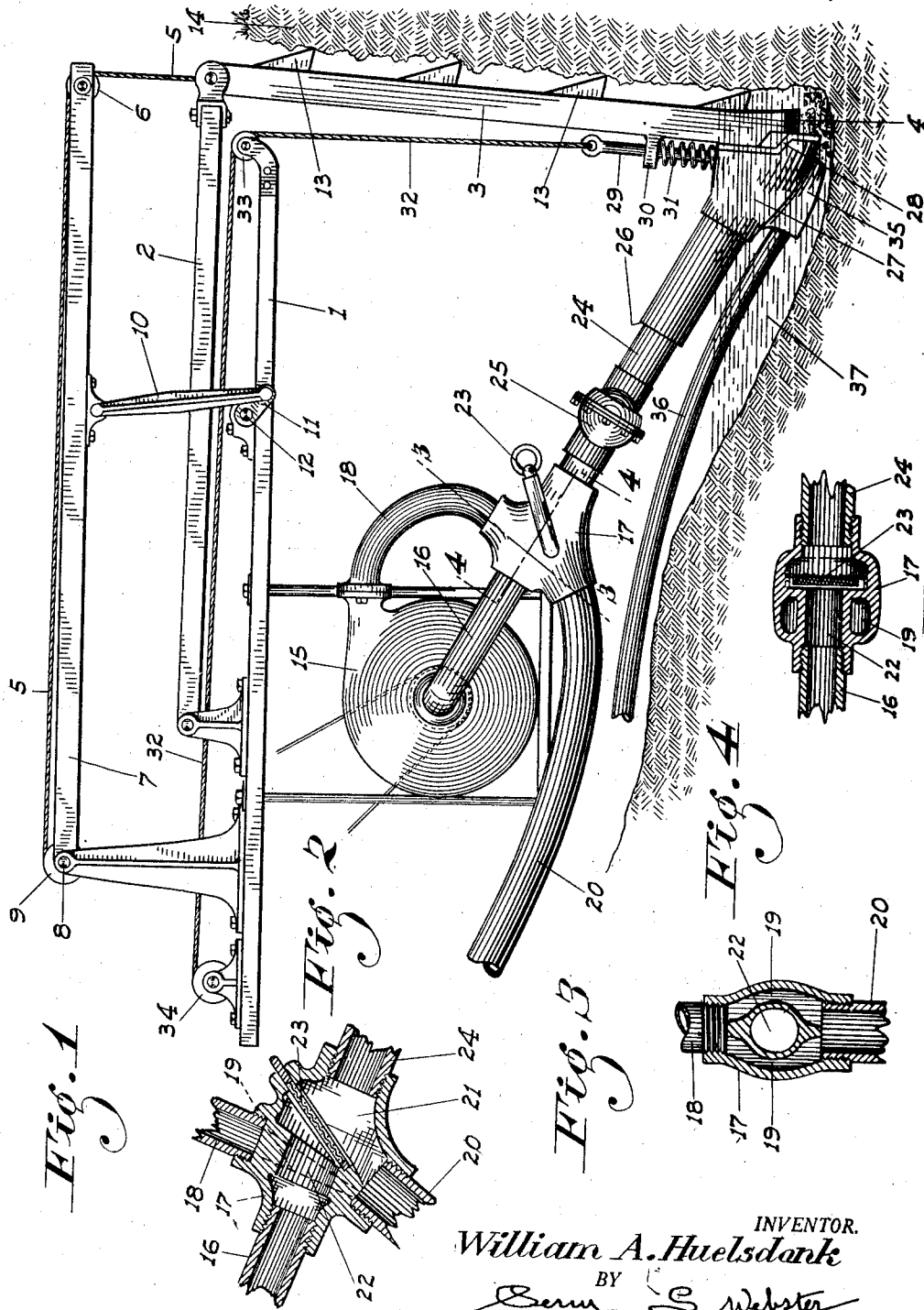


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COMBINATION EXCAVATOR, CRUSHER, AND DREDGER.
APPLICATION FILED JULY 31, 1919.

1,340,445.

Patented May 18, 1920.



UNITED STATES PATENT OFFICE.

WILLIAM A. HUELSDONK, OF SAN FRANCISCO, CALIFORNIA.

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Specification of Letters Patent.

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Application filed July 31, 1919. Serial No. 314,430.

To all whom it may concern:

Be it known that I, WILLIAM A. HUELSDONK, a citizen of the United States, residing at the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Combination Excavators, Crushers, and Dredgers; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in combined excavating and dredging devices, and particularly to a type adapted to be used in hydraulic mining, the principal object of the invention being to produce a device by means of which a rock bank may be gradually cut down, from such cuttings the over-sized rocks being then suitably crushed and acted on by a suction pump the same as the smaller rocks, gravel and sand, to be discharged therefrom at any desired point.

A further object is to use a suction pump in combination with the crusher so designed that the crushed rock and other solid material will be by-passed around the pump, and then discharged and will not be taken through the pump.

As a third object I have produced a device which will be inexpensive of construction and simple of operation and yet extremely efficient for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

On the drawings similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a side elevation of my complete device as installed and in operation.

Fig. 2 is a vertical longitudinal section through the by-pass of the pump.

Fig. 3 is a vertical cross section of the same taken on a line 3—3 of Fig. 1.

Fig. 4 is a horizontal cross section of the by-pass taken on a line 4—4 of Fig. 1.

Referring now more particularly to the figures of reference on the drawings, the numeral 1 represents the supporting framework for the mechanism of the device. This framework is adapted to be moved along the ground or floated on water as the work

progresses and may rest directly on the surface, or may have such supporting timbers as may be rendered necessary by varying ground contours, but is preferably carried on a barge or raft.

One end of a beam 2 is pivotally mounted to the frame 1, the other end being pivotally connected to the upper end of a crusher or stamp beam 3 having a stamp-head 4 suitably attached to the lower end thereof.

One end of a cable 5 is attached to the upper end of the beam 3, passing over a sheave 6 on the end of a walking beam 7 pivotally mounted to the frame as at 8. Turnable about such pivotal point is a drum 9 on which the cable 5 is wound.

The walking beam 7 has a connecting rod 10 which rod has vertical movement and is actuated by a crank arm 11 on a shaft 12 mounted to the frame 1, said shaft being turned by any suitable power means (not shown).

The outer face of the beam 3 is provided with a plurality of picks 13, adapted to engage the face of the bank 14 and cut away fragments thereof with each downward movement of the beam 3.

Suitably mounted to the frame 1 and below the same is a pump 15 preferably of the centrifugal type having an inlet pipe 16 which is screwed into one end of a casting 17. The outlet or discharge pipe 18 from the pump is screwed into the top of the casting 17. The casting is provided with a double or divided passageway 19 connecting with the pipe 18 above and with a larger discharge pipe 20 screwed into the lower end of the casting 17, the passageway or nozzle being of oblong cross sections at the bottom and terminating adjacent the forward or pump end of the casting to permit of free access to the pipe 20 from the main interior chamber 21 of the casting 17 for a purpose as will be seen.

The divided passageway 19 forms an orifice or passageway 22 therebetween connecting the pipe 16 with the chamber 21. These passageways are preferably formed integral with the casting 17, and it is of course understood that suitable separation walls prevent direct communication therebetween. Slidably mounted in the chamber 21 in front of the mouth of the passageway 22 and across the same is a screen 23. This is set at a suitable angle and projects to the outside of the casting in order that the same may be removed for cleaning or renewal.

Into the rear of the casting 17 and chamber 21 therein is screwed the extension 24 of the intake pipe, this being provided with a suction hose connection or ball and socket joint 25 and a slip joint 26. The pipe 24 terminates at its lower end in an open ended casting 27 which has a screen or grizzly 28 across its mouth, which is adjacent the stamp-beam 3. A guide rod 29 is fixedly mounted on top 10 of the member 27 on which slides a guide 30 secured to the beam 3, a spring 31 being interposed on the rod 29 between the guide and the member 27.

The upper end of the bar 29 is provided 15 with an eye in which is secured one end of a cable 32 which passes over a sheave 33 on the frame 1 and thence to a cable drum 34 on said frame.

A hydraulic nozzle 35 is secured to the 20 member 27 underneath the same and is connected by a hose 36 with any suitable water supply.

The operation is as follows:—

Assuming the device has been suitably positioned for operations adjacent a mineral bearing bank, the bar 3 is caused to move 25 up and down by the action of the connecting rod 10. This movement causes the picks 13 to engage the bank and some of the material thereof is broken off and falls into the 30 pit, pond or sump 37 in which a certain level of water is maintained, the flow of water through the outlet nozzle 35 keeping the material in the sump well stirred up.

Any rock too large for the suction pipe, 35 which has been cut from the bank with the fine material, is carried against the grizzly 28 by the suction of the pump, where it is broken up by the stamp 4. Should there be 40 no rock under the stamp at the time of its descent, the spring 31 will take the shock. The pump 15 then draws water, rocks, gravel and sand through the grizzly and pipe 24. The screen 23, however, interposed 45 in the line of intake to the pump is of sufficiently small mesh so that nothing too coarse to pass through the pump can pass therethrough.

The casting 17 is of sufficiently larger size 50 than the pipes entering therein that the chamber 21 thereof will be so large proportionate to the said pipes so that the water passing from the outlet of pipe 24 to the intake of pipe 16 will have such a low velocity 55 that no heavy, solid material will tend to be drawn against the screen 23, but will drop into the pipe 20 by the force of gravity.

The rock, etc., therefore falls into the 60 pipe 20 while the water passing through the pump is thence forced through the outlet 18 and nozzle 19 into the pipe 20 where it forces the rock, etc., collected therein out of the pipe 20 to be discharged into a sluice 65 box or any suitable receptacle.

Should it be desired to operate at a greater or lesser depth, the cables 5 and 32 are drawn up or let out, this raising or lowering the beam 3 and the pump intake pipe 24 the desired distance. 70

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfils the object of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction 75 of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended 80 claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:—

1. A combination excavator, crusher, and 85 dredger comprising a frame, a walking beam pivotally mounted to the frame and adapted for vertical movement, a stamp-beam pivoted at one end of the walking beam, picks on the outer edge of the beam, 90 a stamp-head on the lower end of the beam, a suction pump whose intake is adjacent the stamp-head, and a grizzly between the intake and stamp-head whereby rocks of large size will not be carried into the intake until 95 broken up by the stamp.

2. A combination excavator, crusher and dredger comprising a frame, a walking beam pivotally mounted to the frame and adapted for vertical movement, a stamp-beam pivoted at one end of the walking beam, picks on the outer edge of the beam, a suction pump, an intake pipe therefor having a flexible connection therein and whose intake is adjacent the stamp beam, a grizzly 105 covering said intake, a guide rod on said intake coacting with a guide on the stamp-beam, means for raising or lowering said intake pipe, and means for raising or lowering the stamp-beam independent of the 110 motion imparted thereto by the walking beam.

3. The combination with a rock crushing stamp, of a suction dredging means, such means comprising a suction pump, an intake 115 pipe whose mouth is adjacent the stamp, a discharge pipe, and means interposed in said intake pipe whereby the solid material drawn up into the intake pipe will be diverted therefrom into the discharge 120 pipe of the pump without passing through the pump.

4. The combination with a rock crushing stamp of a suction dredging means, such means comprising a suction pump, an intake 125 pipe whose mouth is adjacent the stamp, a discharge pipe passing around the intake pipe to form a nozzle discharging into a further discharge pipe having communication with the intake pipe, and a removable 130

screen interposed in the intake pipe just
forward of the last named discharge pipe,
whereby water may pass into the pump
therethrough but coarse material carried
5 into the intake pipe will be diverted into the
last named discharge pipe and will be forced
along the said pipe by the force of the water

issuing from the first named discharge pipe.
In testimony whereof I affix my signature
in presence of two witnesses.

WILLIAM A. HUELSDONK.

Witnesses:

VERADINE WARNER,
FRANK H. CARTER.