotadores (22) a una distancia constante del piso en un estado sumergido, los flotadores (22) producen la flotabilidad que soporta la plataforma (7), las columnas portantes (21) conectan los flotadores (22) con la plataforma (7) y las piezas conectoras (20) unen las columnas (21) con la plataforma (7).

2- La plataforma fija de acuerdo con la reivindicación 1 caracterizada por ser preferiblemente elaborada de concreto, y abarca los pesos o lastres formados por bloques de concreto reforzado mediante una jaula de acero en su interior, resistentes al agua de mar que han sido firmemente dispuestos en el suelo y las manijas (41) a través de las cuales los cables de acero (3) pueden ser conectados con la parte superior.

3- La plataforma fija de acuerdo con la reivindicación 1 abarca los cables de conexión (3) que son recubiertos, preferiblemente mediante el proceso de galvanización, para evitar la oxidación y corrosión, poseen una alta tolerancia y un margen de doblez o curvatura tan bajo como sea posible. Uno de sus extremos se encuentra conectado y asegurado mediante abrazaderas a la manija (41) localizada en el peso o lastre y el otro ingresa a través de una tubería (33) localizada en el eje central del flotador (22) hasta salir en un punto cercano a la parte inferior de la plataforma (J). La longitud del cable puede ser ajustada como se desee y es fijada y asegurada mediante abrazaderas.

4- La plataforma fija de acuerdo con la reivindicación 1 y la reivindicación 3 abarca la conexión plana que por medio de los pesos o lastres (4) transfieren la flotabilidad vertical que debe ir desde la tubería (33) en el eje central a la parte inferior de la plataforma (7) para que por medio del cable (3) conectado con el peso (4) pueda ser ajustado desde arriba y la conexión cruzada (26) que minimiza las oscilaciones a través de la dirección horizontal.

5- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque comprende los flotadores (22), preferiblemente galvanizados o pintados, los cuales son fabricados de acero, tienen el fondo abierto con aire (12) atrapado en su interior, poseen aletas (30) que refuerzan la columna, la tubería (33) que guía el cable (3) conectado con el peso o lastre (4), la columna hueca (21) conectada con las aletas (30), las varillas centradoras (38) cerca de la sección del fondo abierto, la manija de conexión cruzada de los cables (40), los trinquetes (35) que conectan los flotadores uno a otro, la brida (20) para la conexión con la plataforma (7) y la toma de ajuste de la longitud del cable (34) bajo la brida de conexión, los cuales son cónicos en la parte de arriba y abiertos en el fondo, tienen un espesor de la lamina decreciente de arriba hacia abajo, son resistentes a la corrosión y la oxidación y poseen una estructura modular que los permite unir unos con otros cuando son colocados lado a lado.

6- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque comprende la unidades de flotación (22) fabricadas preferiblemente de concreto reforzado, las cuales poseen una estructura celular que divide el aire atrapado en su interior, las columnas fijadas a los bloques de concreto mediante hierros (42) colocados allí para permitir su vaciado con la plataforma de concreto (7) y las manijas (43) con proyecciones en concreto en la parte inferior para permitir la conexión con los pesos o lastres (4), posee una unidad mono-bloque con paredes en concreto tipo pantalla (44) con un espesor que se mantiene tan delgado como sea posible y posee una estructura modular que permite unirlas unas a otras.

7- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque comprende las columnas (21) en el flotador de concreto (23), cuyas columnas (21) poseen la

suficiente fuerza para transferir la flotabilidad de los flotadores (23) en dirección vertical hacia la plataforma (7) y poseen la suficiente fuerza mecánica para permitir sumergir los flotadores (23) a una profundidad segura bajo el nivel del agua, y elevan la plataforma (7) sobre el nivel de seguridad poseen baja oscilación y alta capacidad de soporte, son fabricadas preferiblemente de una sola pieza, incluye el tubo de acero (33) por donde pasan el cable de conexión (3) y el aire, comprende una pieza sencilla con el flotador de concreto (23), tiene en su interior una sección transversal semicircular y forma un cilindro (45) que cuando se coloca lado a lado con otros, como los flotadores (23) son modulares.

8- La plataforma fija de acuerdo con la reivindicación 1 y la reivindicación 7 caracterizada porque comprende un tubo de acero (33) a través del cual se extienden el cable de conexión y el aire desde el punto de su conexión con el flotador (23) hasta la proyección de conexión (43) en el fondo del flotador (23).

9- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque tiene la plataforma (7) con una estructura con una forma ligeramente parecida a un domo (46) entre las columnas (21), en donde las secciones donde la plataforma (7) se conecta con los hierros (42) son gruesas y las secciones cruzadas se tornan mas delgadas con el incremento de la distancia de las columnas (21).

10- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque posee una estructura modular de tal forma que es posible desmontar los flotadores de concreto dañados (23) y los flotadores de acero (23) desde el fondo del agua y colocar los nuevos flotadores en lugar de los dañados.

11- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque posee un intercambiador de calor tipo serpentín (47) que previenen la formación de hielo, por donde pasará el agua templada que previene del fondo del mar a través del cable de acero (3) y la tubería de aire (33), colocada en intervalos adecuados mientras se efectúa el vaciado del concreto de la plataforma (7).

12- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque el flotador (22-23) comprende el sistema de llenado de aire para las celdas de aire, que fuerza el aire presurizado desde la tubería dentro de la columna (21) cuando el aire atrapado en el flotador (22-23) disminuye, con el fin de incrementar la mencionada cantidad al nivel deseado.

13- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque la fijación de los columnas de tubería (21) al flotador (22) se lleva a cabo mediante el refuerzo de su interior por medio de platinas (30) con el fin de reducir la superficie exterior total del flotador.

14- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque las láminas de acero (48) utilizadas para la manufactura del flotador de acero abierto poseen un corte transversal que se incrementa a partir del fondo.

15- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque las láminas de acero (48) utilizadas para la manufactura del flotador de acero abierto poseen un corte transversal que se incrementa a partir del fondo.

16- La plataforma fija de acuerdo con la reivindicación 1 caracterizada porque la columna (21) centrada y reforzada desde el interior por medio de laminas (30) es hecha preferiblemente de una sola pieza de tubería sin soldadura, con un espesor de la pared grande y un diámetro adecuado.

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23.12.2005

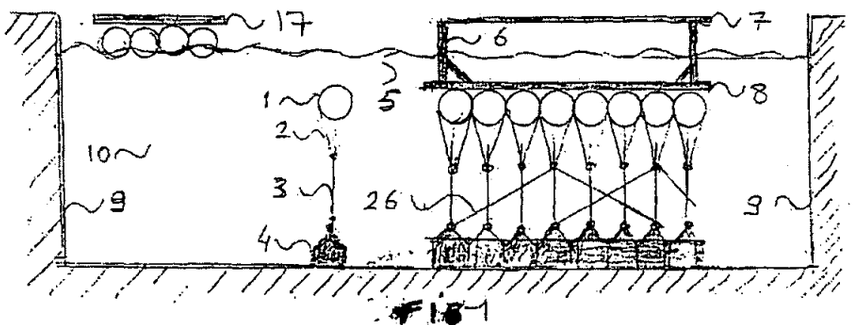


FIG-1

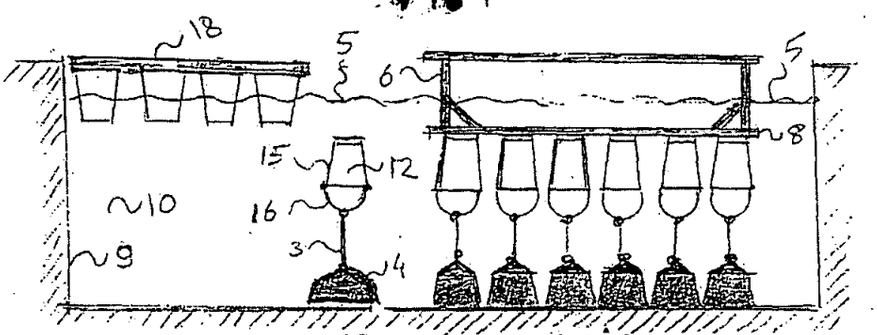


FIG-2

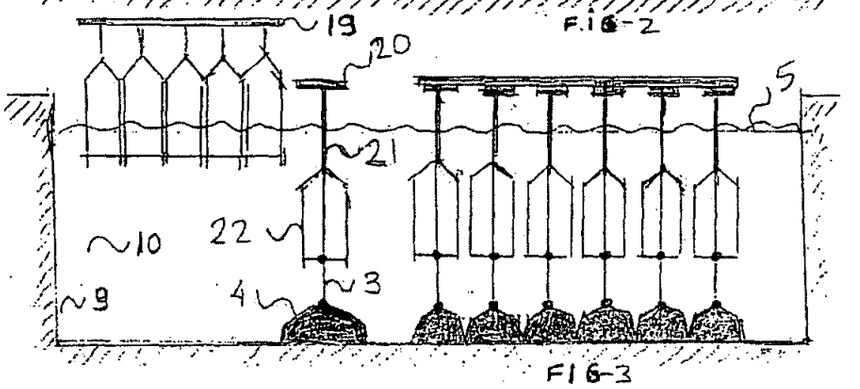


FIG-3

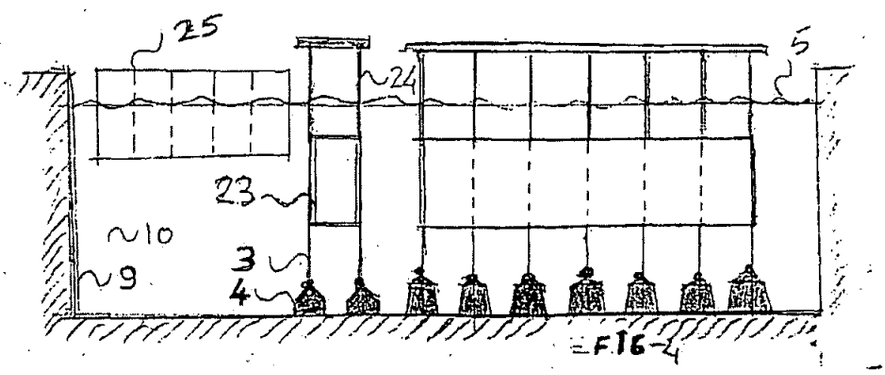


FIG-4

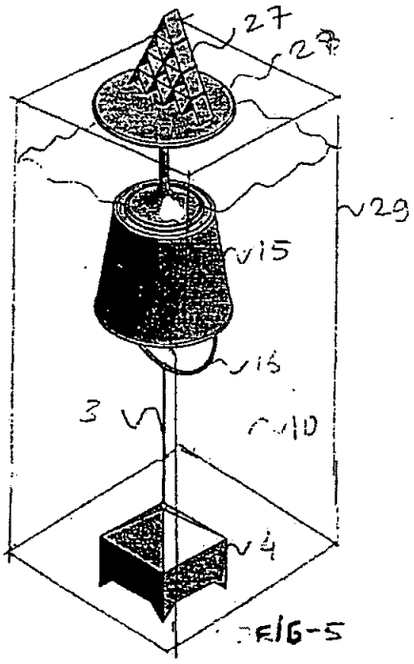


FIG-5

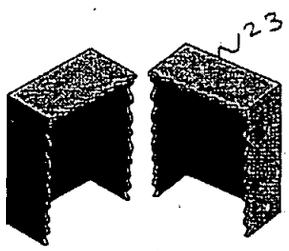


FIG-6

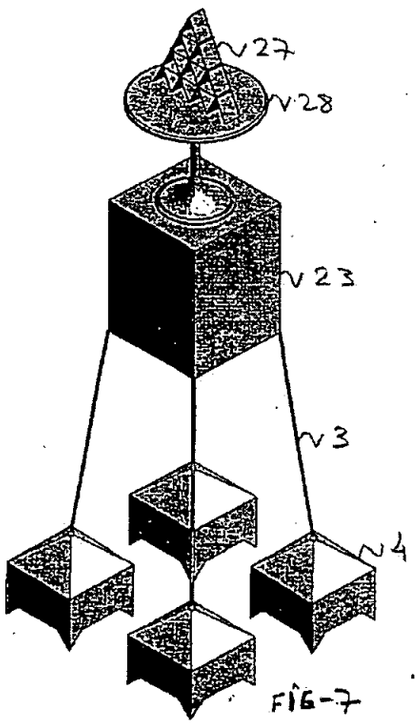


FIG-7

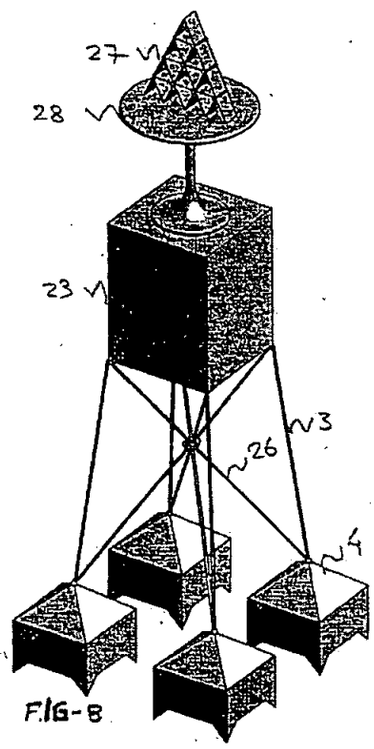


FIG-8

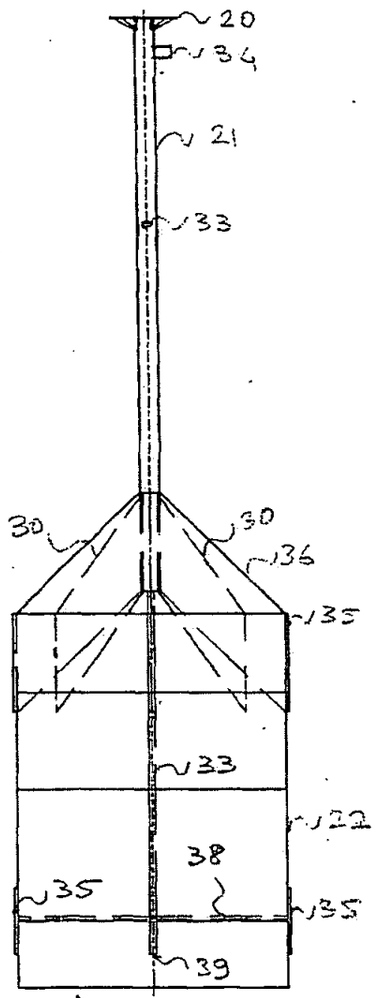


FIG-9

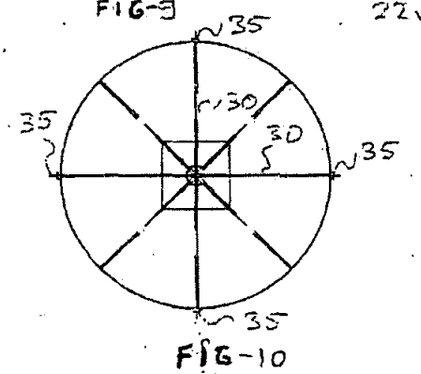


FIG-10

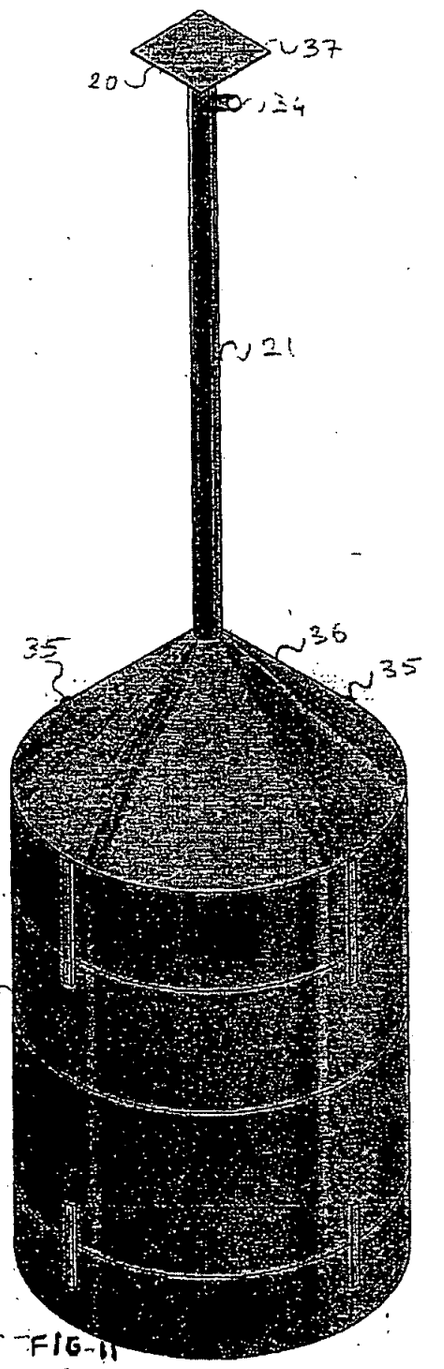


FIG-11

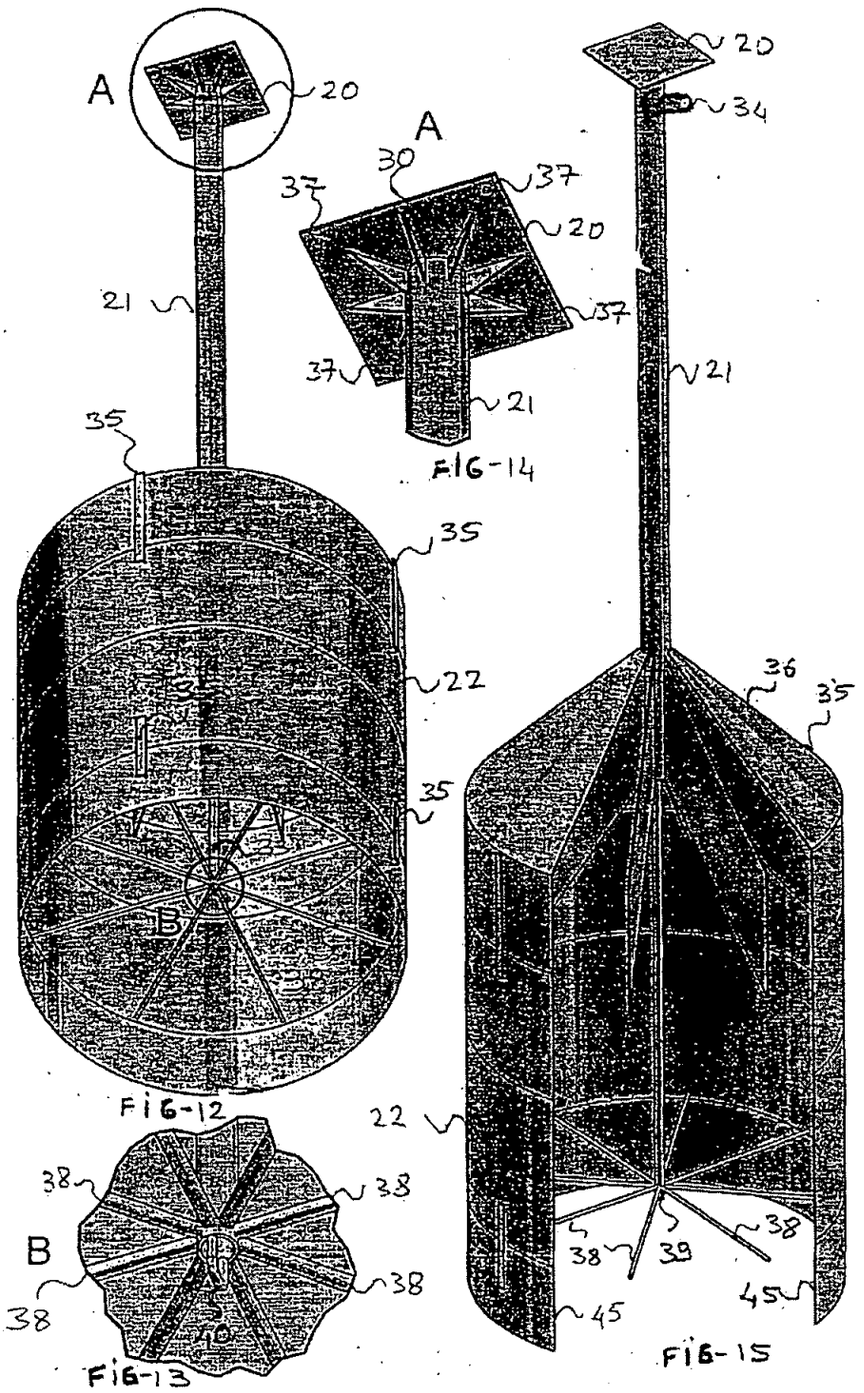


FIG-12

FIG-13

FIG-14

FIG-15

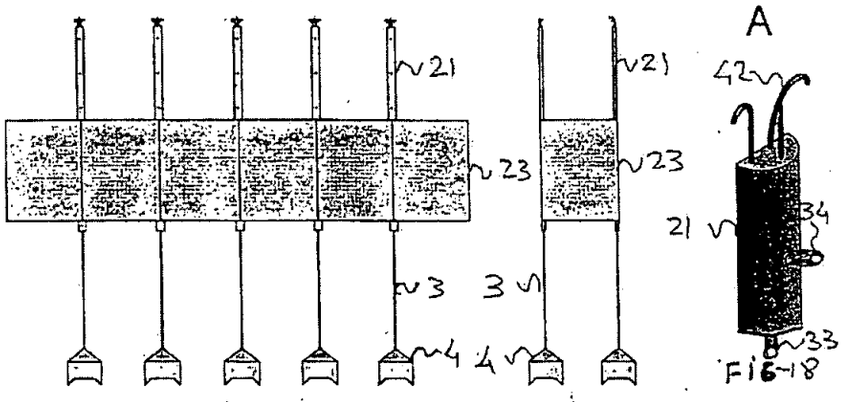


FIG-16 FIG-17 FIG-18

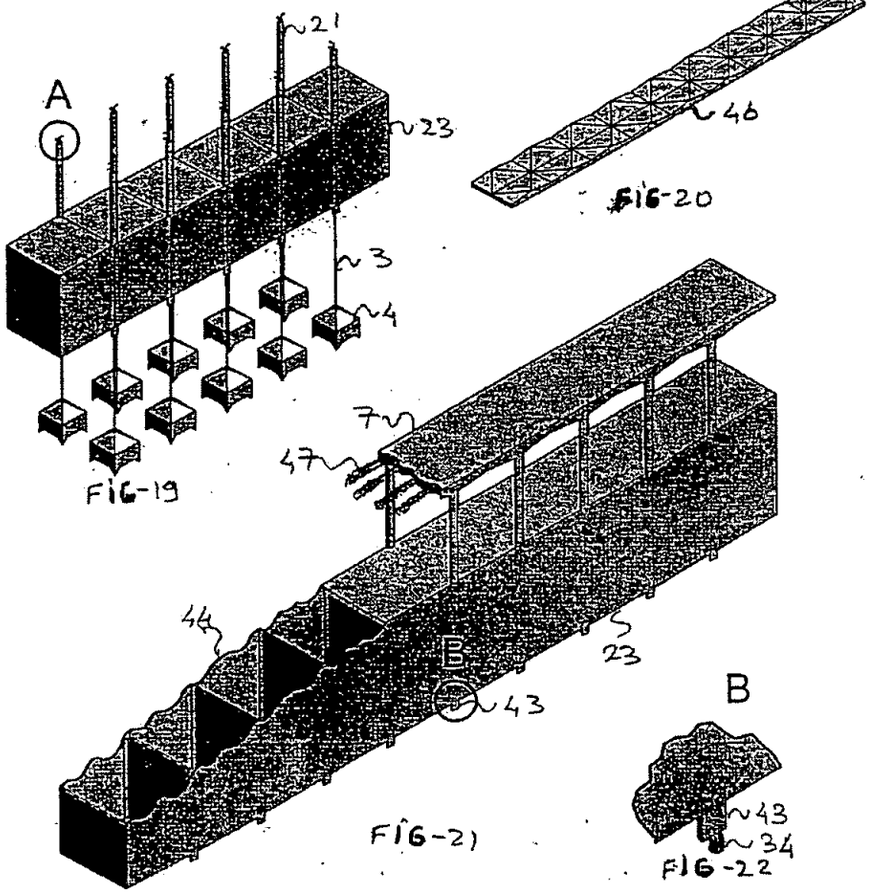


FIG-19 FIG-20 FIG-21 FIG-22

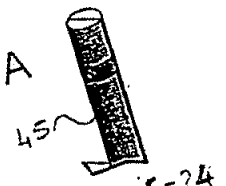


FIG-24

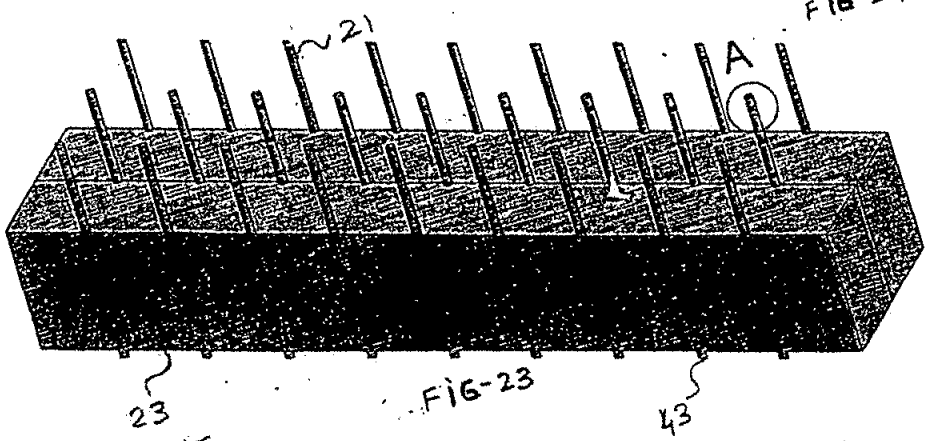


FIG-23

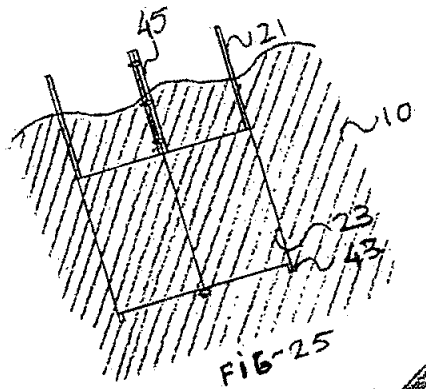


FIG-25

FIG-26

FIG-27

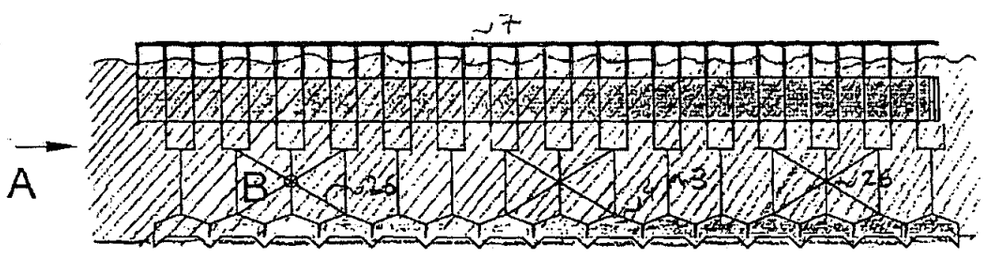


FIG-28

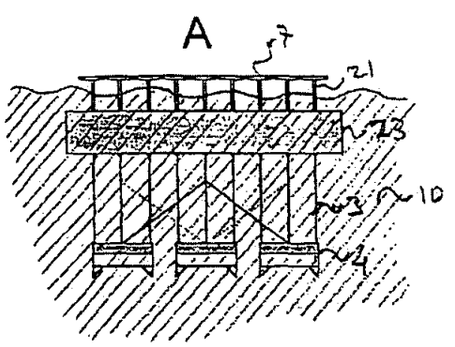


FIG-29

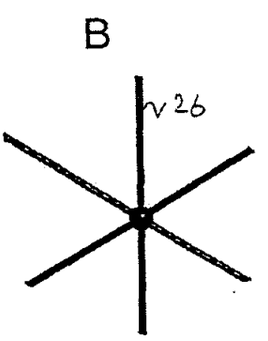


FIG-30

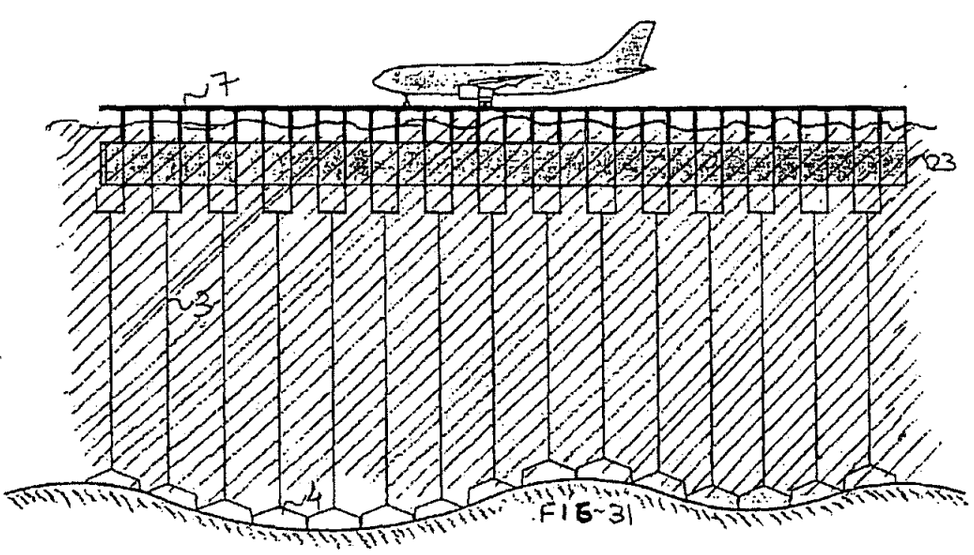
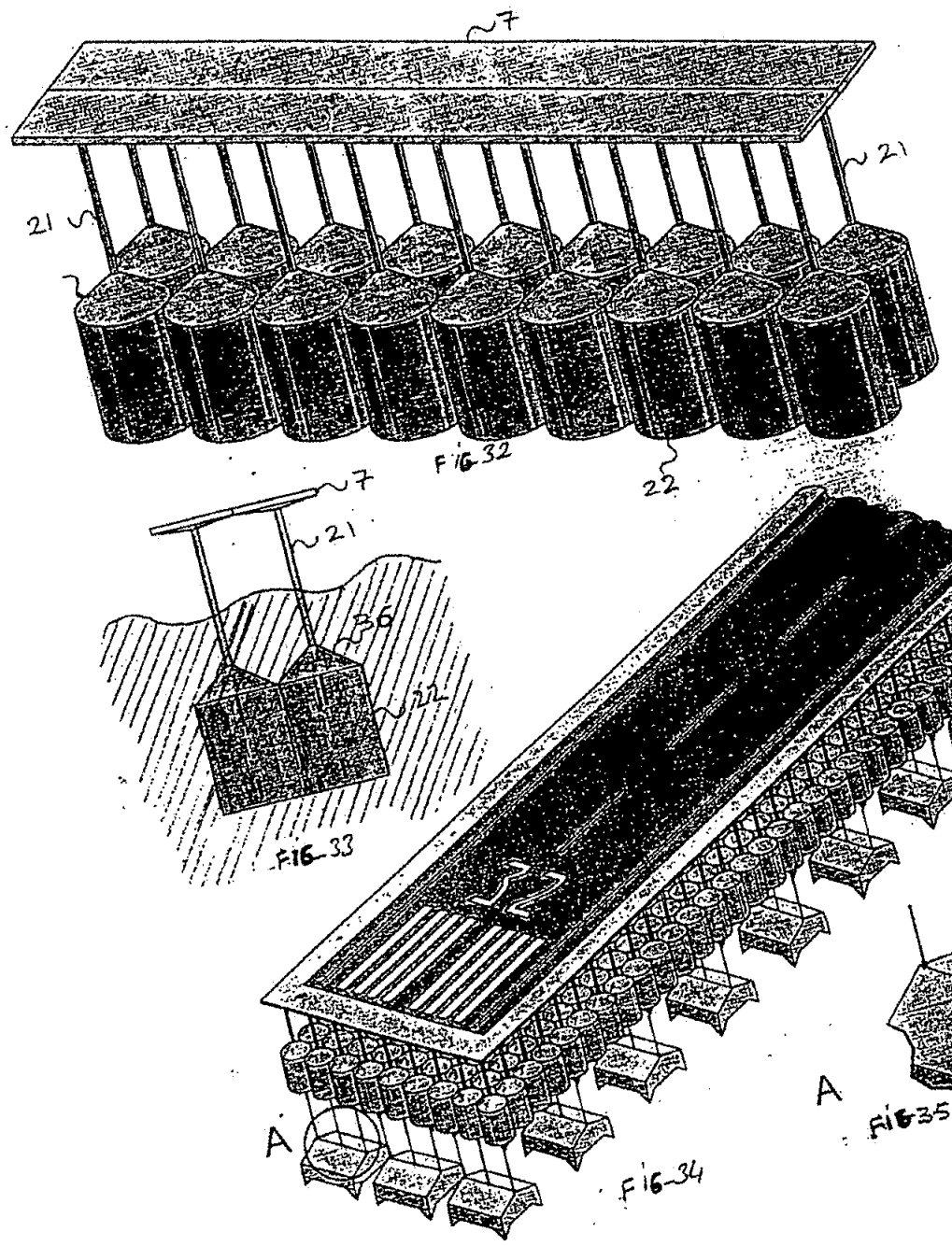


FIG-31



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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
28 June 2007 (28.06.2007)

PCT

(10) International Publication Number
WO 2007/073359 A2

(51) International Patent Classification: Not classified

(21) International Application Number:
PCT/TR2006/000072

(22) International Filing Date:
20 December 2006 (20.12.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2005/05181 23 December 2005 (23.12.2005) TR

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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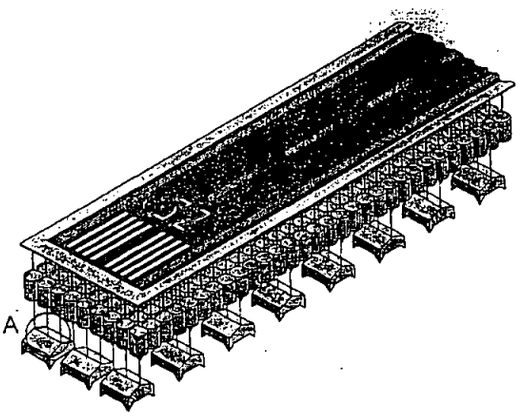
(54) Title: FIXED STRUCTURE PLATFORM ON WATER



(57) Abstract: The invention relates to the fixed platform which enables to locate on the water any fixed structure such as the house, garden, road, airport, car park, children's park and holiday village in the seas, lakes and rivers. Our invention comprises the platform (7) where the floats (22) thereof capable of floating are submerged up to a safe zone 3-5 m from the water (10) surface, the floats (22) spending energy to come out on the water surface (5) produce forces to try to maintain the platform (7) always at the same point owing to the tightness of the ropes (3) of the floats (22) and where said platform (7) is prevented from being drifted by the violent storms and huge waves and the currents in the sea, wherein the platform (7) which is manufactured in a manner suitable for its purpose comprises the weight (4) to the end of which the ropes (3) are connected, the connecting ropes (3) serving to maintain the floats (22) at a constant distance from the floor and in submerged state, the floats (22) producing the buoyancy carried over by the platform (7), the carrier columns (21) connecting the floats (22) with the platform (7) and the connecting pieces (20) that connect the columns (21) with the platform (7).

WO 2007/073359 A2

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INCE, Alpay
Postane Mah., G. 30 Sok., Tuna
Villalari, No:2
Tuzla
Istanbul
TURQUIE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference ALPAY-PCT-1	Date of mailing *(day/month/year)* 13/06/2008 **FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/TR2006/000072	International filing date *(day/month/year)* 20/12/2006
Applicant INCE, Alpay	

1. [x] The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Fascimile No.: (41-22) 338.82.70

   For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. [ ] With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   [ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

   [ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.

   See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Diana Portabella Llinares

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
ALPAY-PCT-1		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/TR2006/000072	20/12/2006	23/12/2005
Applicant		
INCE, Alpay		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the language, the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. [ ] Certain claims were found unsearchable (See Box No. II)

3. [ ] Unity of invention is lacking (see Box No III)

4. With regard to the title,
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established by this Authority to read as follows:

5. With regard to the abstract,
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the drawings,
   a. the figure of the drawings to be published with the abstract is Figure No. 34
      [X] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [ ] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No
PCT/TR2006/000072

A. CLASSIFICATION OF SUBJECT MATTER
INV. B63B9/06 B63B35/44 B63B35/50

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 399 611 A (ARMSTRONG EDWARD R) 7 May 1946 (1946-05-07) the whole document	1-16
X	US 1 847 551 A (BRAYMAN NOAH D ET AL) 1 March 1932 (1932-03-01) the whole document	1-16
X	US 1 670 524 A (SACHS GUSTAVE M) 22 May 1928 (1928-05-22) page 1, right-hand column, line 92 - page 3, left-hand column, line 22; figures	1
A	US 1 511 153 A (ARMSTRONG EDWARD R) 7 October 1924 (1924-10-07) the whole document	1-16

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
5 June 2008	13/06/2008

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Nicol, Yann

2

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/TR2006/000072

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2399611	A	07-05-1946	NONE	
US 1847551	A	01-03-1932	NONE	
US 1670524	A	22-05-1928	NONE	
US 1511153	A	07-10-1924	NONE	

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

	Date of mailing *(day/month/year)* see form PCT/ISA/210 (second sheet)
Applicant's or agent's file reference see form PCT/ISA/220	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/TR2006/000072	20.12.2006	23.12.2005

International Patent Classification (IPC) or both national classification and IPC
INV. B63B9/06 B63B35/44 B63B35/50

Applicant
INCE, Alpay

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	see form PCT/ISA/210	Nicol, Yann Telephone No. +49 89 2399-2984

Form (PCT/ISA/237) (Cover Sheet) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/TR2006/000072

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material:

      ☐ on paper

      ☐ in electronic form

   c. time of filing/furnishing:

      ☐ contained in the international application as filed.

      ☐ filed together with the international application in electronic form.

      ☐ furnished subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/TR2006/000072

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-16
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-16
Industrial applicability (IA)	Yes:	Claims	1-16
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (SEPARATE SHEET)

International application No.
PCT/TR2006/000072

Re Item V.

1. The following documents are referred to in this communication:
   D1: US-A-2 399 611 (ARMSTRONG EDWARD R) 7 May 1946 (1946-05-07)
   D2: US-A-1 847 551 (BRAYMAN NOAH D ET AL) 1 March 1932 (1932-03-01)
   D3: US-A-1 670 524 (SACHS GUSTAVE M) 22 May 1928 (1928-05-22)
   D4: US-A-1 511 153 (ARMSTRONG EDWARD R) 7 October 1924 (1924-10-07)

2. INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is **not new in the sense of Article 33(2) PCT**.
Document D1 discloses (the references in parenthesis applying to this document):

a fixed platform (11,13) comprising:
- submerged floats (19,21,23),
- ropes (37,101) that connect the floats with weights (41,93)
- columns (see figure 1 for example) connecting the floats with the platform,
- connecting pieces between the columns and the platform.

As a consequence, it is considered that the subject matter of claim 1 is not new.

2.2 Documents D2-D3 discloses also all the features of claim 1.

3. DEPENDENT CLAIMS 2-16

Most of the features of the dependent claims are well known by the man skilled in the art and even if some of them are not disclosed explicitly in D1-D2, they are considered to be implicitly disclosed.
Dependent claims 2-16 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step in the meaning of Article 33(2) and (3) PCT (see indications of the search report).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (SEPARATE SHEET)

International application No.
PCT/TR2006/000072

Re Item VII.

Contrary to the requirements of Rule 5.1(a)(ii) PCT, **the relevant background art disclosed in the documents D1 and D2** is not mentioned in the description, nor are this/these document/s identified therein.

Re Item VIII.

The claims do not meet the requirements of Article 6 PCT because there are some important of clarity problems.

1. The wording of claim 1 should not start with the wording "the invention relates to".

2. Every features or elements mentioned in the claims should be clearly defined in the claims and when referring the first time to a feature, an indefinite article (like "a") should be used. When the element or the feature has been previously defined, a definite article (like "the") should be used. In the present claim 1 (but this problem appears also in the other claims), this clarity requirement is not met because the platform, the floats, the ropes, the weight, the carrier columns, the connecting means (ect..) are not correctly defined.

May 7, 1946. E. R. ARMSTRONG 2,399,611

SUBMERSIBLE SEADROME

Filed May 14, 1942 6 Sheets-Sheet 1

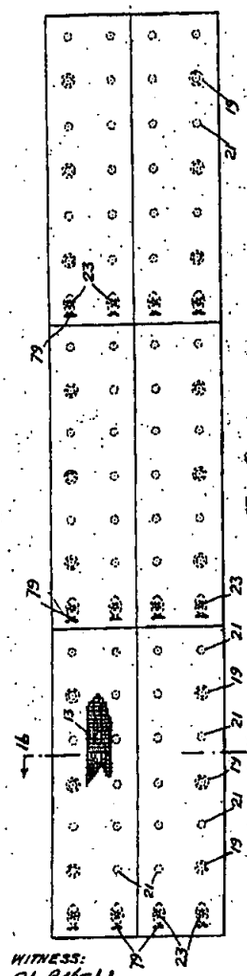


FIG. 2.

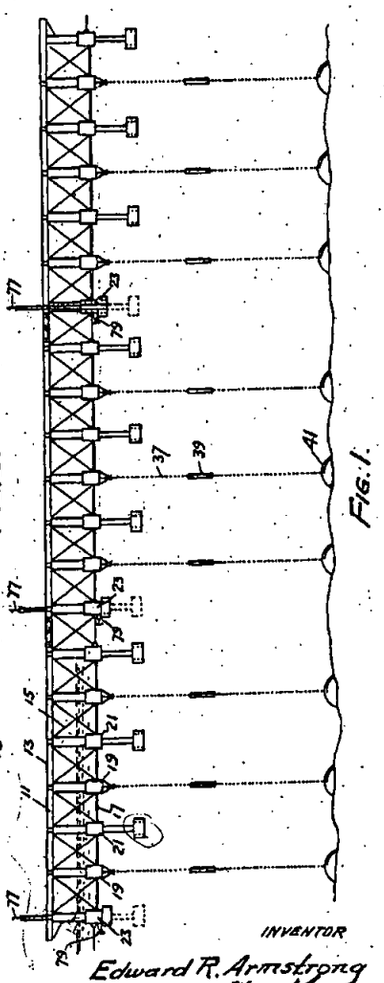


FIG. 1.

WITNESS:

INVENTOR

Edward R. Armstrong

BY

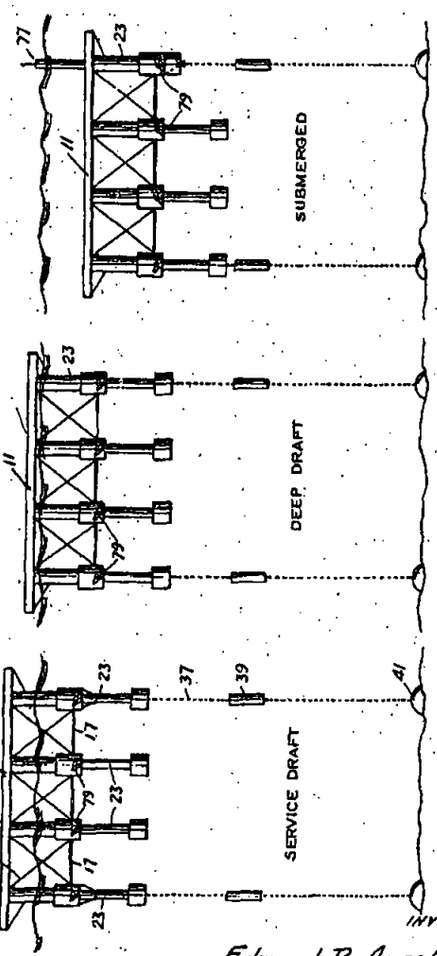
Bacon & Thomas

ATTORNEYS.

May 7, 1946. E. R. ARMSTRONG 2,399,611

SUBMERSIBLE SEADROME

Filed May 14, 1942 6 Sheets-Sheet 2



WITNESS:

INVENTOR

Edward R. Armstrong

BY Bussur & Harding

ATTORNEYS.

May 7, 1946. E. R. ARMSTRONG 2,399,611

SUBMERSIBLE SEADROME

Filed May 14, 1942 6 Sheets-Sheet 3

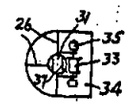


FIG. 7.

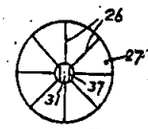


FIG. 8.

FIG. 6.

WITNESS:

INVENTOR

Edward R. Armstrong

BY

ATTORNEYS.

May 7, 1946. E. R. ARMSTRONG 2,399,611

SUBMERSIBLE SEADROME

Filed May 14, 1942 6 Sheets-Sheet 4

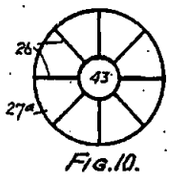


FIG.10.

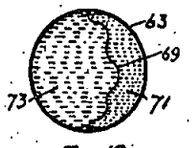


FIG.12.

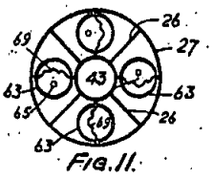


FIG.11.

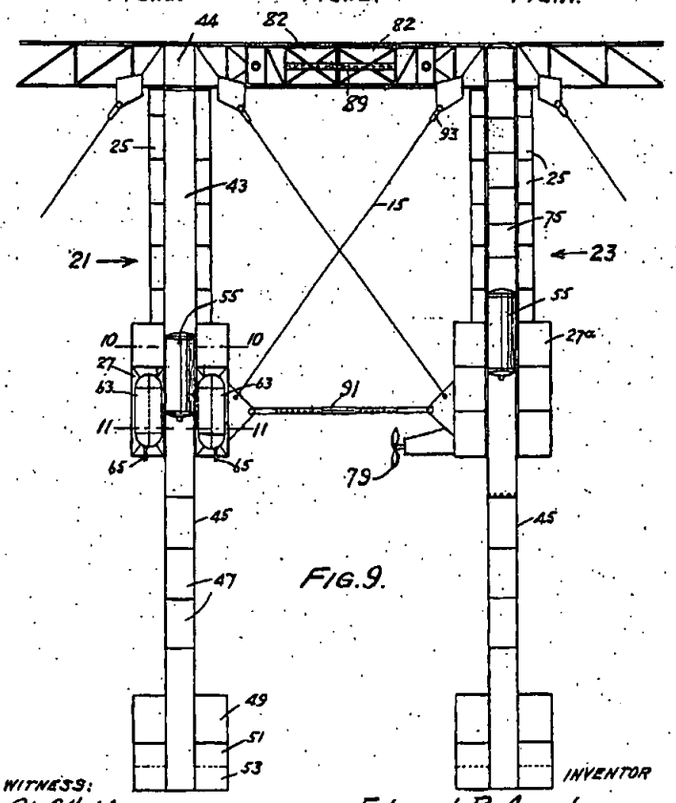


FIG.9.

WITNESS:

INVENTOR

Edward R. Armstrong

BY

Bacon & Thomas.

ATTORNEYS.

May 7, 1946. E. R. ARMSTRONG 2,399,611

SUBMERSIBLE SEADROME

Filed May 14, 1942 6 Sheets-Sheet 5

FIG. 13A.

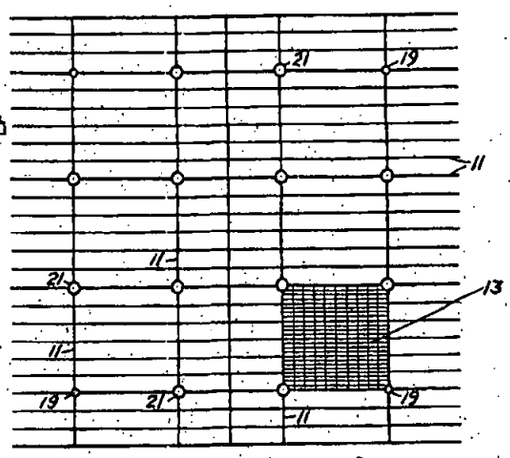


FIG. 13.

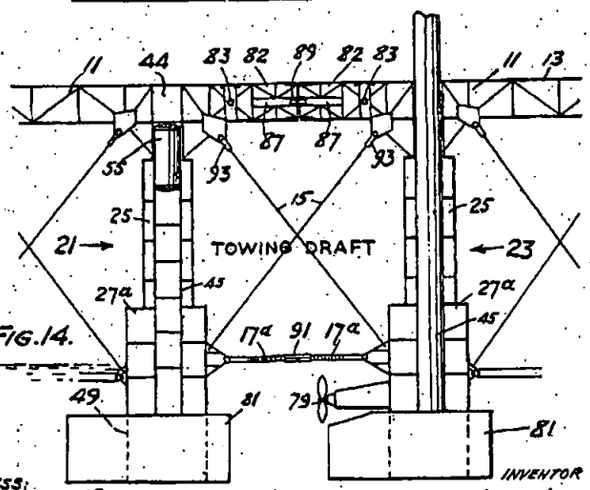


FIG. 14.

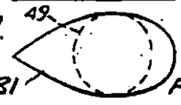


FIG. 15.

WITNESS:

INVENTOR

Edward R. Armstrong

BY

ATTORNEYS.

May 7, 1946. E. R. ARMSTRONG 2,399,611

SUBMERSIBLE SEADROME

Filed May 14, 1942 6 Sheets-Sheet 6

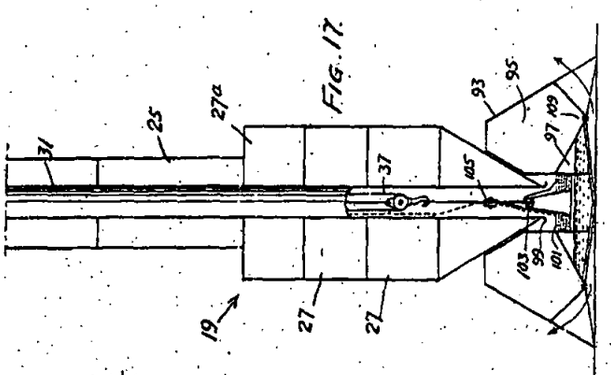


FIG. 17.

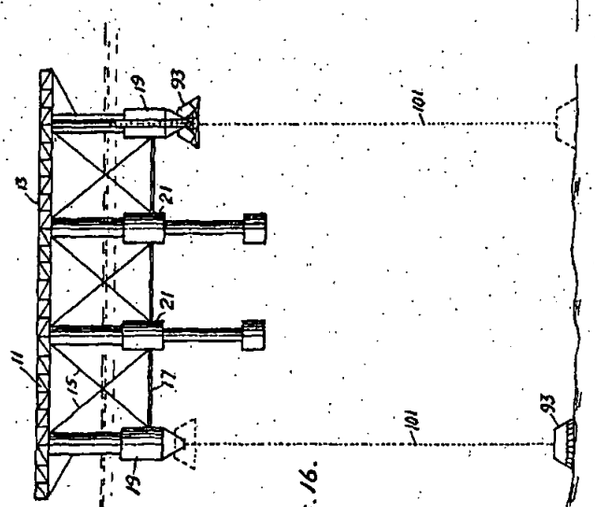


FIG. 16.

WITNESS:

INVENTOR

Edward R. Armstrong

BY

ATTORNEYS.

Patented May 7, 1946 2,399,611

UNITED STATES PATENT OFFICE

2,399,611

SUBMERSIBLE SEADROME

Edward R. Armstrong, Overbrook, Pa.

Application May 14, 1942, Serial No. 443,997

5 Claims. (Cl. 114—43.5)

This invention is directed to an improved submersible-type seadrome, particularly designed for use at sea as a servicing and refueling base for aircraft in wartime.

It is generally agreed that during time of war the use of normal seadrome-type structures at sea as refueling and servicing bases for aircraft would be of great strategic value were it not for their vulnerability to air attack. This is due to their large area, lack of mobility, and the relatively unprotected position that their use as airports in such service would entail. To eliminate this hazard, which now limits their usefulness, the standard seadrome design has been modified in accordance with the present invention so that a structure of this type can be quickly and safely submersed below the surface of the ocean to that depth necessary to render bombing from the air ineffective, even if its general location should become known to the enemy.

It is therefore the object of the present invention to provide a seadrome-type structure which will possess the necessary stability when in use, and yet can be readily and rapidly submerged beneath the ocean surface to a depth sufficient to afford the protection desired.

This object is accomplished, broadly, by the provision of a seadrome structure having very considerably residual buoyancy which is anchored to the sea bottom through the medium of "haul down" mechanism.

The construction and operation of such a structure will be apparent from the following description, read in conjunction with the accompanying drawings, in which:

Figure 1 is a diagrammatic side elevation of the seadrome structure, anchored to the sea bottom, and riding at normal service draft.

Figure 2 is a diagrammatic plan view of the structure shown in Fig. 1.

Figure 3 is a diagrammatic end elevation of the structure shown in Fig. 1, showing it riding at normal service draft.

Figure 4 is a similar view of the same structure, showing it riding at deep draft.

Figure 5 is a similar view of the same structure, showing it submerged.

Figure 6 is a diagrammatic view of a portion of the seadrome structure showing two types of buoyancy units used.

Figure 7 is a sectional view on the line 7—7 in Fig. 6.

Figure 8 is a sectional view on the line 8—8 in Fig. 6.

Figure 9 is a diagrammatic view of a portion of the seadrome structure showing a third type of buoyancy unit and associated storage space.

Figure 10 is a sectional view on the line 10—10 in Fig. 9.

Figure 11 is a sectional view on the line 11—11 in Fig. 9.

Figure 12 is a sectional view through one of the storage tanks shown in Fig. 11.

Figure 13 is a diagrammatic plan view of a portion of the deck structure.

Figure 13A is a detail view of the deck grid.

Figure 14 is a diagrammatic view of a portion of the seadrome structure showing the releasable connections between sections, and the buoyancy units as arranged at towing draft.

Figure 15 is a sectional view on the line 15—15 in Fig. 14.

Figure 16 is a diagrammatic sectional view on the line 16—16 in Fig. 3, showing a modified type of anchoring mechanism.

Figure 17 is a detail diagrammatic view of the type of anchor shown in Fig. 16.

The seadrome structure in accordance with this invention will preferably comprise a plurality of substantially identical sections releasably secured together to form a structure of desired size. In Figs. 1 and 2 three such sections are secured together. Each section may, for example, have a deck surface of 400 by 700 feet, so giving a total deck surface for the seadrome of 400 by 2100 feet.

Each section comprises a deck structure formed from longitudinal and transverse trusses 11 which support a grid 13 provided with rather large openings to facilitate easy submergence and emergence. The deck structure is secured to and supported by a plurality of buoyancy units, 28 to a section, spaced at, for example, 100 ft. intervals, and the entire structure is braced by diagonal struts 15 and longitudinal and transverse ties or struts 17.

The buoyancy units, while all generally similar, are of three distinct types, designated as 19, 21 and 23 respectively. All of these buoyancy units comprise a plurality of annular compartments 25 forming the main buoyancy tanks, and a plurality of larger annular compartments 27 positioned below the compartments 25. All compartments are provided with radial partitions 29. The uppermost of the compartments 27, designated 27a, is provided with means for flooding and for blowing out, and forms an auxiliary buoyancy tank. The lower compartments 27 serve as fuel, etc., storage compartments.

The buoyancy units 19, of which there are six

for each section, are provided with haul down mechanism, as shown in Fig. 6. A crown block 29 is secured to the deck structure immediately above the central aperture 31 through the buoyancy unit defined by the compartments 25, 27. A winch 33 is positioned within a compartment 34 communicating with aperture 31 and is driven by two electric motors 35, as shown in Fig. 7. The aperture 31 is tightly sealed at the top, as is compartment 34, so that the pressure of air trapped therein may protect the winch system from immersion in water during submergence of the structure. The tackle 37 extends down through the opening 31 and is adapted to be connected to the anchorage cable support buoys 39. Anchorage is secured by means of weight type anchors 41 of the type customarily employed for seadrome anchorage. The haul down mechanism is essentially similar to that used to support the drill stem in the drilling of oil wells, and is designed to exert a down-haul of over 175 tons, and to maintain a uniform tension on the winch lines during emergence.

The buoyancy units 21, of which there are 18 for each section, have a central aperture 43 defined by the compartments 25, 27, of larger diameter than that of the haul down units 19. As shown in Fig. 9, this aperture is adapted to receive the column 45 of a ballast unit, which can be telescoped within the buoyancy unit. The ballast unit comprises a column 45 which is divided into compartments 47, and two cylindrical ballast tanks of larger diameter. The upper ballast tank 49 may be flooded or blown out, while the lower tank 51 is adapted to contain suitable ballast 53. A compressed air reservoir 55 is secured in the upper end of column 45 and suitable connection is made with ballast tank 49 and auxiliary buoyancy tank 21a. Locking means may be provided for locking together, when desired, the buoyancy unit 21 and the associated ballast unit. A storage compartment 44 closes each aperture 43 at the top.

The compartments 27 of the buoyancy units may be arranged for fuel and oil storage as shown in Figs. 9 to 12. Within each of the sections into which the compartment 27 is divided by partitions 26 is positioned a storage drum 63. A flexible, expansible diaphragm 69, of oil and gasoline resistant material, as neoprene, Thiokol, etc., divides the drum 63 vertically into a fuel storage chamber 71 and a chamber 73 open to the sea through connections 65.

Fuel is pumped into the chambers 71 against the hydrostatic pressure resulting from the difference in specific gravities, and is discharged at need to the flight deck by such pressure. The construction shown also minimizes change in buoyancy on dispensing large amounts of fuel or oil, and serves to strengthen the buoyancy tank structure to resist under-water explosions, since the internal and external pressures are to some extent equalized.

The power units 23, of which there are four for each section, arranged along the after edge of the section, are identical with units 21 except for the omission of storage compartments 44, and in that the column 45 of the ballast unit is continued above the compressed air tank 55 to form compartments 75, and propulsion units 79 are secured to the buoyancy tank structure 21.

The several compartments 75 serve to provide living quarters for the crew, engine room space for Diesels to supply power requirements when not submerged, and a control room. The propulsion units 79 comprise screws driven by electric motors, powered ordinarily from generators driven by the Diesels. The generators may also serve to charge batteries to drive the winch motors 35 and the compressor motors for the air compressors, located in the control units, which supply air to the tanks 55 of all units.

The control mechanism in each unit 23 will govern the submergence and emergence of each unit 23, and of the seadrome as a whole. By blowing out the ballast tank 49 of any control unit 23, the compartments 75 may be raised high above the flight deck, as shown in Fig. 6, or may be brought above the ocean surface while the seadrome as a whole remains submerged, as shown in Fig. 5. The air compressors can thus be operated even when the seadrome is submerged. Periscope mechanism 77, which may be raised or lowered from the topmost compartment 75, permits the necessary observation before emergence.

Means for locking the several seadrome sections together are shown schematically in Figure 14. Secured to an extension of the truss system 11 of each adjoining section is a comparatively short truss member 82. The connection is such that members 82 are free to move somewhat about their connection 83 with the truss system 11 as a pivot. The two truss members 82 are secured together, with plates carried thereby overlapping one another, by a yielding connection. Thus each truss member 82 may carry a draft bar 87, and the two draft bars may be connected by heavy automatic couplers 89 of the type used in railway draft gear, with the usual spring connections to absorb violent stresses.

The cross struts 17a may be similarly connected by automatic couplers operating within a sleeve 91. The diagonal stays or braces 15 may be secured to the truss system 11 by releasable connections 93. by these means the several sections of the seadrome may be quickly released in emergency, while readily assembled on location.

Instead of utilizing permanently located anchors 41 marked by buoys 39, special anchors may be carried by the buoyancy units 19, as shown in Figs. 16 and 17.

Each of the anchors 93 is formed as a shell divided into a plurality of radial sections, each of which in turn is divided into a buoyancy compartment 95 and a ballast compartment 97. A central section 99 forms a cable tank. One end of the cable 101, which may be sectionalized for easy shortening or lengthening, is attached to the anchor terminal 103; the other end, to the tackle 37 of the haul down mechanism. A releasable clamp 105 may be used to clamp the ends of cable 101 together to hold the anchor in raised position. An air hose 107 may be clipped to the cable 101 and connected with the buoyancy compartments 95 of the anchor. Vents 109, so positioned as to be free from danger of clogging, permit the buoyancy compartments to be flooded or blown out, and serve to equalize internal and external pressures.

Each anchor 93 is designed to have a net effective weight when flooded of 200 tons, and to be free floating when the buoyancy tanks are completely blown out. The ballast in compartment 97 preserves the trim. The reserve buoyancy of the airdrome, when submerged, will be about 135 tons per anchor.

The seadrome will proceed under its own power, or may be towed to the anchorage site, each section proceeding separately. To facilitate such operation, the structure should be positioned so

as to have as little draft as possible. This object may be accomplished by blowing out the water from the ballast tanks 49 of each ballast unit so that the unit will rise until it reaches the bottom of the coresponding buoyancy unit, with its column 45 telescoped within the central aperture 43 of the buoyancy unit. At the same time the auxiliary buoyancy tanks 27a will be blown out so as to give maximum buoyancy to the structure. In this condition the seadrome will ride substantially in the position shown in Fig. 14.

It may be desirable, in order to reduce drag, to provide each of the ballast units with a fairwater 61 surrounding the tanks 49 and 51, as shown in Figs. 14 and 15.

When the several sections of the seadrome have arrived at the anchorage site selected, which will ordinarily be in water not exceeding 200 fathoms in depth, the several sections are locked together in the manner described above, and the haul down lines 37 secured to the anchorage cable buoys. At substantially the same time, the ballast units will be lowered by flooding the ballast tanks 49 so that they will assume the position shown in Fig. 1, in which position they may be locked. This operation insures that the center of gravity will be below the center of buoyancy and thus insures stability in the seadrome.

If anchors of the type shown in Figs. 16 and 17 are used, the anchors will be placed in position beneath the buoyancy units 19 before the several sections of the seadrome leave the shipyard. The anchor once in place can be given sufficient buoyancy to retain it firmly in position. If desired, the clamps 105 may be set and a tension of about 50 tons placed on the haul down system, to hold the anchor more securely. When the anchorage site is reached the clamps 105 will be released, and the compartments 95 flooded, whereupon the anchor will sink to the bottom at a controlled rate, paying out cable 101 from tank 99 as it sinks.

In either case, after anchoring has been accomplished the several haul down winches 33 in the haul down buoyancy units 19 are then operated to bring the seadrome into the desired surface position. In this position, which is shown in Fig. 3, the flight deck will be approximately 60–65 feet above the water level, a height sufficient to provide ample clearance for even the greatest ocean waves. By proper adjustment of the auxiliary buoyancy tanks 27a, the seadrome will be given a residual buoyancy of about 3,000 tons, which is absorbed uniformly by the haul down cables.

This residual buoyancy may be changed at will; for example, in anticipation of the landing of a large flight of aircraft. Thus, for example, it is easily possible, by continuing the blowing out of the auxiliary buoyancy tanks 27a, to give an additional 1200 tons of buoyancy. This would permit the landing of a squadron of sixty 20-ton bombers upon the flight deck, with no change in the trim or water line of the seadrome, the only change being in the tension on the haul down cables.

When it is desired to submerge the seadrome, the auxiliary buoyancy tanks 27a are flooded. This action alone will bring the seadrome into the position indicated in Fig. 4 with the flight deck just above the water level. The haul down winches are then operated to cause the structure to submerge, and the operation is continued until the flight deck is about 50 feet below water level, as shown in Fig. 5.

When the seadrome is in submerged position, the operators in any of the control rooms 75 can, by blowing the ballast tank 49 of the associated ballast unit, cause the control room to be raised above the level of the flight deck, if desired, to an extent that the upper portion will be above water level. Before causing the control room to emerge above water level, the periscope equipment contained therein may be utilized to make the desired observations.

The operators, from the control rooms, may cause the emergence of the seadrome by releasing the haul down tension and blowing out the auxiliary ballast tanks 27a with the compressed air contained in the tanks 55. This action will cause the rapid emergence of the seadrome to its normal water line (that shown in Fig. 3) in about twelve minutes, assuming an emergence speed of something less than ten feet per minute. Level and regular emergence is maintained by insuring uniform tension on the haul down winch lines. The winches, as previously indicated, are of the type which permits a uniform and regulable tension to be maintained at all times upon the winch line during operation.

After emergence to the normal water line, the haul down tension may be equalized, if that seems to be necessary, and then held while the operation of the blow tanks may be continued, as previously described, to produce additional buoyancy to take care of the landing of planes.

During the time that the seadrome is above the surface, the air compressors 53 are operated to charge the blow tanks 55 with compressed air ready for use on the next submergence.

It will be appreciated that the several blow tanks 55 may all be interconnected with one another with suitable valves so that any or all of the blow tanks may be used for blowing water out of any or all of the auxiliary buoyancy tanks 27a or ballast tanks 49. The required remote control mechanism for operation of the buoyancy, ballast and blow tanks, the propulsion units, the compressor motors, and the motors for the haul down winches, may be set up in interlocking arrangement, with duplicate operating controls in any number of the control rooms 75.

If, when using anchorage of the type shown in Figs. 16 and 17, it should be desired to change the anchorage position while in the service draft, the winch system would be used to put a strain of from 200 to 250 tons on each anchor in succession. Should the bottom suction (so-called) be such that some of the anchors cannot be made to "break ground" while under this stress, the connecting hose lines 107 can be used to accomplish this purpose. By pumping water into the anchor through these lines, the flow through the outlet ports 109 may equalize the pressure. If this is not effective, compressed air may be used to make the anchor sufficiently buoyant, when combined with the winch stress, to release it from the bottom. Under the latter condition as the anchor approaches the surface, the air pressure in the buoyancy compartment 95 of the anchor would automatically equalize by expanding out through the outlet ports 109, the final buoyancy being regulated to that desired by the release of the air from the buoyancy tank 95 through the air line hose connection 107.

Should circumstances require that the anchor be retracted a greater distance than the length of the winch column 37 (the maximum distance between the crown block and the traveling block) provision is made to shorten the anchorage cable

101 in sections, in accordance with the procedure used in oil well drilling practice.

When on service duty at the ocean surface, weather conditions may develop excessive stress on the anchor cables due to their relatively vertical position. To meet this possibility, sufficient excess cable should be provided in the winch block line 21 to permit the anchor cables to be quickly lengthened, greatly reducing the stress on the cable system.

It will be appreciated that the structure described, while primarily intended as a seadrome, will possess other uses, as, for example, as an offshore drilling rig, etc.

What I claim and desire to protect by Letters Patent is:

1. A seadrome of the type described comprising a landing deck, a supporting structure therefor, a plurality of buoyancy units secured in spaced relation in and forming a part of the supporting structure, said buoyancy units in the aggregate giving the seadrome substantial residual buoyancy when riding at service draft, some of said buoyancy units having a central shaft open at the bottom and closed at the top, a closed chamber in communication with the top of each shaft, hoisting means in said shaft adapted to be connected to anchorage lines and a winch in each chamber connected to the hoisting means in the shaft.

2. A seadrome of the type described comprising a landing deck, a supporting structure therefor, a plurality of buoyancy units secured in spaced relation in and forming a part of the supporting structure, said buoyancy units in the aggregate giving the seadrome substantial residual buoyancy when riding at service draft, some of said buoyancy units having a central shaft open at the bottom, a buoyancy column slidably mounted in the shaft of some of said units, a ballast tank connected to the lower end of each of said columns, a compressed air reservoir above each column adapted to displace ballast sea water from the ballast tank, and living quarters for the crew in movable compartments in some of the shafts above the air reservoir.

3. A seadrome of the type described comprising a landing deck, a supporting structure therefor, a plurality of buoyancy units secured in spaced relation in and forming a part of the supporting structure, said buoyancy units in the aggregate giving the seadrome substantial residual buoyancy when riding at service draft, some of said buoyancy units having a central shaft open at the bottom, the lower portions of some of said units being enlarged at the lower end to form chambers for power units, a propeller mounted on the end of a shaft extending from a power unit chamber, a buoyancy column slidably mounted in the shaft of each of said units, a ballast tank connected to the lower end of each of said columns, a compressed air reservoir above each column adapted to displace ballast sea water from the ballast tank, living quarters for the crew in movable compartments above each reservoir, and a periscope extending above the upper compartment, said compartments being adapted to be elevated above the landing deck.

4. A seadrome of the type described comprising a landing deck, a supporting structure therefor, a plurality of buoyancy units secured in spaced relation in and forming a part of the supporting structure, said buoyancy units in the aggregate giving the seadrome substantial residual buoyancy when riding at service draft, some of said buoyancy units having a central shaft open at the bottom, a buoyancy column slidably mounted in the shafts of some of said units, a ballast tank connected to the lower end of each said columns, a compressed air reservoir above each column adapted to displace ballast sea water from the ballast tank, living quarters for the crew in movable compartments in some of the shafts above the air reservoir and a storage space in the deck at the top of other shafts.

5. A seadrome section of the type described comprising a landing deck, a supporting structure therefor, there being at least four rows each containing seven buoyancy units extending downwardly from and connected to the supporting structure, said units being spaced apart substantially the same distance both longitudinally and transversely beneath the deck, each of said units having a central shaft open at the lower end, the shafts of the second, third and fifth unit of the outer rows, having hoisting means therein adapted to be connected to anchorage lines, a buoyancy column slidably mounted in each of the shafts of the other units and a ballast tank at the lower end of each of said buoyancy columns.

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March 1, 1932. N. E. BRAYMAN ET AL 1,847,551

SEADROME OR AIRPLANE LANDING

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Fig. 1

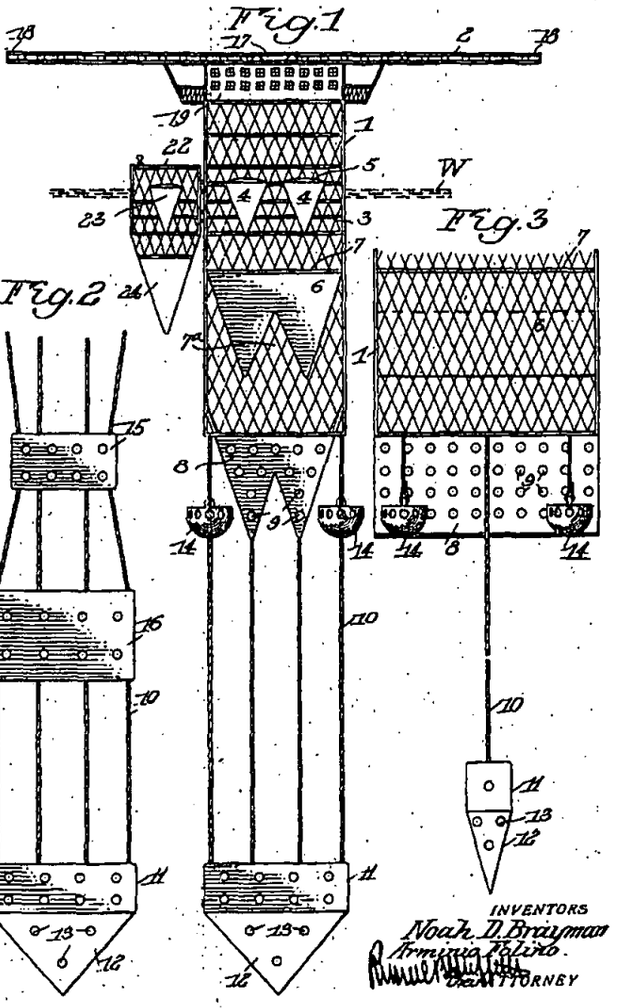

Fig. 2

Fig. 3

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SEADROME OR AIRPLANE LANDING

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Fig. 4

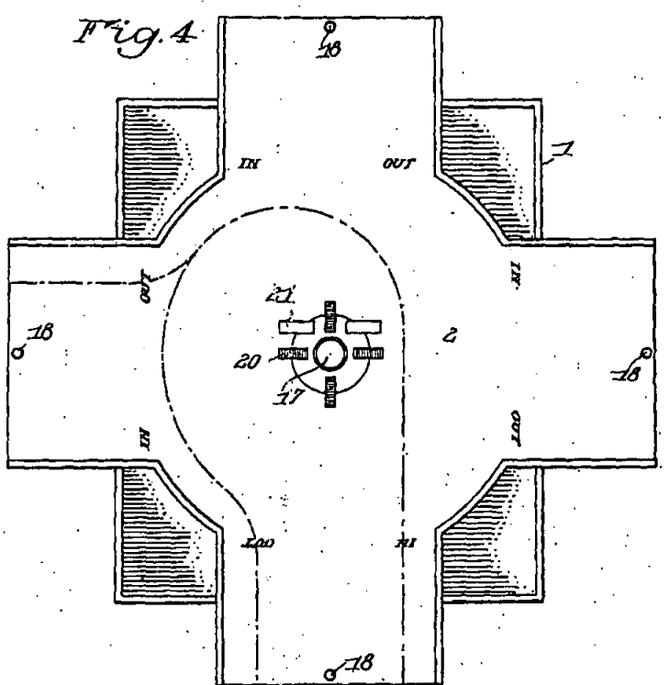

Fig. 5

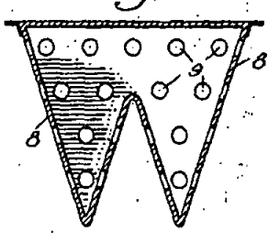

Fig. 6

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Patented Mar. 1, 1932 1,847,551

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SEADROME OR AIRPLANE LANDING

Application filed April 14, 1930. Serial No. 443,926.

Our present invention relates to airplane equipment and more particularly to landing fields therefor, and it has for its object to provide a safe and stable landing field that may be located at sea and anchored in such way as to maintain its position for the landing and taking off of amphibian and land airplanes. Features of the invention have reference to the floating of such a landing field; the anchoring thereof and the stabilizing of the landing platform in connection with these devices, so that the rolling and rocking of the floating structure is reduced to a minimum.

To these and other ends, the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a side elevation of a seadrome constructed in accordance with and illustrating one embodiment of our invention;

Fig. 2 is a fragmentary view of an additional anchoring and stabilizing structure;

Fig. 3 is a fragmentary side view, partly broken away, of the submerged portion of the device, as shown in Fig. 1;

Fig. 4 is a top plan view of the landing field;

Fig. 5 is an enlarged detailed section through one of the stabilizing elements, and

Fig. 6 is an enlarged sectional view through another of the stabilizing elements.

Similar reference numerals throughout the several views indicate the same parts.

The device in general comprises a floating structure; means for rendering it sufficiently buoyant; means for stabilizing it arranged near the surface of the water; and means for anchoring it on the sea bottom.

Referring more particularly to the drawings, 1 indicates a preferably rectangular column composed of a network of structural steel, as shown. Topping it is a landing field or platform 2 hereinafter described. At the water line, indicated at W, there is supported within the column in connection with braces 3, a plurality of cone-shaped air tanks 4 forming floats which are the main source of buoyancy. Their tops are rounded, as indicated at 5, so as to give the least resistance to the waves.

Just below these tanks is a primary stabilizing tank 6, which is filled partly with air and partly with water according to conditions. In other words, by means of an air pump or compressed air lines, air may be forced or withdrawn to expel the proportion of water or admit more water to reach a suitable balance. The top of this stabilizer tank is flat, as indicated at 7, so that it will resist to the greatest degree the rise and fall of the column due to the turbulence of the sea.

Below the primary stabilizer 6, which is of a double V conformation, as shown, to provide a dead body of water in the space 7 tending to prevent lateral motion or swaying is a secondary stabilizer 8, which is of the same general shape. This latter, however, contains no air. On the contrary, its walls are foraminous, as indicated at 9, allowing currents to flow slowly therethrough rather than offering a maximum resistance thereto.

Suspended by cables 10 from the lower end of the column 1 is the bottom anchor 11. This preferably consists of a perforated weight having a cone-shaped bottom or point 12, and the cables 10 are of the proper length to allow this anchor to imbed itself in the sea bottom, the perforations 13 permitting the sand or mud to flow into it laterally and increase its anchoring power.

We may also fit two or more of the cables 10 with upper bell anchors 14 of the construction shown in Fig. 6, which are merely weights arranged at an intermediate point in association with the secondary stabilizer 8.

Other means of weighting the cables 10, where the anchorage is particularly turbulent, are shown in Fig. 2, and consist of perforated steel blocks 15 and 16, through which the cables pass.

The landing field, indicated generally at 2, is, as shown in Fig. 4, in the general shape of a Maltese cross affording a plurality of landing and take-off paths, according to the

direction of the wings. In the center is a beacon light 17, while the ends of the runways are provided centrally with smaller beacons 18, so that the pilot may better judge the space and distance available to him.

It is also contemplated that arriving and departing passengers be provided with accommodations for their stay at the seadrome and their departure therefrom by seagoing vessels. To this end, there is provided beneath the landing field at the head of the column 1 a cabin 19 beneath the landing field 2 which may be reached from the latter by stairways 20 or elevators 21 grouped at the center about the central beacon 17. From thence, the passengers may reach a dock 22 that is suitably moored at the surface to the column 1. To conform with the mechanical arrangement of the rest of the structure, this dock 22 also preferably comprises a structural steel network; air chamber floats 23 and a stabilizer 24. It is further contemplated that this dock 22 may be veered around and attached to the leeward side of the column according to the direction of the prevailing wind.

We claim as our invention:

1. In a seadrome providing landing and take-off facilities for airplanes, the combination with a floating column, a field platform supported thereby, a buoyancy element, an anchoring device, and a stabilizing element arranged between the buoyancy element and the anchoring device, said stabilizing element consisting of a tank in the shape of a double V adapted to trap a dead body of water between its lower projections.

2. In a seadrome providing landing and take-off facilities for airplanes, the combination with a floating column, a field platform supported thereby, a buoyancy element, an anchoring device, and primary and secondary stabilizing elements arranged between the buoyancy element and the anchoring device, the first mentioned comprising an air and water tank and the last mentioned a foraminous tank through which currents of water are adapted to slowly flow.

3. In a seadrome providing landing and take-off facilities for airplanes, the combination with a floating column, a field platform supported thereby, a buoyancy element, an anchoring device comprising a foraminous weight, and cables connecting the anchoring device with the column.

4. In a seadrome providing landing and take-off facilities for airplanes, the combination with a floating column, a field platform supported thereby, a buoyancy element, an anchoring device comprising a foraminous weight, cables connecting the anchoring device with the column, and weights supported by the cables above the anchoring device.

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SEA AIR PORT

Filed Aug. 18, 1927 2 Sheets-Sheet 1

Fig. 1

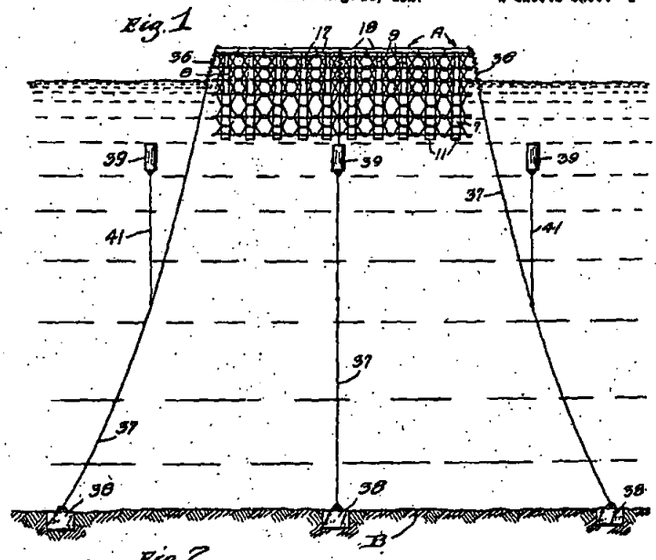


Fig. 2

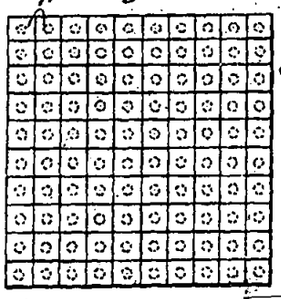


Fig. 5

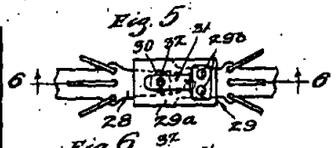
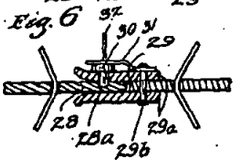


Fig. 6



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SEA AIR PORT

Filed Aug. 18, 1927 2 Sheets-Sheet 2

Fig. 3

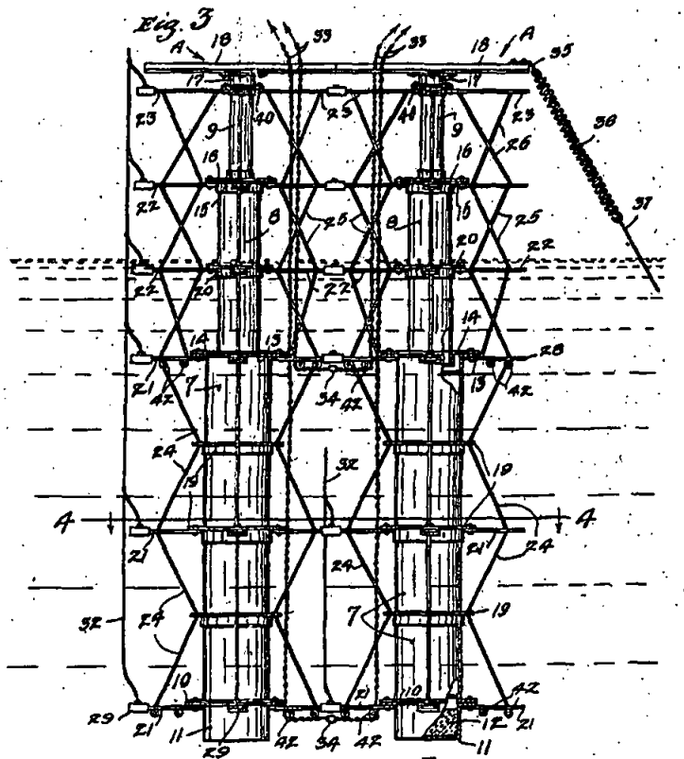
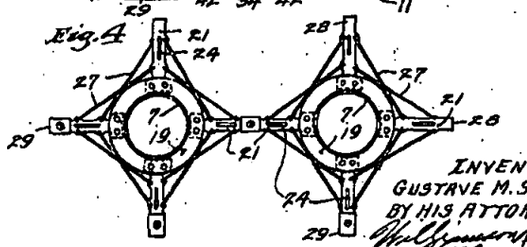


Fig. 4



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SEA AIR PORT.

Application filed August 18, 1927. Serial No. 213,827.

This invention relates to sea air ports. Recently transoceanic air transportation has been given a great stimulus and it seems quite probable that before long regular air lines will be established across the ocean. Heretofore the main drawback to the development of transoceanic air transportation has been the lack of stations in mid-ocean where the air craft could stop for refueling or for similar purposes. To date, no practical sea air port has been devised which can successfully be moored in mid-ocean to withstand the oceanic storms and waves and tide to hold its positions under all circumstances. Also no oceanic air port has been provided which is capable of being readily assembled and put together in mid-ocean.

It is an object of this invention, therefore, to provide a sea air port which is composed from a plurality of separable float units, the said units being capable of being brought to midocean and assembled together, one unit at a time.

It is a further object to provide a unit for such a device comprising a plurality of air tanks, one tank being superimposed on top of another tank, the lowermost of said tanks being adapted to extend below the water level at such a depth as to be unaffected by waves, wind or storm.

Yet another object is to provide such a unit wherein the lowermost tank is of considerably greater diameter than the uppermost tank and a ballast at the lower end of the lowermost tank lending stability to the unit.

Another object is to provide a sea air port comprising a platform formed from a series of unit floats, and means for assembling said units, one unit at a time, said means being operatable entirely above the water level.

Yet another object is to provide in such a structure, means for maintaining the platform at a constant level in respect to the top surface of the water irrespective of the state of the tide.

A more specific object is to provide a sea air port comprising a landing platform adapted to float above the top surface of the water, weighted cables extending from the platform to the sea floor and resilient means interposed in the cable lines to permit the tide to raise or lower the said platform without changing the relative distance of the platform from the top of the water.

One more object is to provide means for buoying up said cables to support part of the weight thereof.

These and other objects and advantages of the present invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the various views, and in which,

Fig. 1 is a view in side elevation showing the assembled device moored in mid-ocean;

Fig. 2 is a plan view of the landing platform;

Fig. 3 is a view in side elevation showing two of the units forming the platform in assembled relation;

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 3, as indicated by the arrows;

Fig. 5 is a plan view on an enlarged scale illustrating a type of coupling that may be used for securing two units of the device together, and;

Fig. 6 is a vertical section taken on the line 6—6 of Fig. 5, as is indicated by the arrows.

Referring to the drawings, the sea air port comprises in general a platform formed from a plurality of assembled float units A, and moored to the ocean floor B. Each unit A comprises a series of air tanks placed one on top of another, the said air tanks being successively smaller from bottom to top, and a flooring carried at the top of the uppermost air tank. In the drawings, the units A are each shown as including a large lowermost air tank 7, a medium sized middle air tank 8, and a small upper air tank 9. The tank 7 has an outwardly extending flange 10 at its bottom end to which is secured a cap 11 containing heavy material 12, such as concrete, to form a ballast at the bottom of the said tank. A flange 13 is provided at the top of tank 7 and the tank 8 is provided at its lower end with a flange 14 bolted or otherwise secured to the flange 13. Similarly, the tank 8 is provided at its upper end with a flange 15 secured to a bottom flange 16 at the lower end of tank 9. The lower ends of the said tanks 8 and 9 are adapted to fit downwardly within recesses formed in the upper ends of tanks 7 and 8 respectively to which they are joined. The upper end of tank 9 has

a flange 40 to which the lower flange of a small standard 17 is secured, said standard having a horizontally disposed flange at the top thereof to which a flooring 18 is secured in any suitable manner. The flooring 18 is preferably of square shape although, if desired, the same may take the shape of any regular polygon. The tanks 7, 8 and 9, as shown, are preferably of the hollow cylindrical type and are so arranged that their radial axes will fall in the same vertical line. It will, of course, be understood that the means for securing the tanks to each other and for fixing the ballast 12 and the flooring 18 to the lower and upper tanks respectively may be varied as desired. It will also be understood that any desired number of tanks may be substituted for the three tanks 7, 8 and 9.

In the drawings, the tank 7 is illustrated as being provided with three horizontally flanged sleeves 19 welded or otherwise secured to the tank, while the tank 8 is illustrated as having a single sleeve 20 similarly secured to the tank and having a horizontal flange. Heavily constructed arms 21 are secured to each of the flanges 10 and 13 and the center flange 19. The said arms are four in number secured to each of said flanges, are disposed radially in respect to the tank 7, and are set at 90 degree angles to each other. Arms 22 are similarly secured to each of the flanges 20 and 15 of tank 8, while arms 23 are similarly secured to the flange 40 of tank 9. The various arms 21, 22 and 23 extend outwardly from the various tanks 7, 8 and 9 to terminate at equal radial distances from the concentric center of said tanks, and the said arms are vertically alined with each other in four planes set at 90° angles to each other. Diagonal bracing rods 24 disposed in vertical planes extend between the outer ends of the various arms 21 and the sleeves 19 to which the arms are not otherwise secured. Similar diagonal bracing rods 25 disposed in vertical planes extend between the outer ends of arms 22 and the upper arms 21 to the flanges 13, 20 and 15, while similar diagonal bracing rods 26 extend between the outer ends of the upper arms 22 and the arms 23 to the flange 15 and to the flange 40. Suitable bracing rods 27 extend between the outer ends of the various arms 21, 22 and 23 to the inner ends of adjacent arms, the said bracing rods 27 being disposed in substantially horizontal planes. It will be understood that the number and type of arms 21, 22 and 23 and the bracing therefor may be varied as desired.

The outer ends of the arms 21, 22 and 23 are provided with suitable male and female coupling portions, whereby the arms of one unit may be connected up with the arms of adjacent units. Preferably, two arms secured to each flange will be provided with male coupling portions 28 while the two other arms will be provided with female coupling portions 29, so that oppositely extending arms will carry one male coupling portion and one female coupling portion. To form the male coupling portion 28 said various arms are merely extended and provided with rounded end portions and with recesses 28^a at their upper sides. To form the female coupling portions horizontally extending plates 29^a are provided which are bolted or riveted as by rivets 29^b to the outer ends of the said arms. The said plates 29^a are outwardly bent from each other at their outer ends and are spaced from each other to form recesses within which the male coupling members 28 are adapted to fit. Pins 30 are provided which fit through openings on the upper plates 28^a and are spring pressed by bar springs 31 to hold the same projecting between the opening between the two plates 29^a. It will be seen that as the male coupling member 28 is pressed into the female coupling member 29 that the rounded end of the male member will force the pin 30 upwardly against the tension of spring 31 thereby causing the pin to be forced downwardly into the recess 28^a to lock the members together after being brought further together. Cables 32 are connected to each of the pins 30 disposed in a single vertical plane and extend from the lowest arm 21 to adjacent the flooring 18. By moving the cable 32 vertically upwardly all the pins 30 connected to the cable can be raised against the tension of springs 29 out of engagement with the various recesses 28^a to permit release of the male and female coupling members. The type of coupling used may be varied as desired.

Chains or cables 33 are provided on each unit which are adapted to be connected by links 34 to similar chains 33 of adjacent units to afford means for pulling and securing the said units together. The chains 33 extend downwardly through the flooring 18 to pulleys 42 fixed to the lowermost and uppermost arms 21 of the bottom tank and before assembly the chains are extended upwardly from said pulley to the outer side of the platform 18. When it is desired to assemble two of the units A the two units are turned so that male coupling members of one unit oppose female coupling members of another unit. The ends of chains 33 at the sides of the platforms 18 are then connected by means of the links 34 and allowed to drop, whereupon by pulling the other ends of the chains the two units will be drawn toward each other to cause the various male couplings on one side thereof to engage with female couplings on the opposing side of the other unit. After the units have been so drawn together chains 33 may be securely fastened to assist in binding the said units

together and retaining the same in assembled position.

After the whole float platform of the air port has been assembled, unit by unit, in such a manner it becomes desirable to moor the platform. Preferably the middle units on each side of the platform of the device will be provided with brackets 35 at their outwardly projecting edges and some resilient means such as the coiled spring 36 illustrated in the drawings will be connected at one end to the brackets 35. Long cables 37 will be secured at their upper ends to the other ends of said resilient means and extend downwardly therefrom to the sea floor and will have secured thereto at their lower ends weights 38 resting on the sea floor. Float tanks 39 are preferably provided, which are connected by cables 41 to said cables 37 at medial points thereon to assist in carrying the weight of said cables.

When a number of the units A have been assembled as indicated in Fig. 2, a smooth and even surfaced air craft landing field will be provided. The field can, of course, be laid out to form hangars, sleeping accommodations, etc., if desired.

In practice, the various air tanks 7, 8 and 9 will be of such size as to sustain the platform at a height above the water level sufficient so that the highest waves caused by the worst storms will never strike the bottom of the platform formed by the floorings 18. The bottom tanks 7 will be sunk in the water so deep by means of the ballast 12 that movement of the surface water caused by waves, wind or storm will not in any way affect the said tanks. The platform 12 will be preferably of such weight as to carry the units downwardly to such a point that the normal surface level of the water will about reach the middle of the medial tanks 8, as is indicated in Fig. 1. The tanks 8 and 9 being of much smaller diameter than the lower tanks 7 will offer but comparatively slight wind and wave resistance so that there will be no tendency for the assembled structure to pitch and roll in the stormiest of weather, due to the stabilating effect exerted by the weighted lower tanks. Due to the springs 36 or other resilient means the air port when moored will be allowed to rise or fall with the tide so that the platform formed from the floorings 18 will always remain at approximately the same level relative to the top surface of the water. The air tanks 39 are situated at such a distance below the surface of the water that they will not interfere with ships traveling in the ocean and the said tanks will serve to support in a measure the weight of the various mooring cables 37.

The various units A may be either constructed on land and carried out to sea by specially constructed boats, one at a time, or if desired, the units may be built in mid ocean and assembled as completed.

In order that some idea of the relative sizes of the parts may be obtained it might be stated that the inventor contemplates maintaining his platform about 48 feet above the water level, making his lower tanks 7 about 96 feet in height, his middle tanks 8 about 48 feet in height and his upper tanks 9 about 24 feet in height. The ocean is about three miles deep at its deepest point, so that in situating the air port in midocean the cables 37 will be about 3¾ miles long, the weights 38 being situated outwardly from the sides of the platform about one mile in distance. The tide in mid-ocean, raises about 6 feet so that the springs 36 or other resilient means will be of such size as to vary in length approximately 6 feet. The weight of the various cables 37 will cause the same to sag at their central portions which will give an added resiliency to the cables. The sizes and dimensions of the various parts above given can be varied considerably to suit various conditions.

It will, of course, be understood that various changes and modifications may be made in the form, details, arrangement and proportions of the parts without departing from the scope of the present invention, which, generally stated, consists in the matter shown and described and set forth in the appended claims.

What is claimed is:

1. A sea air port comprising a platform and a plurality of sets of floats rigidly fixed thereto, each float comprising a series of superimposed air tanks of successively smaller size from bottom to top, and means for retaining the lowermost tanks at such a depth below sea level that the same will not be affected by wind, waves or storm and will maintain said platform in stable equilibrium.

2. A sea air port comprising a platform and a plurality of sets of floats rigidly fixed thereto, each set of floats comprising an upper air tank of comparatively small surface area adapted to rest adjacent the sea level and a lower air tank connected to said upper tank and of comparatively great surface area and weighted at its bottom to retain the same at a depth below sea level sufficient to be unaffected by surface water conditions to maintain said platform in stable equilibrium.

3. A sea air port comprising a continuous platform situated above the highest water level and formed from a plurality of float units, each unit comprising a large air tank weighted at its lower end and situated at such a depth in the sea as to be unaffected by surface waves or winds and graduatingly smaller air tanks situated above said large

tank, the uppermost of said tanks supporting a small unit section of the platform.

4. A sea air port comprising a structure formed from a plurality of separable units, secured together, each unit comprising a series of superimposed air tanks of successively smaller size from bottom to top, a ballast in the lower end of the bottom tank and a flooring carried at the top of the uppermost tank, whereby the lowermost tank will be maintained below sea level at such a depth as to be unaffected by surface water conditions.

5. A sea air port comprising a platform supported by floats to extend a considerable distance above the highest possible water level, resilient means connected to the outer sides of said structure, weights resting on the sea floor and cables secured to and extending between said resilient means and said weights, said resilient means being adapted to stretch to permit a variance of height of said platform to permit said platform to remain at approximately the same height from the water line irrespective of tide or storm.

6. A sea air port comprising a plurality of float units, each unit comprising a flooring, a series of air tanks supporting said flooring, said tanks being of successively smaller size from bottom to top, means for assembling adjacent units together to match said floorings and form a flat air craft landing platform and means for anchoring said platform.

7. The structure defined in claim 6, and means on each of said units for automatic engagement with successive units to form a rigid structure as said units are brought together.

8. A sea air port comprising a plurality of float units, each unit comprising a flooring of regular polygonal shape and a series of air tanks supporting said flooring, said air tanks being of successively smaller sizes from bottom too top, means operative from said floorings for pulling adjacent units together to match said floorings, and provide a large smooth surfaced air craft landing platform, and means for mooring the assembled structure to the sea floor.

9. A sea air port comprising a plurality of float units, each unit comprising a flooring of regular polygonal shape and a series of air tanks supporting said flooring, said air tanks being of successively smaller sizes from bottom to top, means for coupling adjacent units together to form a rigid structure and to aline said floorings to form a large smooth surfaced air craft landing platform, and means for mooring the assembled structure to the sea floor.

10. A sea air port comprising a plurality of float units, each unit comprising a flooring of regular polygonal shape and a series of air tanks supporting said flooring, said air tanks being of successively smaller sizes from bottom to top, means operative from said floorings for pulling adjacent units together, and means automatically coupling said units together as pulled to aline said floorings and provide a large smooth faced air craft landing platform, and means for mooring the assembled structure to the sea floor.

11. The structure defined in claim 10, and means operative from said platform for uncoupling said units.

In testimony whereof I affix my signature.

GUSTAVE M. SACHS.

Oct. 7, 1924. 1,511,153

E. R. ARMSTRONG

SEA STATION

Filed Nov. 7, 1922 2 Sheets-Sheet 1

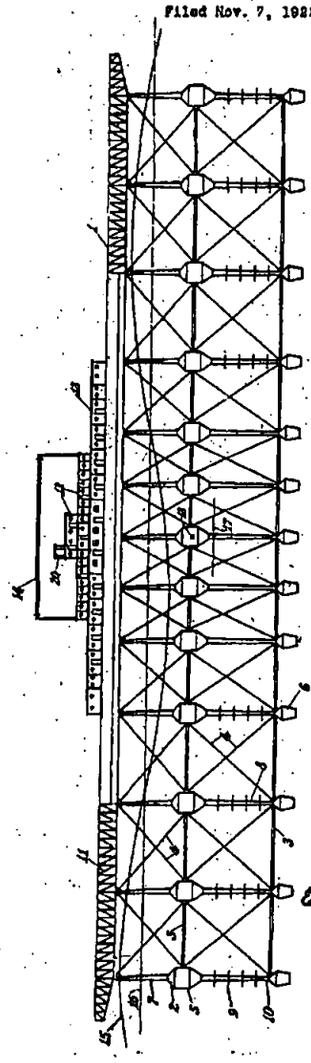

Fig. 1

Edward R. Armstrong
Inventor

Oct. 7, 1924. 1,511,163

E. R. ARMSTRONG

SEA STATION

Filed Nov. 7, 1922 2 Sheets-Sheet 1

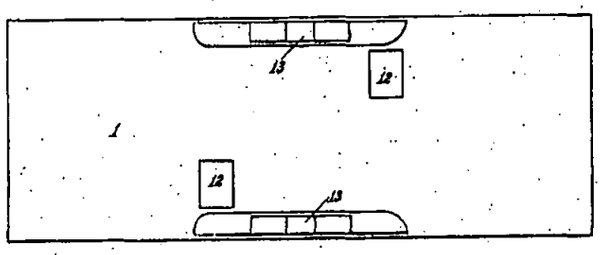

Fig. 2

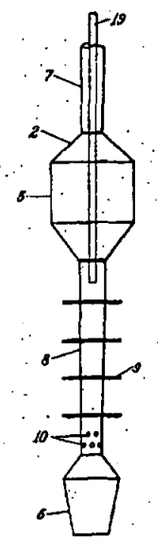

Fig. 4

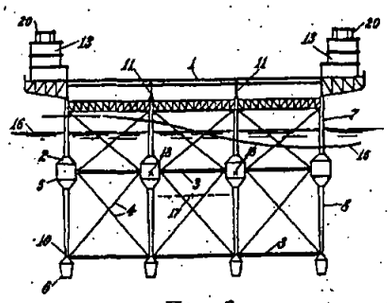

Fig. 3

Edward R. Armstrong
Inventor

Patented Oct. 7, 1924. 1,511,153

UNITED STATES PATENT OFFICE.

EDWARD R. ARMSTRONG, OF PHILADELPHIA, PENNSYLVANIA.

SEA STATION.

Application filed November 7, 1923. Serial No. 669,544.

To all whom it may concern:

Be it known that I, EDWARD R. ARMSTRONG, a citizen of the Dominion of Canada, and a resident of Philadelphia, in the county of Philadelphia, State of Pennsylvania, have invented a certain new and useful Sea Station, of which the following is a specification.

This invention relates to sea stations or floating docks primarily intended to be used as aeroplane supply and navigating stations as disclosed in my U. S. Patent #1,378,894 granted May 17, 1921.

Commercial transportation by aeroplane over wide expanses of water, such as the Atlantic Ocean between New York and London, is practical only by the use of supply stations located at desirable intervals along the route, at which stations the fuel supply can be replenished and the many details of operation of such an airway properly conducted. But to those acquainted with the roughness of the ocean under storm conditions it is obvious how hazardous it would be to attempt to alight on the ocean near one of these stations during a storm in even the largest flying boat or hydro aeroplane, while taking off from the ocean under these conditions would be impossible. It is thus necessary for the continuous operation of an ocean airway using anchored aeroplane supply and navigating stations to so construct and control them that aeroplanes can land directly on them and take off from the same, and do so irrespective of weather conditions and the turbulence of the ocean.

It is the principal object of the present invention to provide for the landing on and the operation of aircraft from, such sea stations with safety under all weather conditions. To these ends, and also to improve generally on sea stations and methods of fixing the positions of the same the invention consists in the various matters hereinafter described and claimed.

To accomplish these objects I so design and construct a floating dock or sea station that the wind and waves have practically no effect on it, the result whereof is that the upper, or landing and take off deck, of the station will be steady and almost without movement at all times, even under storm conditions which would make the largest of the ocean going vessels roll and pitch to a dangerous extent.

In the carrying out of my invention, I, taking advantage of the fact that the wind waves of ocean storms are relatively only surface disturbances of the ocean (the greatest waves on record rarely creating any but the slightest movement at a depth of fifty feet below normal sea level) so design and construct the sea station that practically all its effective displacement is below the disturbance line of the maximum wave. By reason of this, it is subject to the action of the waves to a minor extent only, and so remains practically undisturbed in even the most furious storms.

A floating dock or sea station suitable for a landing platform for aeroplanes, should be of considerable extent, an effective size being 1200 feet long and 400 feet wide. To those skilled in the marine art it is apparent how difficult, not to say impossible, it would be to build a ship or floating dock of the usual type of the size indicated. According to my invention, the design of my sea station or floating dock is such that it is feasible to make one not only of the size mentioned but even, if necessary, of double the size.

For the purpose of illustrating my invention, but not restricting it thereto, I show in the accompanying drawings one embodiment thereof. In these drawings:—

Fig. 1, is a side elevation showing a sea-station embodying the invention, the illustrated station being equipped with housing facilities for crew and supplies,

Fig. 2, is a plan view showing the top of the station and landing platform illustrated in Fig. 1,

Fig. 3, is a cross section of the sea station taken about at the centre of same, and

Fig. 4, is an enlarged view of one of the displacement members or floats showing the method of displacement control.

Referring now to the drawings, the landing deck 1 of the sea station is supported on hollow buoylike displacement members 2, preferably of uniform size, spaced according to the deck load concentration as particular circumstances may dictate and connected to each other by spacing struts 3 and cross-ties 4. In accordance with the invention, the displacement members 2 are so designed that approximately 95 percent of their displacement is below the wave disturbance line.

carried by the float above the same, means for connecting the float and platform, a weighty means below the float, means for connecting the weighty means and float, said elements being so related as to weight and proportions as to place said float below the disturbance line of the maximum wave and the centre of gravity of the floating dock below the centre of buoyancy of same, and means for admitting the buoying liquid to or ejecting from the said means connecting weighty means and float.

5. In a floating dock, a float, a platform carried by the float above the same, means for connecting the float and platform, a weighty means below the float, means for connecting the weighty means and float, said elements being so related as to weight and proportions as to place said float below the disturbance line of the maximum wave and the centre of gravity of the floating dock below the centre of buoyancy of same, and said first named means being shaped to present but small surface to the waves, and said means for connecting weighty means and float provided with resistance members.

In testimony whereof I affix my signature.

EDWARD R. ARMSTRONG.

For economy of construction the displacement members are divided into two main sections which I have designated as the load carrying section 5 and the stabilizing section 6. The portion 7 projecting from section 5 to the deck of the sea station may be cylindrical and is dimensioned primarily for strength rather than displacement. To offer effective resistance to vertical movement of displacement members 2 through the water the preferably cylindrical part 8, connecting with load carrying section 6 is provided with circular collars 9. Discharge openings 10 are provided at the base of the various sections 8 to allow the inlet and discharge of water from them as may be required to decrease or increase the displacement of the sea station as a whole, thereby to maintain the normal waterline 16 of the same practically constant despite variation in the live load to be supported by the dock when operating as an anchored aeroplane supply and navigating sea station.

To give statical stability to the sea station, stabilizing sections 6 are loaded with a suitable material, such as concrete, so that the centre of gravity 17 of the dock as a unit will be below the unit centre of buoyancy 18 of the displacement members 2, which centre of displacement is primarily determined by the size of load supporting section 5 and this in turn determined by the distributed deck load each displacement member 2 has to carry. The landing deck 1 is built up of structural steel trusses 11 which are so proportioned and spaced in the central sections that adequate storage and repair space is available for aeroplanes and the many other items incidental to the operation of such a dock as an aeroplane supply and navigating station.

For convenience in receiving and dispatching aeroplanes deck elevators 12 are provided so as to quickly clear the decks for arriving and departing planes. Living quarters, shops and storehouses 13 are located on top of the flying deck and at the extreme edges of the same so as to give the maximum clearance between them for the operation of the arriving and departing aeroplanes. For the regulation and operation of the airway the wireless aerial 14 is provided.

To illustrate the maximum rolling and pitching forces that the sea station might be subjected to the approximate contour 15 of a wave fifty feet high and eight hundred feet long is shown. The action of a wave of this size on the dock structure of the sea station is effective only against section 7 of displacement members 2, which force is so small as compared with the resistance and inertia of sections 5, 6 and 8 and resistance collars 9 of the displacement members as to be practically negligible as a disturbing force within the relatively short period of the passing wave which for the size given would be about eight seconds.

In order that the displacement of the members 2 may be varied at will, thereby to provide for variations in the live load on the dock while maintaining the same approximate water line 16, the section 8, of displacement members 2 are provided at their upper ends with a compressed air connection 19. By means of this connection compressed air at desired pressure, controlled by any suitable means, (not shown) from navigating quarters 20, or other suitable point, can be admitted and the pressure so regulated as to expel or admit, through the ports 10 the amount of water necessary to maintain the sea station at its normal water line 16 under varying conditions of the live load in a similar manner to that now used in standard floating docks. A differential control of the air pressure in sections 8 between the end and side displacement members is desirably used to obtain the proper trim of the dock longitudinally and laterally to compensate, if necessary, for uneven distribution of the live load on the landing deck.

I claim:—

1. In a floating dock, a float, a platform carried by the float above the same, means for connecting the float and platform, a weighty means below the float, means for connecting the weighty means and float, said elements being so related as to weight and proportions as to place said float below the disturbance line of the maximum wave and the centre of gravity of the floating dock below the centre of buoyancy of same.

2. In a floating dock, a float, a platform carried by the float above the same, means for connecting the float and platform, a weighty means below the float, means for connecting the weighty means and float, said elements being so related as to weight and proportions as to place said float below the disturbance line of the maximum wave and the centre of gravity of the floating dock below the centre of buoyancy of same, and said first named means being shaped to present but small surface to the waves.

3. In a floating dock, a float, a platform carried by the float above the same, means for connecting the float and platform, a weighty means below the float, means for connecting the weighty means and float, said elements being so related as to weight and proportions as to place said float below the disturbance line of the maximum wave and the centre of gravity of the floating dock below the centre of buoyancy of same, and said means for connecting weighty means and float provided with resistance members.

4. In a floating dock, a float, a platform

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

No. 08-076131- -00000-0000

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Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 411 PRESENTACION Folios: 69

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REQUISITOS MINIMOS PARA ADMISION A TRAMITE PCT

PATENTE DE INVENCION [X] MODELO DE UTILIDAD [ ]

- Indicación de que se solicita la concesión de una patente [X]
- Datos de identificación del solicitante o de la persona que presenta la solicitud [X]
- Descripción de la invención [X]
- Dibujos de ser estos pertinentes [X]
- Comprobante de pago de las tasas establecidas [X]

COMPLETA [X] INCOMPLETA [ ]

DISEÑO INDUSTRIAL [ ]

- Indicación de que se solicita el registro de Diseño Industrial [ ]
- Datos de identificación del solicitante o de la persona que presenta la solicitud [ ]
- Representación gráfica y fotográfica del Diseño Industrial o muestra del material que incorpora el diseño [ ]
- Comprobante de pago de las tasas establecidas [ ]

COMPLETA [ ] INCOMPLETA [ ]

ESQUEMA DE TRAZADO [ ]

- Indicación de que se solicita el registro de un Esquema de Trazado [ ]
- Datos de identificación del solicitante o de la persona que presenta la solicitud [ ]
- Representación gráfica del esquema trazado [ ]
- Comprobante de pago de las tasas establecidas [ ]

COMPLETA [ ] INCOMPLETA [ ]

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Firma Responsable

Fecha 23-07-08

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REPUBLICA DE COLOMBIA
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

Bogotá,
2020

Doctor(a)
RODRIGUEZ D` ALEMAN DILIA MARIA

REFERENCIA	Radicación No.	8 76131
	Solicitud internacional	PCT/TR2006/000072
	Fecha inicio fase nacional	23/07/2008
	Trámite	11
	Evento	378
	Actuación	430
	Oficio No.	- 10880

Como resultado del examen de forma, realizado con fundamento en el artículo 38 de la Decisión 486 de la Comisión de la Comunidad Andina, artículo 27 del Tratado de Cooperación en Materia de Patentes (PCT), regla 51 bis del Reglamento y Circular Única de la Superintendencia de Industria y Comercio, se le comunica que:

1. La solicitud no contiene el poder debidamente otorgado, con el lleno de los requisitos exigidos por los artículos 63 y subsiguientes del Código de Procedimiento Civil. Adicionalmente, deberá presentar el documento que acredita la existencia y representación legal de la sociedad solicitante, cuando ésta fuere persona jurídica.

En cumplimiento de lo dispuesto por el artículo 39 de la Decisión 486, se le requiere para que dentro del término de dos meses siguientes a la fecha de notificación del presente oficio, complete los requisitos anteriormente enunciados. En caso de no dar cumplimiento al presente requerimiento, la solicitud se considerará abandonada y perderá su prelación.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Unica No.10 de 2001.

ALIX CARMENZA CESPEDES DE VERGEL
Jefe de la división de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista de fecha 29 AGO. 2008
jfernand