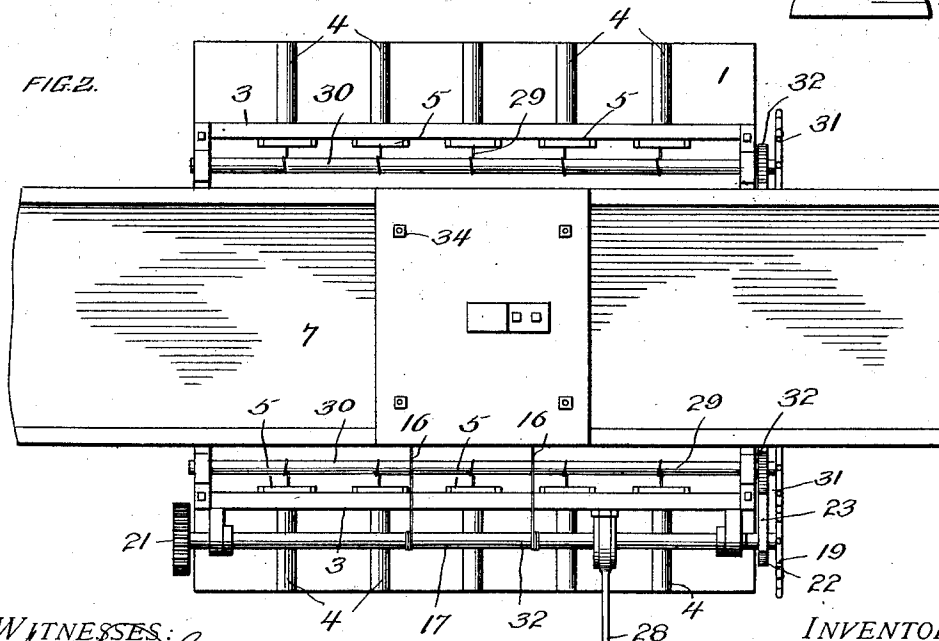
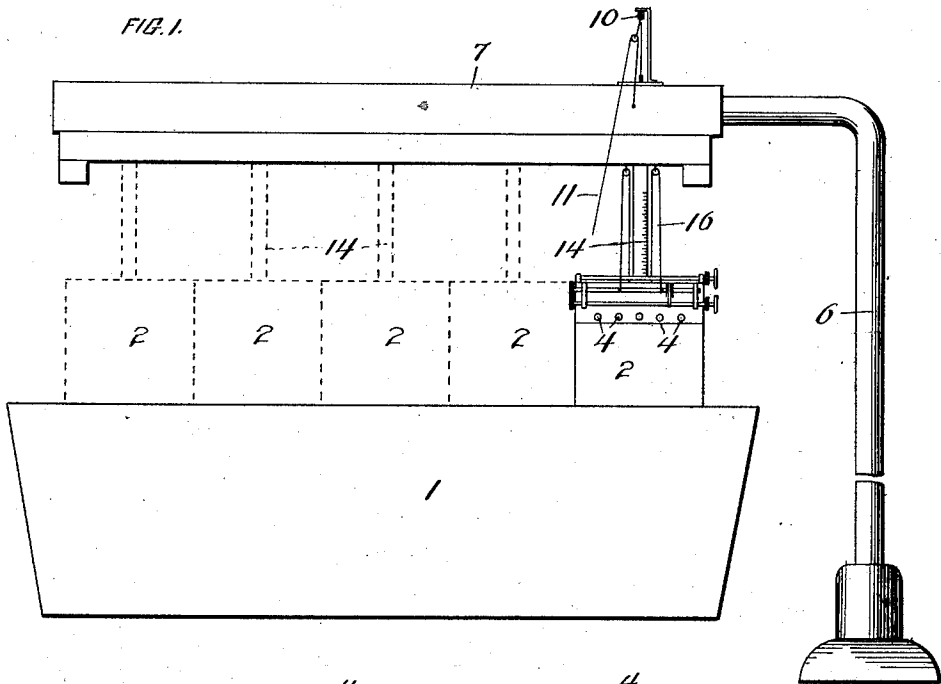


S. A. GEOGHEGAN.
METHOD OF DREDGING CHANNELS.
APPLICATION FILED APR. 18, 1911.

1,015,170.

Patented Jan. 16, 1912.

4 SHEETS—SHEET 1.



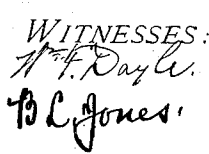
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

FIG. 4.

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UNITED STATES PATENT OFFICE.

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METHOD OF DREDGING CHANNELS.

1,015,170.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, STEWART A. GEOGHEGAN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Methods of Dredging Channels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in the method of dredging and deepening channels in waterways, and commonly known as hydraulic suction dredging.

Prior to my invention it has been usual to cut up the silt or sand at the bottom by submarine plows or rotary cutters, which material agitated and mixed with the water is drawn up by a centrifugal pump and successively delivered at the top of a series of "pockets" rising from the bottom of the dredge, and with the coaming of said pockets rising above the deck of the dredge and provided with overflow pipes or channels, through which, when said pockets become full, and while the silt and sand mixed and held in suspension in the water is gravitating toward the bottom of the pockets the water and silt or sand being delivered reaching the level of the overflow pipes or channels flows overboard. As the said matter accumulates at the bottom and increases in depth and volume, which is determined by suitable hand sounding devices, the supply of water and solid material held in suspension is permitted to overflow through the coamings of the pocket and is returned to the waterway.

During the time required by the process of gravitation for the pockets to become filled with solid matter, much the larger percentage of the said matter (estimated by experience to be from seventy-five to eighty-five per cent.) is returned through the overflows and in due course is deposited at some other locality in the waterway.

In all contracts for removing solid matter from the bottom of waterways it is the custom to pay a contract price per cubic yard of such material accumulated in the

pockets of the dredge and delivered at the dump, which is determined by measurements of the contents of the several pockets upon the dredge.

From this brief description of the present method of operation it will be readily understood that only a limited amount of the material removed from the bottom is compensated for. Not only is this the case, but it will be apparent that the time required for the gravitation of the said matter, and the fuel involved in the corresponding operation of the apparatus are necessary elements of expense which I contemplate eliminating by my improved method and apparatus, which correspondingly involves profit in the results.

My invention has for its object to recover and deliver at the dump substantially all of the solid matter removed from the bottom of the waterway, which involves the two-fold advantage of avoiding the deposition of the solid material at some other locality by the process of gravitation, and a better compensation to the contractor for labor performed.

With these ends in view, my invention consists in the generic idea of delivering the water admixed with the solid material initially at the bottom of the several pockets, and then successively adjacent to the upper surface of the accumulating solid material, in contra-distinction to liberating the same at the top of the pockets and depending upon the slow process of gravitation.

In order that the generic feature of my improved method may be fully understood, attention is called to the fact that the solid material held in suspension in the water having greater specific gravity than the water, if delivered in the manner stated, will not rise, but immediately settles at the bottom and successively upon the deposit.

In carrying forward my improved method I have devised an apparatus which will constitute the subject matter of a divisional application which I contemplate filing and which, from practical experiment, I have found well adapted for the purpose, and in order that those familiar with the art may more fully understand my improved method and apparatus, I will proceed to describe

the same more in detail, referring to the accompanying drawings, in which—

Figure 1 is a diagrammatic side elevation of a dredging apparatus I have devised for carrying out my improved method; the dredge boat shortened to conform to size of paper; Fig. 2 is a plan view illustrating the arrangement of the overflow pipes or channels; Fig. 3 is an elevation of one of my improved pockets and the means for delivering the water and solid matter thereto; Fig. 4 is a central longitudinal section of the construction shown in Fig. 3; Fig. 5 is a section transverse to that shown in Fig. 4, and Fig. 6 is a detail section showing the manner of connecting the overflow valves with the shaft for operating the same.

Similar reference numerals indicate like parts in the several figures of the drawing.

The numeral 1 represents a dredge scow or boat of any ordinary construction, and 2, 2, etc., a series of any desired number of what are well known as "pockets," rising from the bottom of the scow or boat and extending a sufficient height above the deck of the boat, and formed with what is known as a coaming 3, provided with overflow channels or pipes 4, which, when desired, are closed by hinged or flap valves 5, operated in the manner hereinafter described.

The numeral 6 is designed to simply represent the means by which the water admitted with the solid material is delivered by means of a centrifugal pump (deemed not necessary to show) to a trough 7 suitably mounted and supported above the several pockets 2. As each pocket is filled, a drop valve 8, controlled by a wire cable 9 and operated by a cable 11, is caused to close the delivery of the water and solid material to the pocket 2 immediately beneath the same, and the material is then permitted to enter the next succeeding pocket. The water and solid matter is delivered to each pocket through a tube or conduit 12, to which is vibratively connected by a bolt 13, or in any suitable manner, a conveyor 14, which extends a short distance below the upper extremity of the coaming 3 of the pocket, and surrounding and telescoping movably with reference thereto, is a secondary conduit 15, which is raised and lowered by means of cables 16 connected to a shaft 17 in the same manner that the overflow valves are connected with their operating shaft, as shown in Fig. 6. The shaft 17 is operated by means of a shaft 18 and hand-wheel 19 and gearing 20 and 21, and the shaft 18 is held against reverse rotation by a ratchet 22 and pawl 23.

As the silt or solid material accumulates and rises within the pockets, and the depth is determined by sounding or otherwise, the telescopic conduit 15 is raised according to a scale 24, on the vibrative conduit 14. (See

Fig. 3.) The vertical movement of the telescopic conduit is guided through the medium of cables 25, a cross head 26 and pulleys 27 in an obvious manner.

The numeral 28 represents a vibrative brake, by which the downward movement of the telescopic conduit 15 is controlled when the pawl 23 is released from the ratchet 22. The vibrative connection between the conduit 14 and the conduit or tube 12 is designed to accommodate the delivery conduits to any sea vibration of the dredge, and to dispense with the present expensive flexible connection, consisting of a rubber tubing.

The coaming of each pocket is provided on each side with the flap valves 5, which are opened and closed by means of wire cables 29 connected to the bottom extremities of said valves, and to shafts 30 operated by a hand-wheel 31, at one end of which shafts is a ratchet 32, with which a pawl 33 meshes when the valves 5 are to be held in open position.

The pockets 2, in so far as the means for emptying the same, are substantially the same as at present constructed, and I have not deemed it necessary to show such means.

While I have shown and described an apparatus which I have especially designed to carry out my novel method and which constitutes the subject matter of a divisional application, I desire it to be understood that other apparatus may be employed in carrying out my improved method which embodies the generic principle in a self-contained dredging machine of delivering the solid material mixed with water, initially at the bottom of the pockets or receptacles and then immediately adjacent to the accumulations of the same, in contradistinction to delivering the same in such manner as to depend upon the law of gravity for depositing and accumulating the solid material.

Having described my improved method, what I claim as new and desire to secure by Letters Patent is,

1. The method herein described of removing and recovering solid matter from the bottom of waterways which consists in first disturbing the solid matter and mingling it with the overlying water and then delivering the commingled bodies primarily at the bottom of a suitable receptacle upon a floating dredge and then successively close to the accumulating body of solid matter in said receptacle.

2. The method hereinbefore described of recovering the solid matter removed from the bottom of waterways, which consists in disturbing and mingling the solid matter with the overlying body of water, delivering the water mingled with the solid matter to a receptacle above a series of pockets upon a

dredge and successively loading said pockets with the solid material by delivering the water and solid material in its mingled condition, first at the bottom of each pocket and subsequently close to the accumulating body of solid matter, whereby the solid matter is prevented from floating within the pocket and escaping through the overflow channels.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

STEWART ALBERT GEOGHEGAN.

Witnesses:

CHAS. M. BIRCKHEAD,
EDWIN D. BARKER.

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