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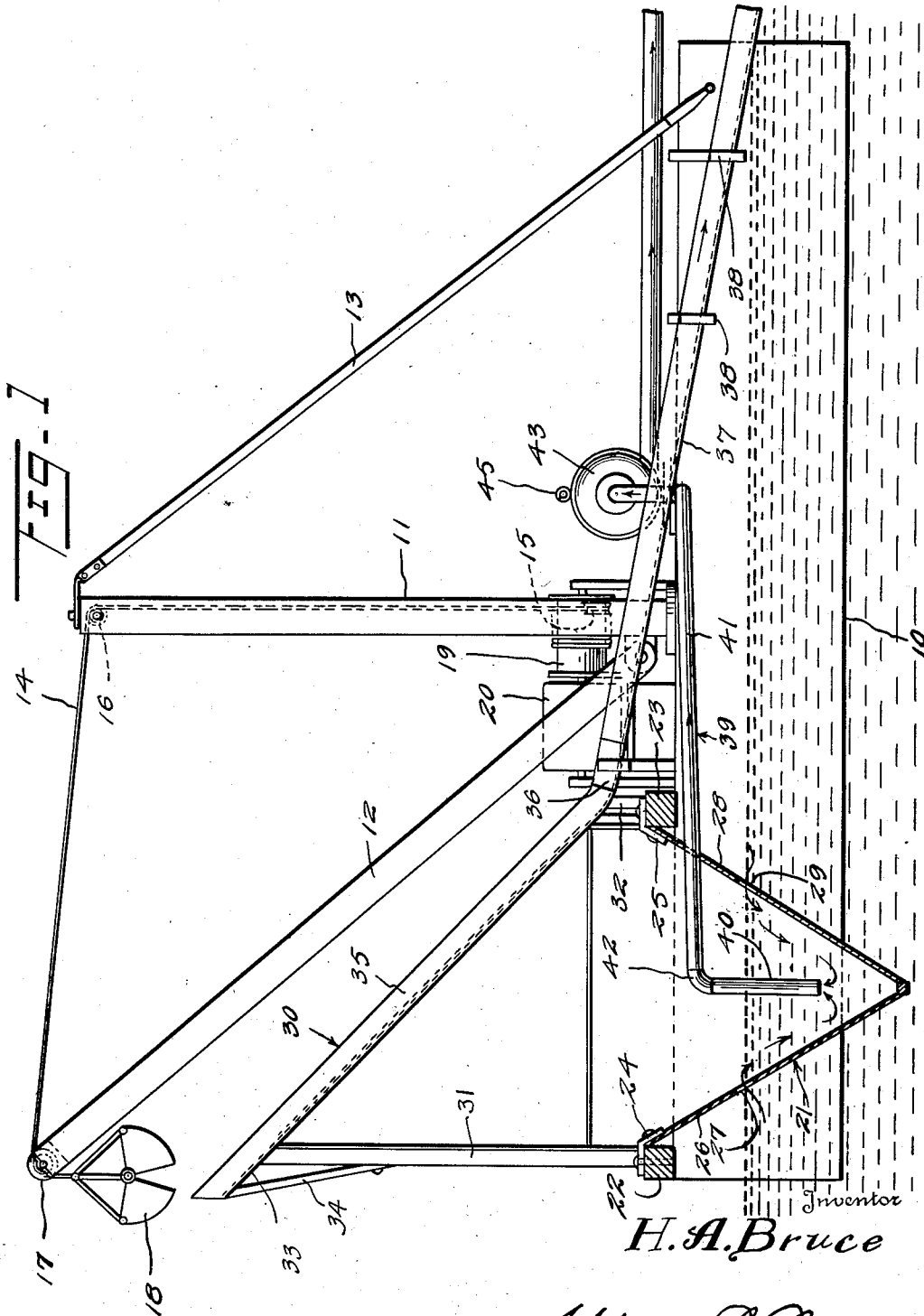
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SAND DREDGE AND CLEANING SYSTEM

Filed Feb. 27, 1934

2 Sheets-Sheet 1



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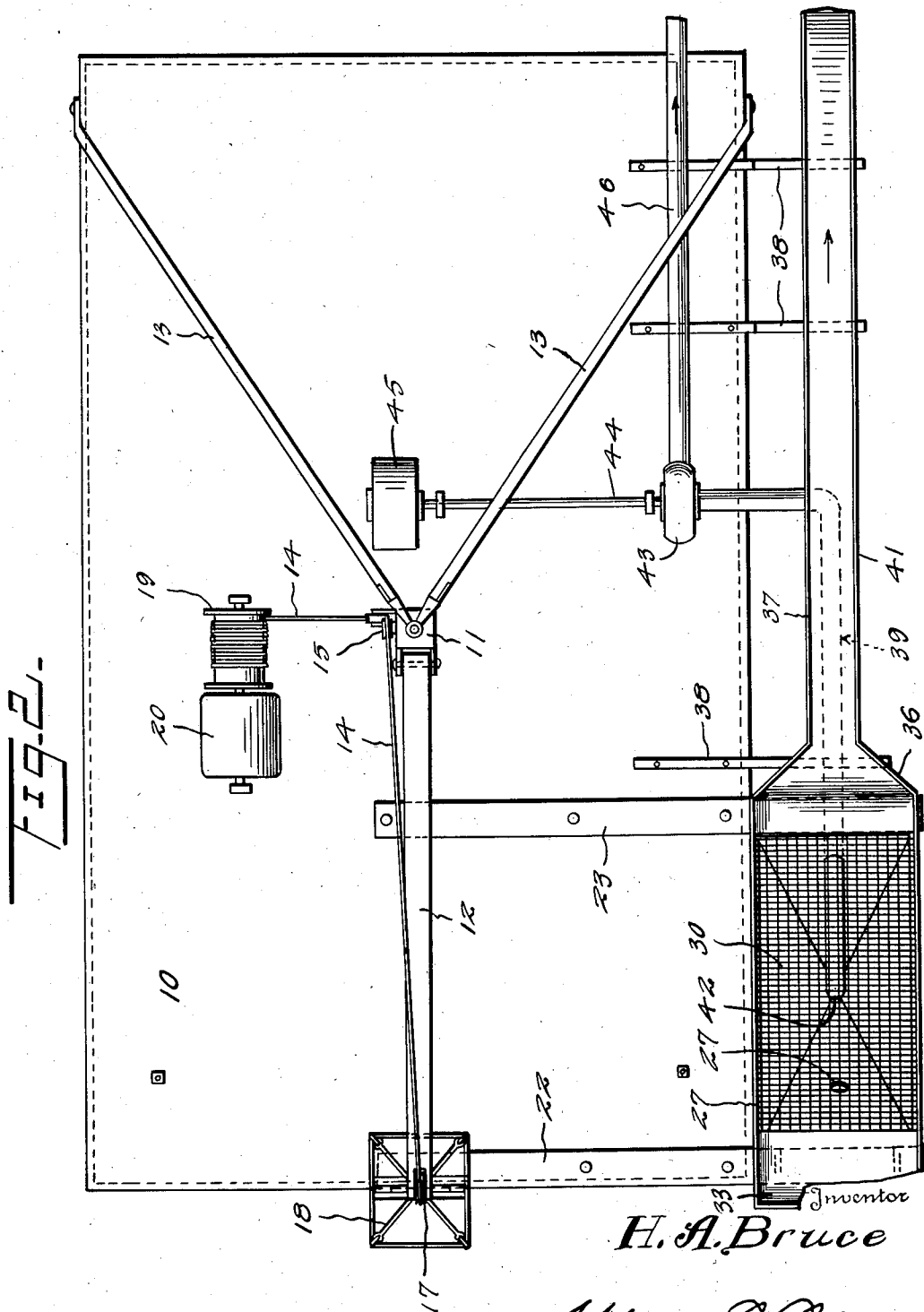
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SAND DREDGE AND CLEANING SYSTEM

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4 Claims. (Cl. 262—2)

This invention relates to sand dredging operations and has for an important object thereof the provision of a means and a system for dredging to a greater depth and producing cleaner sand and gravel.

Another object of this invention is to provide a means whereby a smaller suction pipe can be used in the dredging operation and a smaller pump and motor used but at the same time, the production of the dredge increased and the material forced through a greater length of pipe than is possible with the types of apparatus at present available.

A further object of this invention is to provide a means whereby the sand, after being taken off of the bottom of the river or other location, will be initially washed by clean water so that when the material is transferred to the pump and from thence to the tipple, the sand will be more clean than is possible with apparatus at present available.

A still further object of this invention is to provide a dredging system which will increase the capacity of the dredging operation and which has a relatively short suction pipe, thereby permitting the use of a smaller pump and a smaller motor for operating the pump.

A still further object of this invention is to provide a dredging means of this type wherein the depth of the dredging operation will not be limited to the length of the suction pipe and wherein the dredging operation will not be clogged up by relatively large pieces of material requiring the frequent stoppage of the dredging operation.

Still another object of this invention is to provide a device of this type wherein the material which ordinarily acts to clog up the suction pipe will be carried away from the suction pipe and deposited at a point rearwardly of the barge or dredge, thus permitting the continuous operation of the dredge.

The above and various other objects and advantages of this invention will in part be described and in part be understood from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawings wherein:—

Figure 1 is a detail side elevation partly in section of a device constructed according to the preferred embodiment of this invention.

Figure 2 is a top plan view of the device.

Referring to the drawings wherein like numerals of reference designate corresponding parts throughout the views, the numeral 10 designates

generally a barge or buoyant body of suitable configuration which has pivotally mounted thereon a post 11 held in a vertical position by bracing members 13 secured at one end to the top of the post 11 and at the other end to the barge or floating body 10 at the opposite sides and adjacent the rear. A boom 12 is swingably secured at its lower end to the swinging post 11 and a hoisting cable 14 is trained over a lower sheave 15 and an upper sheave 16 mounted on the post or upright 11.

A sheave or grooved pulley 17 is carried by the upper or outer end of the boom 12 and the cable 14 is trained over this grooved pulley or sheave 17 and has secured to an end thereof a grab bucket 18 of suitable construction. The cable 14 is connected to a winch or hoist member 19 mounted on the deck of the barge 10 at one side of the crane structure including the post 11 and the boom 12, and the winch 19 is operated by means of a motor or power member 20. The winch 19 and the power member 20 are here shown only diagrammatically as any suitable cable operating means may be used to raise and lower the bucket 18.

A sand hopper or receiver, generally designated as 21, is mounted at one side of the barge 10, being held in outstanding relation to the barge 10 by means of beams 22 and 23. The hopper or receiver 21 is constructed in substantially pyramidal form and is inverted with the apex thereof downwardly. The receiver 21 is secured to the beams 22 and 23 by means of brackets or attaching members 24 and 25, respectively. These attaching members 24 and 25 are constructed of strap iron or the like. The hopper 21 is open at the top and in the front wall 26 thereof, there is provided an opening 27 which is substantially on the water line. The rear wall 28 of the hopper or receiver is also provided with a discharge opening 29 alining with the intake opening 27 so that clean or clear water may freely enter the intake opening 27 and wash out the floating dirt or material including the dirty water through the discharge opening 29.

A screen member 30 is supported on the beams 22 and 23 in a position inclined to the horizontal with the highest end foremost. The screen 30 is supported at its highest or front end by means of supporting pillars or posts 31 and at its rear or lower end by means of supporting posts 32. A shield or extension 33 is carried by the screen 30, which extends beyond the upper ends of the posts 31 and is braced as by a bracing member 34 so that the material discharged from the bucket 18

will not drop back into the water. The screen 30 has upstanding sides 35 and at the bottom of the screen, there is provided a chute 36 which converges rearwardly and discharges into a rearwardly extending and downwardly inclined waste trough 37 supported by brackets or beams 38 which engage the barge 10.

A suction pipe, generally designated as 39, is provided with an intake pipe member 40 connected to a pipe 41 by means of an elbow 42. This pipe 40 is open at its lower end and extends downwardly in the direction of the apex or bottom of the receiver 21. The lower end of the suction pipe member 40 is below the openings 27 and 29 in the receiver 21. The pipe 41 is connected to a suction pump 43 which is operated by a shaft 44 connected to a motor or power member 45. The suction pump 43 is of conventional construction and the material drawn out of the hopper or receiver 21 by the pump 43 is transferred or forced into a discharge pipe 46 which may be extended for any suitable length and the material therein discharged into a tipple or other suitable receiver remote from the barge 10.

In the use and operation of the device hereinbefore described, the barge 10 is moved to the desired location and the motor or power member 45 set in operation so as to lower the grab bucket 18 to the bed of the stream. It will be apparent from the foregoing that when the grab bucket 18 is lowered, the bucket can be lowered to any suitable depth, being limited only by the length of the cable 14. In raising the filled bucket 18 in the water, the top dirt will wash off before the bucket is lifted out of the water. The bucket 18 is then raised above the screen 30 and discharged. The apron or shield 33 will prevent the material from dropping back into the stream and the material will then flow downwardly or pass along the length of the screen 30 by gravity with the desired size of sand and gravel passing through the screen and the undesired larger pieces of material sliding down the screen and into the waste trough 37.

When the sand and gravel of desired size is discharged into the hopper or receiver 21, it will be discharged into the water which is constantly in this hopper 21 and as the dredging operation is usually performed in a flowing stream, the water will flow through the openings 27 and 29, and any dirty water or floating material will be washed out of the hopper so that it will not enter the suction pipe 40. Due to the fact that the screen 30 cleans out the rocks, logs and other undesired material before this material enters the hopper or receiver 21, the pipe line 39 will not be clogged up and this pipe line 39 can, therefore, be a smaller pipe line than is possible where provision must be made to prevent relatively large objects from clogging the intake end of the suction line.

With the use of the device hereinbefore described, it is possible to maintain a continuous operation, thereby increasing the quantity of material removed from the bed of the stream and, in addition thereto, the depth from which the material is removed is not limited by both the length of the suction pipe and the power of the pump, as is the case in dredges at present available. The depth of the dredging operation in the present instance is limited only by the length of the cable 14. It will also be apparent from the

foregoing that the power of the suction pump 43 will remain constant due to the fact that the suction pipe line 39 is not either lengthened or shortened during the dredging operation.

What is claimed is:—

1. A dredging means comprising a barge, a receiver, means for supporting the receiver on one side of the barge in partly submerged position in water, said receiver having intake and outlet openings in the walls thereof at substantially the water level to permit the water of the stream to flow freely through the upper portion of the receiver, a screen, means for supporting the screen in an inclined position above the receiver, means for discharging material onto the screen, means for carrying away the oversize material and discharging said material remote from the receiver, and suction means for removing the material from the receiver.

2. A dredging means as set forth comprising a barge, a hopper, means for supporting the hopper at one side of the barge in partly submerged position in the water, said hopper having intake and outlet openings intermediate the top and bottom thereof to permit the water of the stream in which the barge is positioned to freely flow therethrough, a screen, means for supporting the screen in an inclined position above the hopper, a grab bucket operating means carried by the barge, means for carrying off the oversize material and discharging said material remote from the hopper, a suction pipe for withdrawing the material in the hopper below the openings thereof, and a suction pump connected to the suction pipe.

3. A dredging means as set forth comprising a barge, a hopper, means for supporting the hopper at one side of the barge, said hopper having water intake and outlet openings intermediate the upper and lower ends thereof to permit the water of the stream to flow freely therethrough at the water level, a screen, means for supporting the screen above the hopper, a grab bucket for discharging material onto the screen, and operating means for said grab bucket, means for carrying off oversize material and discharging said oversize material remote from the hopper, a suction pipe opening into the lower portion of the hopper, and a suction pump connected to the pipe.

4. A dredging means as set forth comprising a barge, a hopper mounted on one side of the barge in a partly submerged position, said hopper having intake and outlet openings in opposite walls to permit the free passage of water therethrough at substantially the level of the water in which the barge is positioned, said hopper having downwardly converging walls, a screen, means for supporting the screen above the hopper in an upwardly and forwardly inclined position, an apron carried by the upper portion of the screen, a grab bucket, operating means for the grab bucket to permit the discharge of material onto the screen, a waste material trough connected at one end to the lower portion of the screen and discharging at a point remote from the hopper, means for supporting the trough in outstanding position at one side of the barge, and suction means for withdrawing the material from the lower portion of the hopper.

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