

PATENT SPECIFICATION

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DRAWINGS ATTACHED.

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COMPLETE SPECIFICATION.

Anchor, Especially for Moorings and for Fixed Moorings with Two Anchors Placed at an Angle.

We, COOPERATIVA METALLURGICA ING. G. TOMMASI, an Italian Body Corporate, of Cantiere Navale, Molo Sud, Ancona, Italy, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to an anchor, especially for moorings and for fixed moorings with two anchors placed at an angle.

At present, for the purposes abovementioned, anchors of the conventional type are used - i.e. marine anchors with articulated flukes, anchors of the Admiralty type, and so on, which are obtained by a casting process and are suitably adapted.

However, these applications give unsatisfactory results, either as regards their hold, or as regards the weight/hold ratio, or even as regards their stability; and, finally, their structure - being essentially that of marine anchors - does not adapt itself well to the different types of sea-beds or river-beds. These deficiencies become particularly apparent, for example, in installations for the loading and unloading of petrol tanker ships at sea - where installations giving the possibility of mooring with two anchors placed at an angle, and which are easily constructed at an economically acceptable cost are required.

The aim of the present invention is to permit the construction of an anchor specially conceived for moorings and for fixed moorings with two anchors placed at an angle. This anchor is realized in the form of a vertical welded steel plate which is provided with two fixed flukes inclined at approxi-

mately 45° in relation to the vertical plate, the said plate being profiled so as to penetrate easily into the sea or river bed, providing an ample holding surface even in soft beds, and ensuring great transversal stability, together with a high resistance to dragging. By a vertical plate in this specification is meant a member which has a plate-like form, that is, has front and rear rectilinear surfaces in parallel planes which are substantially vertical when the anchor is in normal use, the distance between the surfaces being much smaller than their length or breadth.

Another aim is to achieve by the use of a shank with two branches, and with the co-operation of a pair of brackets or stay-plates which serve the purpose of reinforcement and stabilization, the occurrence of torque or rocking phenomena in the anchor, in the case of normal dragging at the axis of the shank and in the horizontal plane.

Another aim is to facilitate the embedding of the anchor by further increasing the resistance to dragging, by means of a terminal plate or counter-fluke which forms an embedding plate.

Another aim is to realize an anchor of this type in a form in which the large plate is vertical, and the flukes and the branches of the shank are hollow, so that adjustment of the weight of the anchor can take place, by using filler materials (concrete, iron, and so on), to adapt the said anchor to the varying conditions of use.

Other aims and advantages will be apparent from the ensuing description, and from the accompanying drawing, which illustrates diagrammatically, and by way of example only, an embodiment of the invention.

[Price 4s. 6d.]

Figure 1 is a profile view of the anchor of the invention;

Figure 2 is a frontal view;

Figure 3 is a plan view of the anchor.

5 The anchor consists of a large vertical plate 1 which is hollow at 2 and whose lower part or foot is provided with an embedment-plate 3 or counter-fluke.

10 On the plate 1 are mounted two hollow flukes 6 which, viewed from the side, have an inclination of about 45° in relation to the vertical axis of the plate, as can be seen from Figure 1, and whose surface is adapted in such a way as to favour the embedding of the anchor and the ensuring of its hold.

15 On the same face of the plate 1 are welded two arms 7 which converge and unite at a predetermined distance from the plate, and which constitute the shank 8, with attachment means 9, 10, for the chain; the said arms may be hollow, and are adapted to be filled, for the purpose of a possible increasing of the weight, as is provided for in the case of the plate 1 and of the flukes 6.

25 At the side of each arm 7 of the shank 8, and between the said arms and the plate 1, there is furthermore provided a triangularly-shaped bracket or stay-plate 5, for purposes of reinforcement. This pair of brackets or stay-plates likewise exerts a precise stabilizing and antirotational effect on the anchor.

30 All the abovementioned parts are made of steel and are assembled together by means of appropriate welds.

35 Particularly important parts are the hollow portions 2, which are intended to be entirely or partially filled with materials which serve to increase the weight of the anchor, when it is suitable to increase the weight thereof with reference to particular conditions of use. It is also possible to construct, in this manner, anchors which have a large holding surface and a reduced weight and which are particularly suitable for sea or river bottoms which are muddy and in a very fluid state.

45 A series of repeated tests, comparisons, and experiments has shown that the particular characteristics of this anchor have conferred upon it a holding-power of such a nature that it is able to do the work of an anchor of the conventional type weighing about four times as much. Likewise, as regards the

equilibrium, this is easily maintained up to the point where there is an inclination of the shank by approximately 6° in relation to the plane of the sea- or river-bed, whereas with conventional anchors, the maximum permitted inclination is 3° . 55

WHAT WE CLAIM IS:-

1. An anchor, especially for moorings 60 and for fixed moorings with two anchors placed at an angle, characterized in that the said anchor is composed essentially of a vertical plate which carries a pair of flukes which are inclined at an angle of approximately 45° in relation to the plane of the said plate; a pair of converging horizontal arms which are secured to the plate and extend to join at a predetermined distance from the plate, constituting the shank; a pair of 65 antirotational brackets or stay-plates which are provided between the arms and the plate for purposes of reinforcement and stabilization; and an embedding-plate constituted by a projecting portion on the lower part or foot of the said vertical plate. 70

2. An anchor as claimed in claim 1, characterised in that the said flukes, the said arms, the said brackets or stay-plates, which are provided for purposes of reinforcement and stabilization, and the said embedding-plate, are fixed and assembled to the main vertical plate by means of welding. 75

3. An anchor as claimed in claim 1 or 2, characterised in that one or several of the constituent elements of the anchor - more particularly, the vertical plate, the flukes, and the arms of the shank - are hollow and are adapted to contain materials to increase the weight of the anchor. 80

4. An anchor as claimed in any one of the preceding claims, characterised in that the flukes have a surface which has been adapted to facilitate the embedding of the anchor in the sea- or river-bed and to increase the resistance to dragging. 85

5. An anchor substantially as described above and in accordance with the accompanying drawing. 90

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Agents for the Applicants.



Figure 1 is a profile view of the anchor of the invention;

Figure 2 is a frontal view;

Figure 3 is a plan view of the anchor.

5 The anchor consists of a large vertical plate 1 which is hollow at 2 and whose lower part or foot is provided with an embedment-plate 3 or counter-fluke.

10 On the plate 1 are mounted two hollow flukes 6 which, viewed from the side, have an inclination of about 45° in relation to the vertical axis of the plate, as can be seen from Figure 1, and whose surface is adapted in such a way as to favour the embedding of the anchor and the ensuring of its hold.

15 On the same face of the plate 1 are welded two arms 7 which converge and unite at a predetermined distance from the plate, and which constitute the shank 8, with attachment means 9, 10, for the chain; the said arms may be hollow, and are adapted to be filled, for the purpose of a possible increasing of the weight, as is provided for in the case of the plate 1 and of the flukes 6.

25 At the side of each arm 7 of the shank 8, and between the said arms and the plate 1, there is furthermore provided a triangularly-shaped bracket or stay-plate 5, for purposes of reinforcement. This pair of brackets or stay-plates likewise exerts a precise stabilizing and antirotational effect on the anchor.

30 All the abovementioned parts are made of steel and are assembled together by means of appropriate welds.

35 Particularly important parts are the hollow portions 2, which are intended to be entirely or partially filled with materials which serve to increase the weight of the anchor, when it is suitable to increase the weight thereof with reference to particular conditions of use. It is also possible to construct, in this manner, anchors which have a large holding surface and a reduced weight and which are particularly suitable for sea or river bottoms which are muddy and in a very fluid state.

45 A series of repeated tests, comparisons, and experiments has shown that the particular characteristics of this anchor have conferred upon it a holding-power of such a nature that it is able to do the work of an anchor of the conventional type weighing about four times as much. Likewise, as regards the

equilibrium, this is easily maintained up to the point where there is an inclination of the shank by approximately 6° in relation to the plane of the sea- or river-bed, whereas with conventional anchors, the maximum permitted inclination is 3° .

WHAT WE CLAIM IS:-

60 1. An anchor, especially for moorings and for fixed moorings with two anchors placed at an angle, characterized in that the said anchor is composed essentially of a vertical plate which carries a pair of flukes which are inclined at an angle of approximately 45° in relation to the plane of the said plate; a pair of converging horizontal arms which are secured to the plate and extend to join at a predetermined distance from the plate, constituting the shank; a pair of antirotational brackets or stay-plates which are provided between the arms and the plate for purposes of reinforcement and stabilization; and an embedding-plate constituted by a projecting portion on the lower part or foot of the said vertical plate.

2. An anchor as claimed in claim 1, characterized in that the said flukes, the said arms, the said brackets or stay-plates, which are provided for purposes of reinforcement and stabilization, and the said embedding-plate, are fixed and assembled to the main vertical plate by means of welding.

3. An anchor as claimed in claim 1 or 2, characterized in that one or several of the constituent elements of the anchor - more particularly, the vertical plate, the flukes, and the arms of the shank - are hollow and are adapted to contain materials to increase the weight of the anchor.

4. An anchor as claimed in any one of the preceding claims, characterized in that the flukes have a surface which has been adapted to facilitate the embedding of the anchor in the sea- or river-bed and to increase the resistance to dragging.

5. An anchor substantially as described above and in accordance with the accompanying drawing.

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