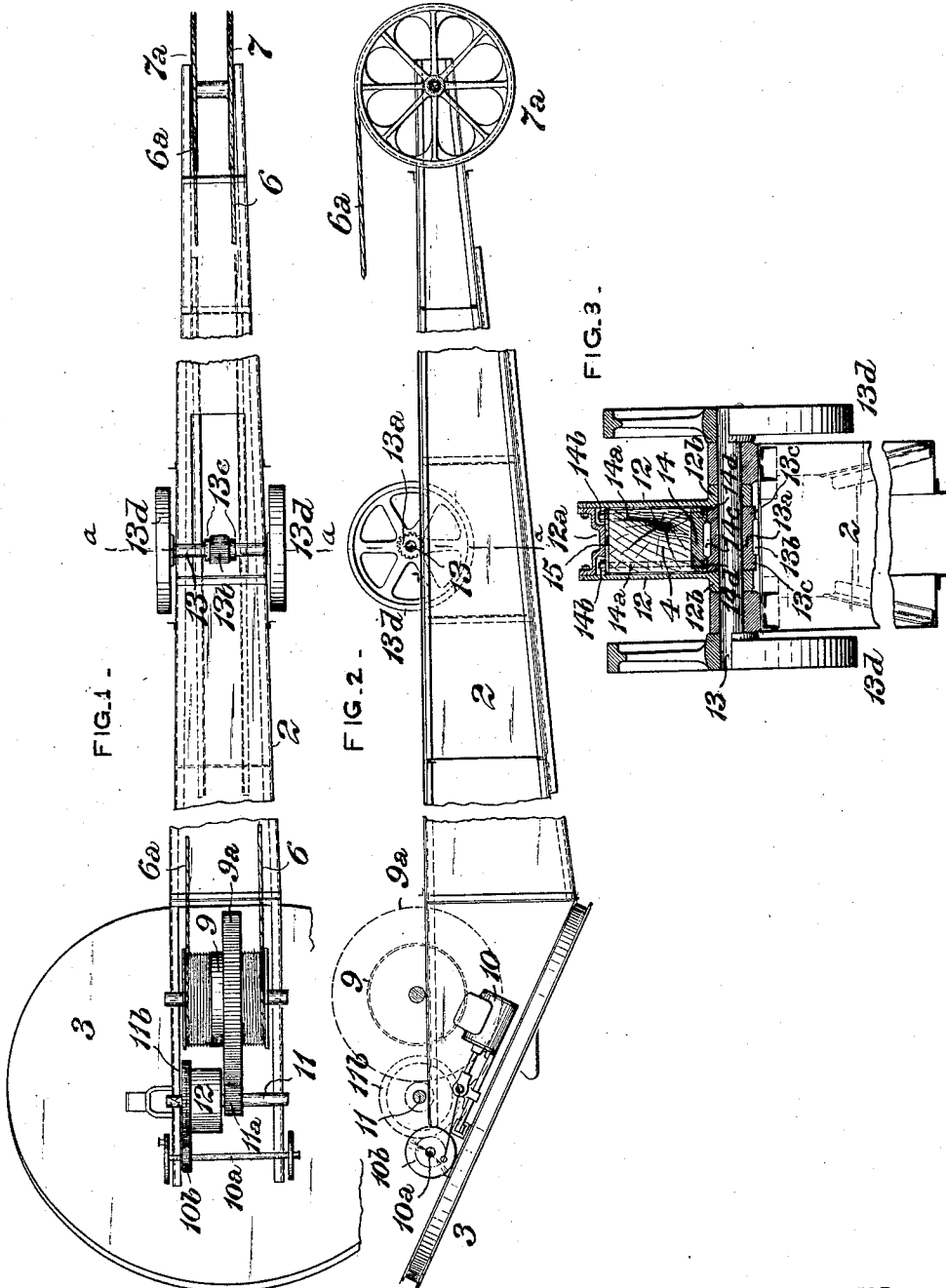


A. W. ROBINSON.
DIPPER DREDGE.
APPLICATION FILED SEPT. 29, 1910.

Patented Apr. 1, 1913.

1,057,501.



WITNESSES

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UNITED STATES PATENT OFFICE.

ARTHUR W. ROBINSON, OF MONTREAL, QUEBEC, CANADA.

DIPPER-DREDGE.

1,057,501.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed September 29, 1910. Serial No. 584,464.

To all whom it may concern:

Be it known that I, ARTHUR W. ROBINSON, of Montreal, in the Province of Quebec and Dominion of Canada, have invented a certain new and useful Improvement in Dipper-Dredges, of which improvement the following is a specification.

My invention relates, generally, to appliances of the class, comprehending dredges and steam shovels, in which the hoisting mechanism is mounted directly upon a swinging boom, and, more particularly, to the saddle block and coördinating parts for carrying the dipper arm.

The object of my invention is to provide a simplified and improved construction to provide simple and efficient means for carrying the single dipper arm in the saddle block, with provision for ready removal and compensation for wear as from time to time desired.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings: Figure 1 is a plan or top view of a dredger boom; Fig. 2 is a longitudinal central section through the same; and, Fig. 3 is a transverse section, on an enlarged scale, through the same, on the line *a a* of Figs. 1 and 2.

My present invention embodies in its main features, and constitutes an improvement upon, the general principle of certain of the constructions which are set forth in Letters Patent of the United States Nos. 708,588, 708,589, and 708,590, all granted and issued to me under date of September 1, 1902. As in Letters Patent No. 708,588, a boom, 2, which comprises two connected side members, of tapering form, secured at their lower and larger ends to a turn table, 3, which is journaled to rotate in a suitable bearing on the hull of a dredge. A solid or single dipper arm, 4, which passes through the boom, carries, on its lower end, the usual dipper, and is, as in Letters Patent No. 708,589, raised and lowered, as required for the performance of the work of the dipper, by two parallel lines of hoisting rope, 6, 6^a, which are, however, differently disposed from those of Patent No. 708,589, and are actuated by hoisting mechanism, located, as in Letters Patent No. 708,590, at the base of the boom, but of improved construction as hereinafter described. Two sheaves, 7, 7^a, are fixed upon a shaft, 7^b, which is journaled in bearings at

the point or outer end of the boom, 2, said sheaves being set sufficiently far apart to allow the dipper arm, 4, to pass between them. The two lines of hoisting rope, 6, 6^a, which are attached to the lower end of dipper arm 4, thence upwardly and over the sheaves, 7, 7^a, and thence downwardly to a hoisting drum, 9, journaled near the base of the boom, to which drum their ends are made fast. The hoisting drum, 9, is made of such length as to admit of the two parallel lines of hoisting rope, 6, 6^a, being simultaneously wound upon its end portions, leaving its middle portion, the length of which is substantially equal to the width of the dipper arm, 4, unoccupied by rope. A single hoisting gear, 9^a, secured on the middle portion of the drum, is actuated by a hoisting engine, 10, fixed to the base of the boom, to raise the dipper arm and dipper by the following intermediate mechanism. A pinion, 11^a, which meshes with the gear, 9^a, is fixed to the actuating member of a friction clutch, 12, and is mounted loosely therewith on a countershaft, 11, in order to be free to revolve when the members of the clutch are disconnected, so as to allow the dipper arm and dipper to drop when required. The countershaft, 11, carries a gear, 11^b, which engages a pinion, 10^b, on the shaft, 10^a, of the hoisting engine, 10, and when the clutch members are connected, the rotation of the engine shaft effects the rotation of the hoisting drum, 9, and consequently the elevation of the dipper arm and dipper. The friction clutch may be of any suitable and preferred construction, many of which are familiar to engineers, and does not form part of my present invention.

The dipper arm, 4,—see Fig. 3—is carried on the boom by and within a saddle block comprising two side plates, 12, 12, and a flanged top plate or separator, 12^a, bolted thereto. The inner ends of the side plates are provided with eyes, 12^b, which are fitted freely on a shipper shaft, 13, journaled on the top of the boom. A pinion, 13^a, fixed on the shipper shaft, engages a rack, 14, secured to the under side of the dipper arm by countersunk head bolts, 14^a, and nuts, 14^b. The rack, 14, is provided with a central row of teeth, 14^c, and with a wide shrouding or longitudinal rib, 14^d, on each side thereof, and the pinion, 13^a, is formed with a central row of teeth, 13^b, of

corresponding length, and two side shroud-
ings, or cylindrical portions, 13^c, on which
the shroudings, 14^d, of the rack can roll.

The shroudings of the rack and pinion are
5 provided for the double purpose of afford-
ing wide bearings or surfaces upon which
the weight of the dipper arm can be car-
ried without bearing upon the teeth, and of
providing sufficient spaces for the reception
10 of the bolts, 14^a, which secure the rack to
the dipper arm. It has heretofore been the
practice to pass these bolts through the rack
between the teeth, where there is insufficient
space to admit a head of proper size, the ob-
15 jection to which practice will be obvious.
This is especially unsatisfactory in the case
of the old form of dipper arm, which is
split and in two pieces, and in which the
racks are necessarily very narrow. A flat
20 plate of steel, 15, is fitted on the upper side
of the dipper arm, for the purpose of acting
as a bearing surface for the dipper arm on
the saddle block, in sliding through the lat-
ter, and as a washer plate or bearing for
25 the nuts, 14^b, of the connecting bolts. The
top plate, 12^a, of the sliding block, is pro-
vided with lateral grooves or recesses, to
enable it to clear the bolts, 14^a, and it is
firmly bolted to the side plates of the saddle
30 block, making a complete frame which in-
closes the dipper arm and through which
the latter can freely slide.

The shipper shaft, 13, is provided with
a brake wheel or brake wheels, 13^a, of the
35 usual construction, by the application of
braking force to which the shaft can be held
stationary, or the dipper arm be allowed to
slide freely through the saddle block while
revolving the shipper shaft and pinion, ac-
40 cordingly as may be desired. The position

and radius of working of the dipper is thus
controlled in the ordinary manner, as is
familiar to those skilled in the art.

The single dipper arm with the rack hav-
ing the wide lateral shroudings permits the 45
bolts securing the rack to the dipper arm to
be disposed so that they can be tightened at
any time; the saddle block entirely clears
the bolts and provides a sliding surface be-
tween the rows of bolts for the bearing of 50
the dipper arm; and the parts are construct-
ed and related so that they can be readily
taken up and assembled as conditions may
require.

I claim as my invention and desire to se- 55
cure by Letters Patent:

In an excavating appliance of the class set
forth, the combination of a swinging boom,
a saddle block comprising two side plates
having eyes for coupling it to the boom, 60
and a top plate having internal grooves
and lateral flanges above said grooves
through which it is bolted to the side plates,
a dipper arm fitted to traverse through the
saddle block and to bear on the top plate 65
thereof, a rack provided with a central row
of teeth and lateral longitudinal shroudings,
countersunk head bolts passing through said
shroudings and through the dipper arm,
nuts engaging said bolts within the grooves 70
of the top plate, and a pinion journaled on
the boom and provided with central teeth
engaging the teeth of the rack and lateral
shroudings abutting against the shroudings
thereof.

ARTHUR W. ROBINSON.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."