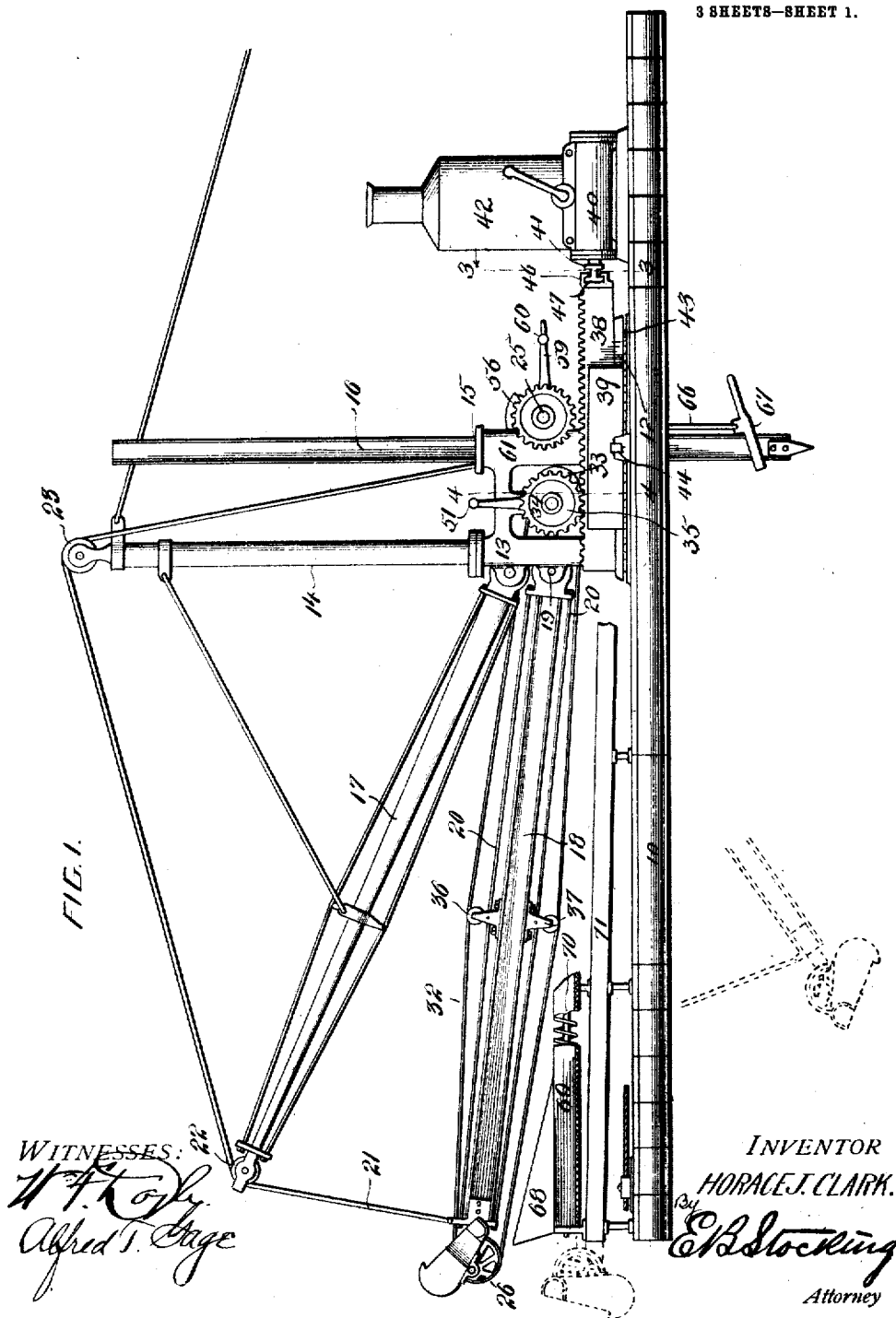


GOLD DREDGE.

909,063.

Patented Jan. 5, 1909.

3 SHEETS—SHEET 1.



H. J. CLARK.

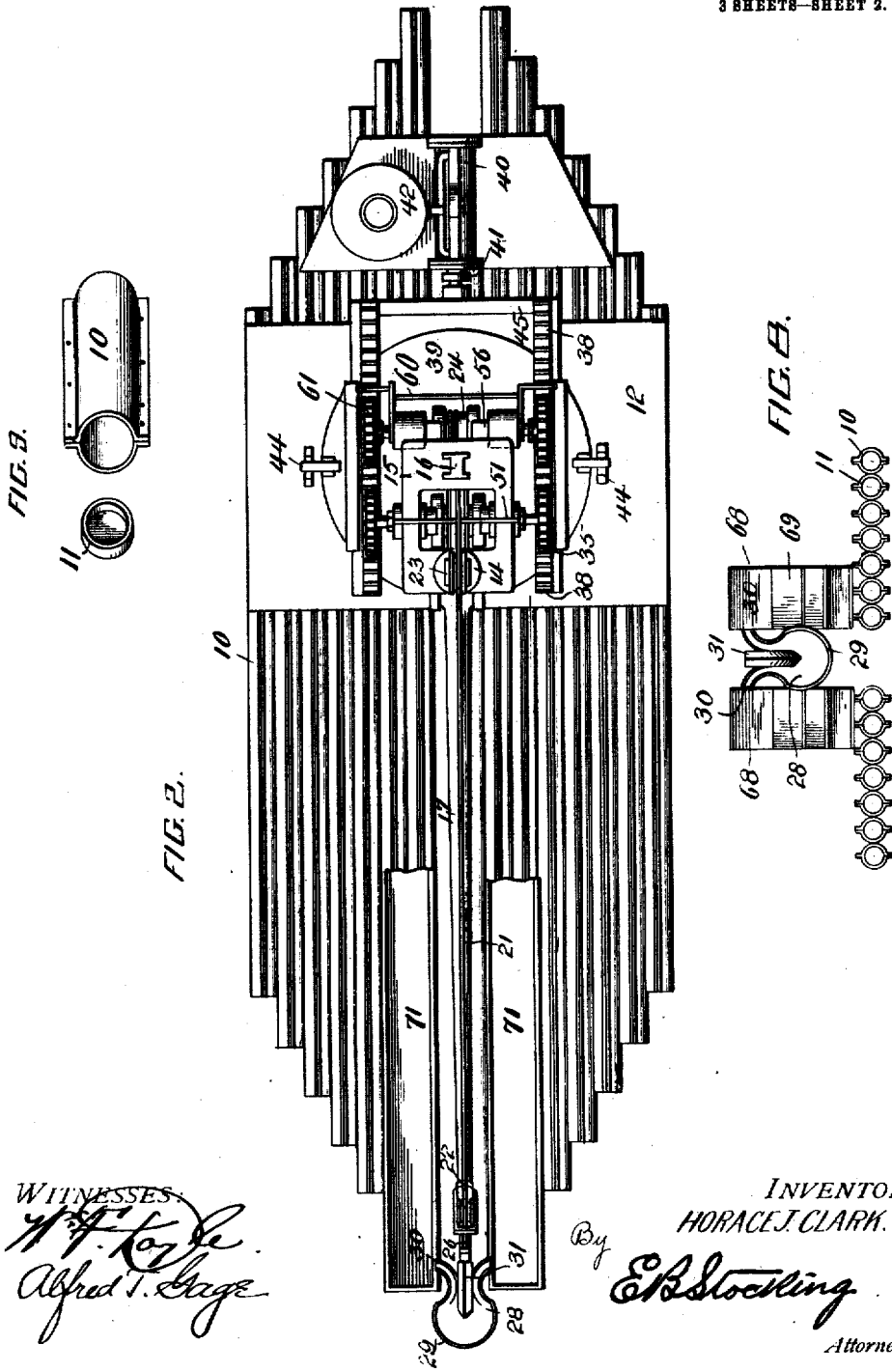
GOLD DREDGE.

APPLICATION FILED APR. 23, 1908.

909,063.

Patented Jan. 5, 1909.

3 SHEETS—SHEET 2.



909,063.

Patented Jan. 5, 1909.

3 SHEETS—SHEET 3.

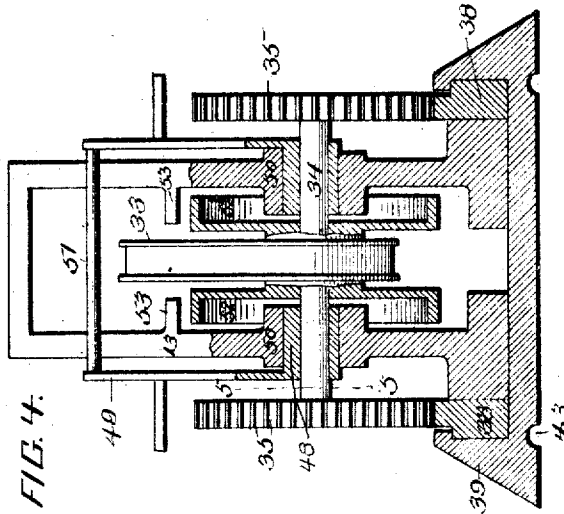


FIG. 4.

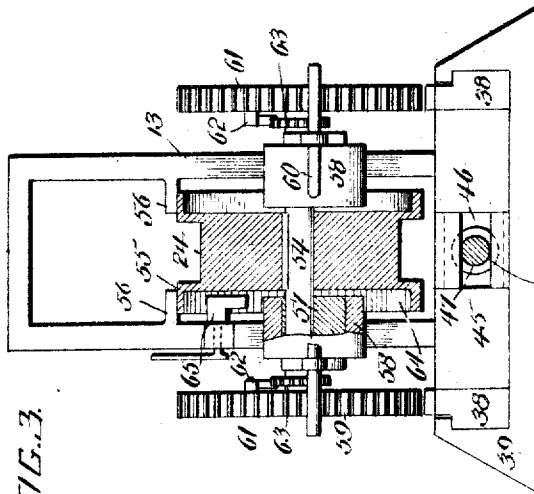


FIG. 3.

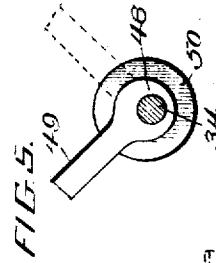


FIG. 5.

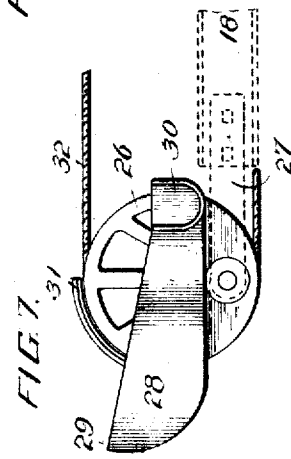


FIG. 7.

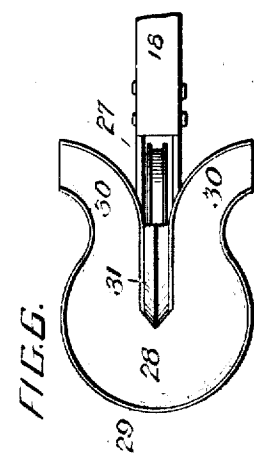


FIG. 6.

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GOLD-DREDGE.

No. 909,063.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed April 23, 1908. Serial No. 428,825.

To all whom it may concern:

Be it known that I, HORACE J. CLARK, citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have
5 invented certain new and useful Improvements in Gold-Dredges, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a gold dredge,
10 and particularly to a floating structure having a scoop oscillated upon the free end of an arm and adapted to carry material from the point dredged and deposit it upon the floating structure carrying the arm.

15 The invention has for an object to provide a novel and improved construction by which the dredging arm operates through a central channel in the float, and the scoop carried thereby is partially oscillated in its digging
20 action and this oscillation continued after the arm is raised so as to deliver from the scoop to a receptacle.

A further object of the invention is to provide a novel and improved structure of
25 scoop having discharge chutes at one portion thereof so that the contents thereof may flow by gravity into the receiving receptacle and this discharge be secured at opposite
30 sides of a wheel or lever controlling the oscillating action of the scoop.

Another object of the invention is to provide means for independently controlling the oscillation of the scoop and the raising and lowering of the arm by which it is carried,
35 together with means by which said arm may be rotated so, as to deliver at other points than upon the float carrying the dredging parts.

Other and further objects and advantages
40 of the invention will be hereinafter fully set forth and the novel features thereof defined by the appended claims.

In the drawing:—Figure 1 is an elevation showing the invention applied; Fig. 2 is a
45 plan thereof with the delivery screen omitted; Fig. 3 is an enlarged vertical section on line 3—3, Fig. 1; Fig. 4 is a similar view on line 4—4, Fig. 1; Fig. 5 is a detail section showing the eccentric sleeve on line 5—5,
50 Fig. 4; Fig. 6 is a plan of the scoop; Fig. 7 is a side elevation thereof, Fig. 8 is an end view of the float and scoop; Fig. 9 is a detail perspective showing the structure of float.

Like numerals refer to like parts in the several views of the drawings.

In the application of the invention any desired form of float or scow may be used for that purpose, but as showing a convenient form thereof I have illustrated it as formed
of tubes or pipes 10 disposed parallel to each other and provided with closing caps 11 at
60 each end by which they are rendered water tight and made properly buoyant to support the platform 12 containing the operative parts. This platform is adapted to support
65 the framework 13 from which the mast 14 extends vertically, and also a bearing 15 through which the anchoring spud 16 is projected, this being disposed at substantially the mid width of the float in order to permit
70 a swinging or oscillating movement of one end thereof. The framework is also provided with a pivotally mounted boom 17, and with a dredge arm 18 pivoted thereto at 19 and provided with suitable braces, as shown at 20, this arm being adapted to be raised and lowered by means of the cable 21 extending from the bearing pulley 22 at the end of the boom and thence over the bearing 23 to
80 a suitable winding drum 24 secured upon the shaft 25 which has a bearing in the frame. This arm is provided at its free end with an eccentrically disposed wheel or lever 26 pivotally mounted in bearings 27 extended from the dredge arm 18. Secured upon this
85 wheel to oscillate or rotate therewith is a scoop 28 preferably having a curved cutting edge 29 thus forming a partly round body from which at each side discharge chutes 30 extend laterally thereof upon a curved line
90 to facilitate the flow of material by gravity therethrough, and to discharge said material at substantially a right angle to the cutting edge of the scoop. This scoop is provided with a shield 31 intermediate of the chutes
95 and curved upward to embrace a portion of the wheel 26, as shown in Figs. 6 and 7.

For the purpose of partially rotating and oscillating the wheel or lever 26 the cable 32 extends therefrom and may, if desired be secured thereto, this cable passing to a similarly disposed wheel or lever 33 secured upon
100 the driving shaft 34 provided with driving gears 35 at one or both ends. This cable is guided for the length of the arm by suitable
105 rollers 36 mounted in brackets 37 secured thereon.

For the purpose of driving the gears 35, any desired means may be used, for instance, a rack bar 38 slidably mounted in the base
110

39 in alinement with the gears 35. This rack bar may be driven by any suitable source of power, for instance, a cylinder 40 having its piston 41 connected therewith.

5 The motive power for this cylinder may be supplied from any desired source, such as an engine 42, as shown in Fig. 2. Under some conditions, such as when large stones are lifted by the dredge, it is desired to deposit

10 them to one side of the float and for this purpose the base 39 may be provided with a proper roller or ball bearing 43, and held thereon by a suitable clip as at 44 so that all of the parts carried thereby are freely ro-

15 tatable. For this purpose the parallel rack bars 38 may be connected together at one end by a cross piece 45 having therein an open sided socket 46 adapted to receive the head 47 carried by the piston 41, this socket

20 being open at its opposite ends permits the racks to be swung out of engagement with the piston head when it is desired to rotate all of the dredge members. The driving gears for the several parts are adapted to be

25 held out of mesh with the rack and frictionally locked under normal conditions, but to be released and thrown into engagement therewith during the period desired for operation. This may be accomplished by various

30 structures, but in the present instance by the eccentrically disposed bearing sleeve 48 encircling the shaft 34, as shown in Figs. 4 and 5 and having rotative bearings at 50. The opposite bearing sleeves 48 may be con-

35 nected together by the lever arms 49 and connecting rod 51. At one or both sides of the eccentric wheel 33 a drum 52 is secured and so disposed that when the gears 35 are thrown out of mesh with the racks 38 these

40 drums are brought into contact with the segmental brake shoes 53. By this construction the parts are held against movement by the friction of the drums and shoes, as soon as the driving gears are released or

45 separated from the separated racks and the operation of the parts correspondingly stops.

The winding drum 24, Fig. 3, is secured upon the shaft 54, as usual, and provided at one or both sides with brake drums 55

50 adapted to frictionally contact with the shoes 56 carried by the frame 13. The raising of the drum for this purpose is secured as just described in connection with the shaft 34, that is, the shaft 54 is provided

55 with an eccentric bearing sleeve 57 mounted in the bearing 58, those at opposite sides being connected by arm 59 and a cross bar 60 so as to operate in unison to lift the gears from contact with the rack and hold the

60 drum by the friction brake, as shown in Fig. 3. In order to prevent movement of the shaft 54 in both directions in the travel of the rack the gears 61 are loosely mounted thereon and provided with pawls 62 coöper-

65 ating with the ratchet 63 secured to the

shaft 54. By this means the motion of the rack in one direction is imparted to the drums, and the gears turn idly in the returning movement. The drum may also be held at its adjusted position and released when

70 desired by means of teeth 64 carried by the inner face of one of the brake drums 55 and adapted to coöperate with a pawl 65 mounted on the frame to coöperate therewith. It is obvious that any other desired or preferred

75 construction may be used for this purpose. This drum may also be used if desired for the purpose of lifting the anchoring spud 15 such being accomplished by means of the cable 66 extending to a suitable gripping de-

80 ceive 67 on the spud.

The scoop when dumping may deposit its material to both or either side of its arm and into any desired receptacle at that point, for instance, the troughs 68 which commu-

85 nicate with a sieve or screen 69 provided with the conveyer 70 as indicated in Fig. 1, the material passing through said screen being caught by trough 71 and conveyed to any preferred point.

90

In the operation of the invention the dredge arm is lowered and the scoop brought into the position shown by dotted lines at the bottom of Fig. 1, and then oscillated or partially rotated into the dotted line position

95 shown at the opposite end of said figure so that the scooped or dredged contents are carried in the body of the scoop till they reach the position above the float or scow when a rotative movement of the scoop

100 brings it into the discharging position shown by full lines in said figure, and the material therein passes by gravity to each side of the arm and is deposited into suitable receptacles. This oscillation of the scoop as well

105 as the raising and lowering of the arm is controlled from the platform and in an accurate manner by means of the rack and engaging gears which are adapted to be brought into contact with the rack only during the

110 driving period and at other times held in braked condition to prevent accidental movement thereof, this being accomplished by the eccentric sleeve which shifts the shaft relative to the rack and brings the brake

115 drums carried thereon into contact with the shoes for that purpose. The mounting of these parts as well as the mast and supporting boom permit a complete rotation thereof so that stones or larger material may be de-

120 posited upon the shore or at a distance from the float and during this movement the driving piston is disengaged from the rack if it is found convenient to dispose these parts as here shown.

125

By constructing the float of a series of parallel tubes properly sealed the most desirable form of support is secured which can be economically manufactured and requires the minimum depth of water to float the

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superposed body of the dredging apparatus, while the provision of the central channel through the float permits the dredging to be accomplished directly beneath and in line with the movement of the structure. The construction of the scoop and its mounting to discharge at an angle to the cutting edge thereof permits the direct application of the scoop at the eccentric wheel or lever by which the oscillatory motion is transmitted thereto. While this scoop has been described as oscillatory in its movement it will be obvious that a complete rotation may be given it, but the most advantageous results are secured by an oscillatory motion. It will therefore be seen that this invention presents a power dredge of simple construction adapted to be economically manufactured and adapted for very efficient work particularly in shallow water or small streams when the capacity is not sufficient to justify the use or expense of a large suction dredge.

Having described my invention and set forth its merits, what I claim and desire to secure by Letters Patent is:—

1. In a dredge, the combination with a hull having a longitudinally extending channel opening, of a scoop arm pivotally mounted in said opening intermediate of the ends of the hull, and an oscillating scoop upon the free end of said arm adapted to discharge upon one end of said hull.

2. In a dredge, the combination with a hull having a longitudinally extending channel opening, of a scoop arm pivotally mounted in said opening intermediate of the ends of the hull, an oscillating scoop upon the free end of said arm adapted to discharge upon one end of said hull, and means for swinging said scoop for a portion of its travel while lowered and for continuing said travel for discharge when raised.

3. In a dredge, the combination with a hull having a longitudinally extending channel opening, of a scoop arm pivotally mounted in said opening intermediate of the ends of the hull an oscillating scoop upon the free end of said arm adapted to discharge upon one end of said hull, means for swinging said scoop for a portion of its travel while lowered and for continuing said travel for discharge when raised, and means carried by said arm to deliver laterally from said scoop.

4. In a dredge, the combination with a hull having a longitudinally extending channel opening, of a scoop arm pivotally mounted in said opening intermediate of the ends of said hull, an oscillating scoop upon the free end of said arm adapted to discharge upon one end of said hull, means for swinging said scoop for a portion of its travel while lowered and for continuing said travel for dis-

charge while raised, means carried by said arm to deliver laterally from said scoop, and a holding spud disposed intermediate of the ends of said hull.

5. In a dredge, a hull, a scoop arm pivotally mounted at one end thereon, an imperforate scoop pivoted to the free end of said arm, means for moving said scoop for less than a complete rotation, and means for raising said arm.

6. In a dredge, a hull, a scoop arm pivotally mounted at one end thereon, an imperforate scoop pivoted to the free end of said arm, means for moving said scoop for less than a complete rotation, means for raising said arm, and discharge chutes carried by said scoop to deliver laterally at opposite sides thereof.

7. In a dredge, a scoop arm, an eccentrically disposed wheel at the free end of said arm, a cable for driving said wheel, and a scoop secured to the pivot of said wheel and having laterally deflected discharge chutes at opposite sides of the wheel.

8. In a dredge, a scoop arm, an eccentrically disposed wheel at the free end of said arm, a cable for driving said wheel, a scoop secured to the pivot of said wheel and having laterally deflected discharge chutes at opposite sides of the wheel, and a division plate carried by said scoop to inclose a portion of said wheel.

9. In a dredge, a hull, a scoop arm pivotally mounted thereon, a scoop mounted for oscillation upon the free end of said arm, a driving cable for oscillating said scoop, a rack bar and means for reciprocating the same, and driving gears for said cable and arm adapted to be intermittently engaged with said rack.

10. In a dredge, a hull, a scoop arm pivotally mounted thereon, a scoop mounted for oscillation upon the free end of said arm, a driving cable for oscillating said scoop, a rack bar and means for reciprocating the same, driving gears for said cable and arm adapted to be intermittently engaged with said rack, and a cooperating brake to retain said gear against rotation when disengaged from said rack.

11. In a dredge, a hull, a scoop arm pivotally mounted thereon, a scoop mounted for oscillation upon the free end of said arm, a driving cable for oscillating said scoop, a rack bar and means for reciprocating the same, driving gears for said cable and arm adapted to be intermittently engaged with said rack, a band wheel carried by the shaft of said gears, and a brake shoe disposed to engage said wheel when the gears are shifted from contact with said rack.

12. In a dredge, a segmental scoop having a lateral discharge chute, and means for imparting rotative movement to said scoop.

13. In a dredge, a segmental scoop having oppositely disposed lateral discharge chutes, and means for imparting rotative movement to said scoop.

5 14. In a dredge, a segmental scoop having oppositely disposed lateral discharge chutes, and an eccentric wheel intermediate of said chutes and at the rear of the segmental portion of the scoop.

10 15. In a dredge, the combination with a hull having a longitudinally extending channel opening, of a scoop arm pivotally mounted in said opening intermediate of the ends of the hull, and a holding spud mounted in said opening intermediate of said ends.

15 16. In a dredge, a rotatable platform, a mast mounted thereon, a scoop arm mounted on said mast, means carried by said platform for raising and lowering said arm, a 20 scoop carried by said arm, and means upon said platform for imparting a rotative movement to said scoop.

17. In a dredge, the combination with a hull having a rotatable platform thereon, of 25 a mast mounted on said platform, a scoop arm mounted on said mast, means carried by said platform for raising and lowering said arm, a scoop carried by said arm, means upon said platform for imparting a rotative 30 movement to said scoop, a driving member for said scoop, an arm mounted upon said platform, and an actuating device for said driving means relatively fixed to the rotative travel of said platform.

35 18. In a dredge, a rotatable platform, a mast mounted thereon, a scoop arm mounted on said mast, means carried by said platform for raising and lowering said arm, a 40 scoop carried by said arm, means upon said platform for imparting a rotative movement to said scoop, a driving member for said scoop, an arm mounted upon said platform, an actuating cylinder and piston, and an automatically detachable connection between 45 said piston and driving means.

19. In a dredge, a hull, a mast mounted thereon, a scoop arm pivoted thereto, a windlass for raising and lowering said arm provided with a driving gear, a scoop mounted 50 upon said arm for rotative movement, an actuating gear for said scoop, a reciprocating rack bar adapted to mesh with both of said gears, and means for shifting said gears relative to said rack bar.

55 20. In a dredge, a hull, a mast mounted thereon, a scoop arm pivoted thereto, a windlass for raising and lowering said arm provided with a driving gear, a scoop mounted upon said arm for rotative movement, an 60 actuating gear for said scoop, a reciprocating rack bar adapted to mesh with both of said gears, means for shifting said gears relative to said rack bar, a brake drum carried by the shaft of said gears, and a brake shoe adapted

to engage said drum when the gears are 65 shifted out of mesh with said rack bar.

21. In a dredge, a hull, a mast mounted thereon, a scoop arm pivoted thereto, a windlass for raising and lowering said arm provided with a driving gear, a scoop mounted 70 upon said arm for rotative movement, an actuating gear for said scoop, a reciprocating rack bar adapted to mesh with both of said gears, means for shifting said gears relative to said rack bar, a brake drum carried by the 75 shaft of said gears, a brake shoe adapted to engage said drum when the gears are shifted out of mesh with the rack bar, and means for preventing a reverse movement of said windlass in the reciprocation of said rack. 80

22. In a dredge, a hull, a mast mounted thereon, a scoop arm pivoted thereto, a windlass for raising and lowering said arm provided with a driving gear, a scoop mounted 85 upon said arm for rotative movement, an actuating gear for said scoop, a reciprocating rack bar adapted to mesh with both of said gears, means for shifting said gears relative to said rack bar, a cross head upon said rack 90 bar having an open socket therein, and a cylinder and piston rod provided with a head to removably engage said cross head.

23. In a dredge, a hull, a mast mounted thereon, a scoop arm pivoted thereto, a windlass for raising and lowering said arm provided with a driving gear, a scoop mounted 95 upon said arm for rotative movement, an actuating gear for said scoop, a reciprocating rack bar adapted to mesh with both of said gears, means for shifting said gears relative 100 to said rack bar, a cross head upon said rack bar having an open socket therein, a cylinder and piston rod provided with a head to removably engage said cross head, and means for permitting a rotative movement of all of 105 said parts relative to a fixed travel of said piston rod.

24. In a dredge, a hull, a mast mounted thereon, a scoop arm pivoted to said mast, a winding drum having a cable connected to 110 said arm, ratchet teeth provided upon the shaft of said drum, a gear wheel loosely mounted upon the shaft of said drum, reciprocating means for actuating said wheel, and a pawl carried by said wheel to engage said 115 ratchet.

25. In a dredge, a hull, a mast mounted thereon, a scoop arm pivoted to said mast, a winding drum having a cable connected to said arm, a gear wheel loosely mounted upon 120 the shaft of said drum, reciprocating means for actuating said wheel, a series of ratchet teeth upon said drum, and a pawl mounted upon a fixed part and adapted to engage said teeth. 125

26. In a dredge, a hull comprising tubular sections connected together, a platform thereon, a scoop arm carried by said platform, a

scoop mounted upon said arm for rotative movement, and means upon said platform for controlling the travel of said scoop and arm.

5 27. In a dredge, a hull, a scoop arm pivotally mounted thereon, an eccentrically disposed wheel at the free end of said arm, a scoop extending from the pivot of said wheel.

a cable extending from said wheel, and means carried by said hull for actuating said cable. 10

In testimony whereof I affix my signature in presence of two witnesses.

HORACE J. CLARK.

Witnesses:

ALFRED T. GAGE,
JOHN L. FLETCHER.