Jan. 8, 1929. 1,698,515

R. T. STEWART

METHOD OF AND MEANS FOR USE IN DREDGING

Filed March 10, 1927 2 Sheets-Sheet 1

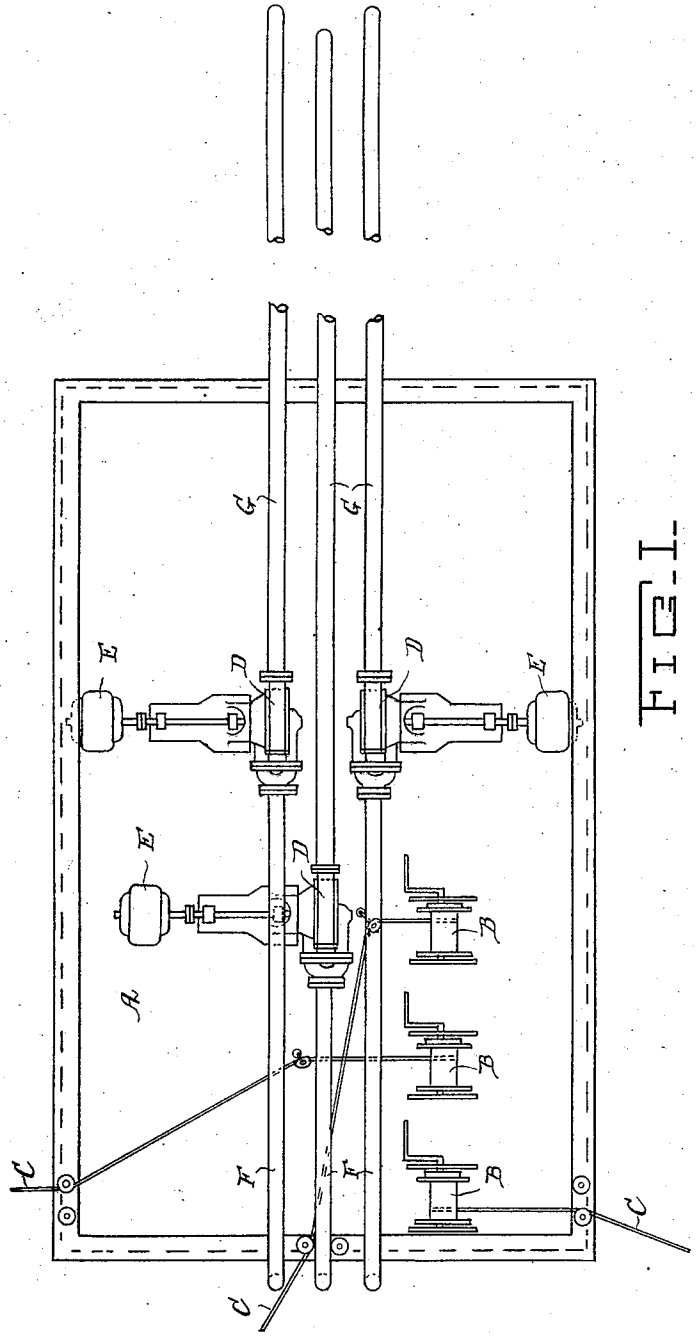


FIG. 1.

Inventor
Robert Thomson Stewart
By
Pennie, Davis, Marvin & Edmonds
Attorneys

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R. T. STEWART

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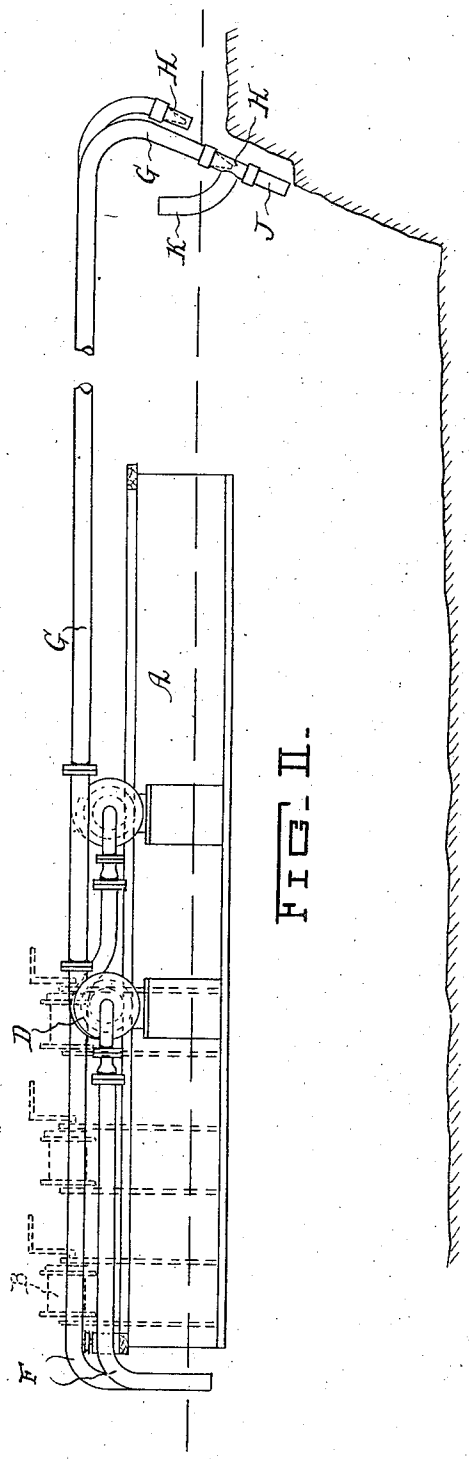


FIG. II.

Inventor
Robert Thomson Stewart
By
Fenning, Davis, Marvin & Edmonds
Attorneys

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UNITED STATES PATENT OFFICE.

ROBERT THOMSON STEWART, OF DUNEDIN, NEW ZEALAND.

METHOD OF AND MEANS FOR USE IN DREDGING.

Application filed March 10, 1927, Serial No. 174,149, and in New Zealand March 18, 1926.

This invention has for its object the clearing and scouring, or sweeping, of the bottoms of rivers, or other water courses, for the purpose of removing mud, weeds or silt accumulating therein, or for deepening or widening the courses. The invention may also be adapted to the digging of new canals, or new channels for rivers and for loosening the beds of rivers, lakes or streams so that the loosened material may be lifted for treatment, as for separating any gold or other metallic contents thereof.

The invention consists in a method whereby combined jets or streams of water and air are applied to the surfaces being treated whether such surfaces are below water, or uncovered, and also in the means employed for carrying out such operations.

The said method consists in the forcing of water, under pressure, through pipe services leading to nozzles, and the connection of such pipe services with air supply so that the jet issuing from the nozzle will be given an encircling sleeve of air that will enable it to penetrate through a body of water without losing its jet form or any appreciable part of its velocity and upon the jet being broken up, as when directed upon an obstacle, a mingling or combining of air and water will be effected to cause ebullition.

This method of treatment is carried out by the use of pumps, driven by any approved and available power, and systems of piping connected therewith so that water is drawn from a body of water and forced through pipes leading to nozzles, such pipes being either led through an air chamber or provided with air inlet branches so that the passage of water will induce an inrush of air to combine with the water in the manner required. This apparatus is preferably formed as a self contained unit by assembly of the pumps and means for driving them upon a pontoon that will float on the water, and may be moved about from place to place.

The invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a plan of the apparatus designed for carrying out the invention.

Figure 2 is a side elevation thereof.

The apparatus, as shown, is designed to provide means whereby a combined stream or jet of water and air is employed in conjunction with jets of water only, such latter jets being directed to the loosening of earth upon the edges of a body of water. It will however, be readily understood, that such conjunction is not a necessity and that all of the jet producing means may be made to provide for the combination of water and air.

The said apparatus comprises a pontoon A adaptable for floating on the water and of supporting the pumping and power appliances employed. Such pontoon may be fitted with winches B for operating mooring ropes C so that the pontoon may be shifted about as required, and moored at any desired spot.

On the pontoon are arranged turbo pumps D, or any other approved type of water pump, and each of these is driven by an electric motor E also arranged on the pontoon. Any other driving agency may, however, be employed, as for instance, internal combustion engines, steam engines and so on. The pumps employed are preferably of a nature such as to provide a continuous and even flow of water, as distinct from a pulsating flow, as with reciprocating pumps.

An inlet pipe F leads to each pump such pipe at its inlet end dipping into the water upon which the pontoon floats.

An outlet pipe G leads away from each pump and this outlet pipe may be carried away for any desired length and at its end is provided with a nozzle fitting H of any approved form such as to ensure of the water issuing as a strong jet from the nozzle. The nozzles may thus be directed to act upon any spot whether under or above water.

For obtaining the combined air and water jet, the outlet pipe G is provided with an extension J beyond the nozzle which extension forms an air or mixing chamber. An air inlet branch K enters the side of this chamber, just beyond the nozzle outlet, so that as the water jet emerges, air is induced to pass in through this branch and such air then combines with the water jet to obtain the effect beforementioned, and also to enwrap the jet specially with a sleeve of air that will permit of it passing through a body of water for a distance without merging therewith. When the nozzle is directed to any point or surface below the water level, the air inlet branch is naturally extended to above the water level.

The apparatus employed may vary in its details from that shown in the drawings, as

for instance the jet discharging pipes may be made flexible and adaptable for directing the water and air jets over any desired area by movement about thereon, as with an ordinary hose.

These combined water and air jets will act upon subaqueous growths or weeds with great force to loosen and tear their roots from the soil so that they will float clear and then may be collected from the surface, or allowed to flow away with the stream. The jets also may be used to set free, by agitation, deposits of silt or mud upon a river's bed in order that such also may be washed away, and, in addition, may be directed on to the sides and bottoms of river beds or lagoons, or other bodies of water, to loosen them and render the loosened material suitable for handling by any approved means.

I claim:—

1. A method of treating river and other courses consisting in the subjection of the surfaces thereof to the action of jets of combined water and air obtained by the forcing of water through nozzles into and through air chambers, substantially as specified.

2. Means for carrying out the method described in claim 1, consisting in the combination with a pontoon of a water pump mounted thereon, an inlet pipe leading to such pump and an outlet pipe leading therefrom having a nozzle at its delivery end and an air chamber through which the water passes, which chamber has an air inlet, substantially as specified.

3. Means for carrying out the method described in claim 1, comprising, in combination, a pontoon, a water pump and driving means therefor, mounted on such pontoon, a water inlet pipe leading to such pump, and an outlet pipe leading therefrom having a nozzle at its delivery end and an air chamber into one end of which the nozzle extends, and an air inlet branch leading into the side of such chamber, substantially as specified.

In testimony whereof, I affix my signature.

ROBERT THOMSON STEWART.