52-163

No. 835,223. PATENTED NOV. 6, 1906.

F. B. LANGSTON.

ANCHOR.

APPLICATION FILED OCT. 13, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

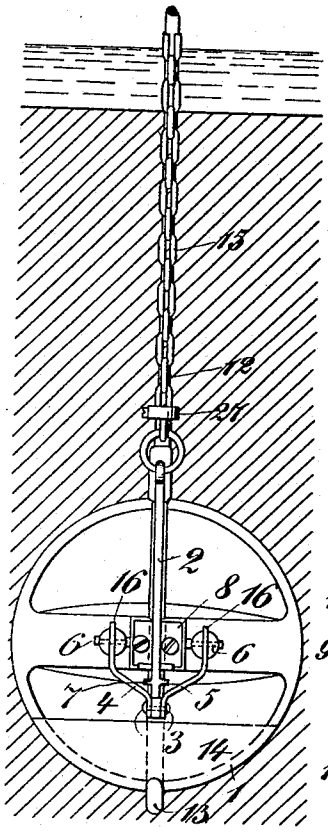


Fig. 2.

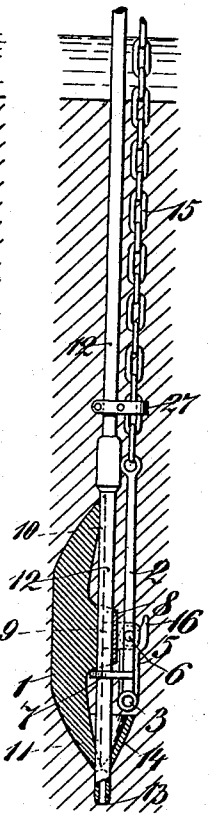
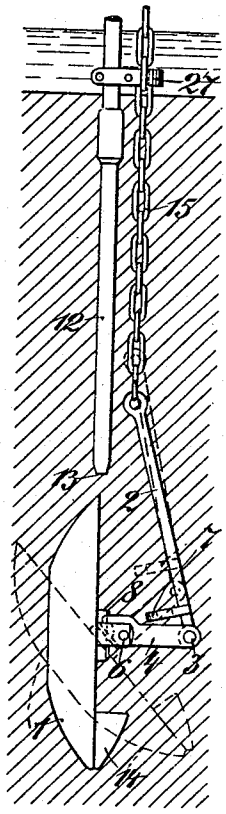


Fig. 3.



1285

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Fig. 4.

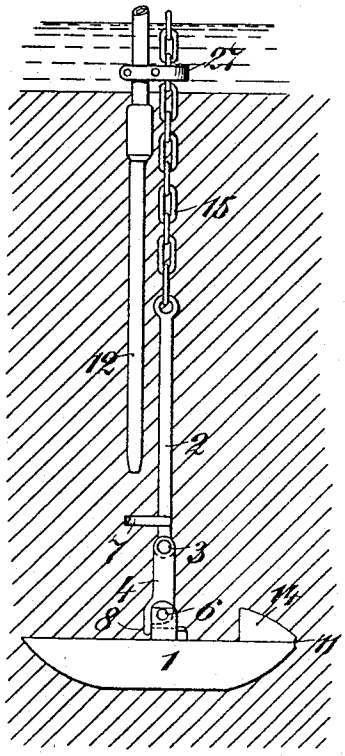


Fig. 7.

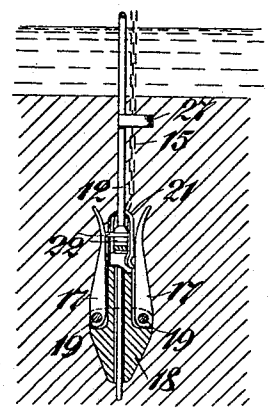
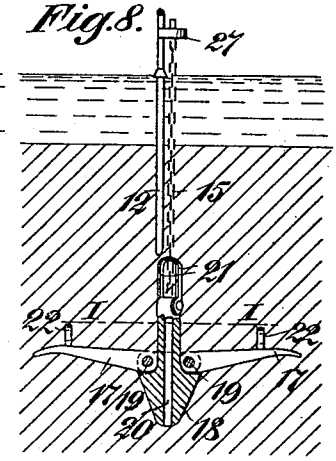


Fig. 8.



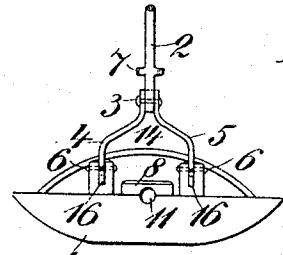
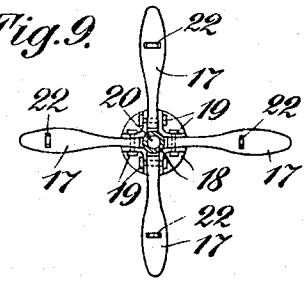


Fig. 5.

Fig. 9.



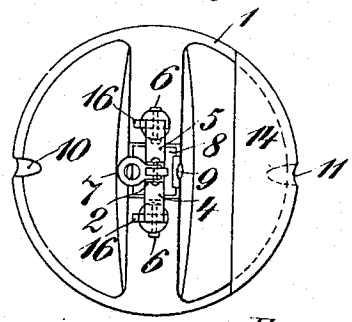


Fig. 6.

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Fig. 10.

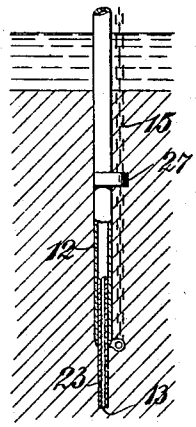


Fig. 11.

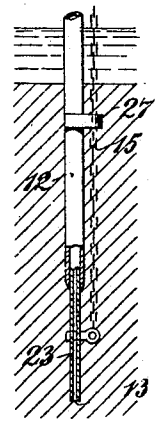


Fig. 12.

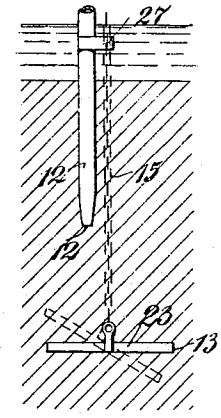


Fig. 13.

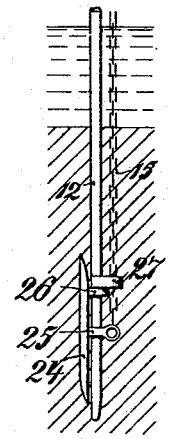
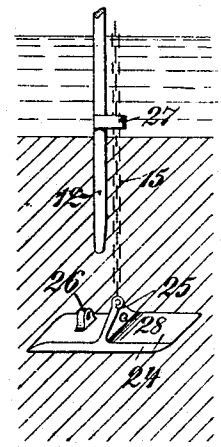


Fig. 14.



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No. 835,223. Specification of Letters Patent. Patented Nov. 6, 1906.

Application filed October 13, 1904. Serial No. 228,300.

To all whom it may concern:

Be it known that I, FREDERICK BOWMAN LANGSTON, engineer, residing at Brooklyn, New York, have invented certain new and useful Improvements Relating to Anchors, of which the following is a specification.

This invention has for its object anchoring devices in which the seizing device is sunk, owing to the fact that the ground is softened or loosened beneath it by fluid under pressure in such a manner that the seizing device is able to sink into the subsoil owing to its own weight.

In accordance with this invention the seizing device is held in such a position during sinking that it penetrates the ground with but little resistance and that after it has entered the ground it is released and reversed in such a manner as to oppose great resistance to withdrawal. An important feature is that the seizing device may be constructed with a disk or mushroom shaped seizing member, by which means special advantages are secured in the operation and construction of the anchoring device. A further important point is that the pipe for the fluid under pressure is able to serve as means for locking the seizing device in the position required for the sinking of the anchor.

In the accompanying drawings, Figures 1 to 6 represent a constructional form of anchor, viz: Fig. 1 is a face view of the improvement in a non-resisting position in the bed of the waterway. Fig. 2 is a transverse section of the same. Fig. 3 is a corresponding side elevation after the locking device has been released and the reversal has commenced. Fig. 4 is a similar side elevation when reversal into the open or resisting position has taken place. Fig. 5 is a front elevation corresponding to Fig. 4. Fig. 6 is a plan view of Fig. 4. Figs. 7, 8, and 9 show a further constructional form of the anchoring device, viz: Fig. 7 is a sectional front elevation of the improvement in a closed non-resisting position. Fig. 8 is a like view of the same in an open or resisting position. Fig. 9 is a sectional plan view of the same on the line 1 1 of Fig. 8. Figs. 10–12 represent a third constructional form of the anchor, viz: Figs. 10 and 11 show the anchor in the position for sinking, and Fig. 12 shows the same in the locked position. Figs. 13 and 14 represent a fourth constructional form of the armature in both positions.

In the anchoring device represented in Figs. 1–6 the seizing or holding member 1 is of disk or mushroom like formation. This anchoring-member is held in the same direction as the bar of the anchor-chain during the sinking process. In the holding position the seizing member lies transversely of the anchor-chain. (See Fig. 4.) The anchor-chain bar 2 is connected with the two lever-arms 4 and 5 by means of a bolt 3 upon its lower end, the other extremities of these arms being rotatably connected, by means of the joints 6 6, with the flat-shaped seizing member 1.

An eye 7 is provided on the anchor-chain bar 2. Between the two joints 6 6 a small plate 8 is fixed upon the seizing member 1, at about the center of this latter, by means of screws. Between this plate 8 and the seizing member 1, Fig. 6, an opening 9 is provided for the passage of the pipe 12 for the fluid under pressure. In addition to this there is provided upon the edge of the seizing member 1, in the direction of the axis of the guide-opening 9, upon the one side the recess 10 and upon the other side the opening 11. As the pipe 12 for the fluid under pressure is carried through these guides or openings 9, 10, and 11 and through the eye 7 on the anchor-chain bar 2 the seizing member 1 is held parallel with or in the same direction as the anchor-chain bar 2, Fig. 2. In this position, Fig. 2, the eye 7 is situated between the two openings 9 and 11, the arms 4 and 5 being applied upon the seizing member 1. Owing to the fact that the pipe 12 for the fluid under pressure also passes through the eye 7 in the position shown in Fig. 2, the arms 4 5 are bolted to the seizing member 1. The pipe 12 for the fluid under pressure then projects below, with its mouth 13 below the seizing member.

In the constructional form here represented a cap or shield 14 is also provided upon the seizing member and during the sinking of the seizing member protects the lower extremity of the anchor-chain bar 2 and the lever and locking device from becoming foul and from injury at the same time. Owing to the pointing of the seizing member 1, it facilitates its penetration, and owing to the resistance produced by the pull on the anchor-chain in the ground it facilitates the reversal of the seizing member.

Sinking of the anchoring device is produced with the parts occupying the position represented in Fig. 2, fluid under pressure

being forced through the pipe 12 under the seizing member 1. By this means the ground below this latter is loosened, so that the seizing member 1 is able to sink under the influence of gravity. When the seizing member 1 has entered the ground to a sufficient depth, the pipe 12 for the fluid under pressure is raised in such a manner that it is withdrawn from the openings 9, 10, and 11. By this means the eye is released, so that the locking hitherto produced by the pipe 12 for the fluid under pressure is released. If tractive effort is then exerted upon the anchor-chain 15, the seizing member has a tendency to place itself transversely of the anchor-chain. This tendency is increased owing to the fact that the cap 14 offers resistance, but more particularly the upper edge of the seizing member.

Owing to the traction of the chain, the arms 4 5 are brought into the position represented in Fig. 3, which is limited by the stops 16. By this means the point of attack of the chain is removed by the length of the arms 4 5, and this in such a manner that the traction has a tendency to rotate the seizing body 1 as the arms 4 5 and the anchor-chain bar 2 tend to set themselves in the extended position represented in Fig. 4. The resistance of the protecting-cap 14 and the upper edge of the seizing member coöperate in this action. This resistance forms a couple with the tractive effort acting on the chain and effectively starts and assists the transverse placing of the seizing member 1.

For the purpose of facilitating the manipulation of the anchoring device the conduit for the fluid under pressure and the chain 15 might be connected by means of guides. To this end eyes 27 are shown in the drawings on the pipe 12, and through these eyes the chain 15 is pssead.

In the constructional form represented in Figs. 7–9 the anchor member is provided with any number of arms 17, grouped in the form of a star. During the sinking of the anchoring device these arms are set in the same direction as the pipe for the fluid under pressure—that is to say, as the axis of the anchor member 18, upon which they are rotatably mounted upon the pins 19. When pull is exerted upon the anchor-chain after withdrawal of the pipe, the pressure of the earth produces the displacement of the locking-arms 17 into the transverse position. The anchor member 18 is also provided with a guide-passage 20, through which the pipe 12 for the fluid under pressure is passed. The anchor-body is suspended by means of a strap or shackle 21 from the anchor-chain 15. In this case also the pipe for the fluid under pressure forms a part of the locking device by means of which the locking-arms 17 are maintained in the closed position represented in Fig. 7. To this end the eyes 22 are provided upon the arms 17. These eyes 22 are arranged upon the arms 17 in reverse positions relatively to each other, so that in the closed condition of the anchoring device they lie, as shown in Fig. 7, one above the other. When the anchor sinks, the locking-arms 17 assume the position represented in Fig. 7, in which the pipe for the fluid under pressure extends below out of the anchor-body. When a sufficient depth of anchoring has been attained, the locking of the arms 17 is released by raising the pipe 12 for the fluid under pressure, whereupon the arms 17 fall outward into the position represented in Fig. 8. This displacement of the arms 17 is facilitated and assisted by the pull upon the anchor-chain. To the same end the arms are bent somewhat outward at the upper extremities, whereby when the anchor-body is pulled upon the pressure of the earth acts still more effectively for producing the reversal of the arms 17.

In the constructional form shown in Figs. 10–12 the seizing device 23 constitutes a prolongation of the pipe 12 for the fluid under pressure. The water under pressure here passes through the seizing member itself, owing to the tubular form of this latter. In this case the tubular seizing member may be inserted within the pipe 12 for the fluid under pressure, as shown in Figs. 10 and 11, or it may be passed outwardly over the mouth of this pipe. After the release of the pipe for the fluid under pressure from the seizing member 23 this latter assumes the position shown in Fig. 12, owing to the pull upon the anchor-chain.

In the constructional form shown in Figs. 13 and 14 the anchor member is formed like a quadrangular plate 24. This carries a transverse piece 25, to which the anchor-chain is attached. It is also provided with an eye 26. If the pipe 12 for the fluid under pressure is carried through this eye 26 and a corresponding opening 28 in the cross-piece 25, the seizing member is held locked edgewise, as shown in Fig. 13. After the withdrawal of the pipe 12 the reversal of the anchor-plate into the position represented in Fig. 14 takes place in the same manner as already described.

From the foregoing it will be understood that the constructional form of the anchor-body and of the seizing-body may vary widely. The important point in each case is that the seizing device of the anchor shall be so arranged during sinking that during this operation they offer the least possible resistance and that only after the sinking operation is completed do they pass into the holding or extended position, either automatically or by the release of the locking device or owing to the conditions brought about by the pull upon the anchor-chain. The locking of the seizing-body in the unextended or edgewise position may take place by means of the

pipe for the fluid under pressure, and the locking member or members may be of any desired form.

When the pipe for the fluid under pressure has been withdrawn and the locking device released, the fluid may also be employed for facilitating the alteration of the position of the anchoring-body. This may take place, for example, owing to the fact that the earth which stands in the way of change of position of the anchor-body is carried away by the water under pressure which is discharged by the fluid-pipe above the anchoring device.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. A mooring device comprising an anchor, a fluid-pressure driving-pipe and a locking device for holding the anchor on the said fluid-pressure driving-pipe in a non-resisting position while sinking it and to unlock the anchor after it is sunk to the desired depth in the bed of the waterway.

2. A mooring device comprising an anchor, a fluid-pressure driving-pipe, a locking device for holding the anchor on the said fluid-pressure driving-pipe in a non-resisting position while sinking it and to unlock the anchor after it is sunk to the desired depth in the bed of the waterway, and means for turning the anchor after being unlocked from a non-resisting position to a resisting position.

3. A mooring device comprising an anchor, an anchor-cable, a fluid-pressure driving member for the said anchor and on which the anchor is locked in a non-resisting position during the sinking of the anchor, the said fluid-pressure driving member on being withdrawn unlocking the anchor and the said cable on exerting a pull on the anchor after the latter is unlocked causing the anchor to pass into a resisting position.

4. A mooring device comprising an anchor, an anchor-chain, and a fluid-pressure pipe on which the said anchor is held in a non-resisting position during the sinking of the anchor, the said chain, on exerting a pull, causing the anchor to pass into a resisting position.

5. A mooring device comprising an anchor, an anchor-chain connected with the anchor, a fluid-pressure pipe, and means for locking the said anchor to the said pipe in a non-resisting position, the pipe, on being withdrawn, unlocking the anchor from the pipe, to allow of turning the anchor into a resisting position on exerting a pull on the said chain.

6. A mooring device comprising an anchor, an anchor-chain connected with the said anchor, and a fluid-pressure pipe engaging the said anchor across its face, to hold the anchor in a non-resisting position during the sinking of the anchor.

7. A mooring device comprising an anchor, an anchor-chain connected with the said anchor, and a fluid-pressure pipe engaging the said anchor across its face, to hold the anchor in a non-resisting position during the sinking of the anchor, the discharge end of the said fluid-pressure pipe extending through a hooked portion of the anchor.

8. A mooring device comprising an anchor, an anchor-chain connected with the said anchor, and a fluid-pressure pipe engaging the said anchor across its face, to hold the anchor in a non-resisting position during the sinking of the anchor, the discharge end of the said fluid-pressure pipe extending through a hooked portion of the anchor, the said anchor having its shank made in sections locked to the fluid-pressure pipe during the sinking of the anchor.

9. A mooring device comprising an anchor, an anchor-chain connected with the said anchor, and a fluid-pressure pipe engaging the said anchor across its face, to hold the anchor in a non-resisting position during the sinking of the anchor, the discharge end of the said fluid-pressure pipe extending through a hooked portion of the anchor, the said anchor having its shank made in sections locked to the fluid-pressure pipe during the sinking of the anchor, the sections being unlocked on withdrawal of the said pipe, to allow the sections to swing into an angular position, one relative to the other, for turning the anchor on exerting a pull on the said anchor-chain.

10. A mooring device comprising an anchor, an anchor-cable for the anchor, a fluid-pressure driving-pipe for the said anchor, and a connection between the said anchor and the said fluid-pressure driving-pipe to hold the anchor locked to the fluid-pressure driving-pipe in a non-resisting position and to allow withdrawal of the said fluid-pressure driving-pipe to unlock the anchor, the said cable on exerting a pull on the unlocked anchor causing the anchor to pass into a resisting position.

11. A mooring device provided with an anchor having a sectional shank, the sections being pivotally connected with each other, one of the sections being pivotally connected with the body of the anchor and held against movement in one direction relative to the said anchor-body, and an anchor-chain connected with the free end of the other shank-section.

12. A mooring device having an anchor of disk shape, and a hood extending over a portion of the anchor along the edge and face of the anchor.

13. A mooring device having an anchor of disk shape, a hood extending over a portion of the anchor along the edge and face of the anchor, and a driving member extending across the face of the said anchor and through an opening in the bottom of the hood at the edge of the anchor.

14. A mooring device having an anchor of disk shape, a hood extending over a portion

of the anchor along the edge and face of the anchor, and a driving member extending across the face of the said anchor and through an opening in the bottom of the hood at the edge of the anchor, the said member also passing through a recess in the edge of the anchor diametrically opposite the said opening.

15. A mooring device having an anchor of disk shape, a hood extending over a portion of the anchor along the edge and face of the anchor, and a driving member extending across the face of the said anchor and through an opening in the bottom of the hood at the edge of the anchor, the said member also passing through a bearing in the middle of the anchor.

16. A mooring device comprising an anchor having a disked body and a shank made in sections, one of the sections being pivotally connected with the said body, an anchor-chain connected with the other shank-section, a fluid-pressure pipe having a bearing on the face of the anchor-body, and an eye on the shank, engaging the said pipe, to hold the shank in a folded position on the pipe and to allow of freeing the shank on withdrawing the pipe.

In witness whereof I have hereunto signed my name, this 24th day of September, 1904, in the presence of two subscribing witnesses.

FREDERICK BOWMAN LANGSTON.

Witnesses:
HENRY HASPER,
WOLDEMAR HAUPT.