W. H. SEWARD.

Dredging Apparatus.

No. 226,557. Patented April 13, 1880.

Fig. 1.

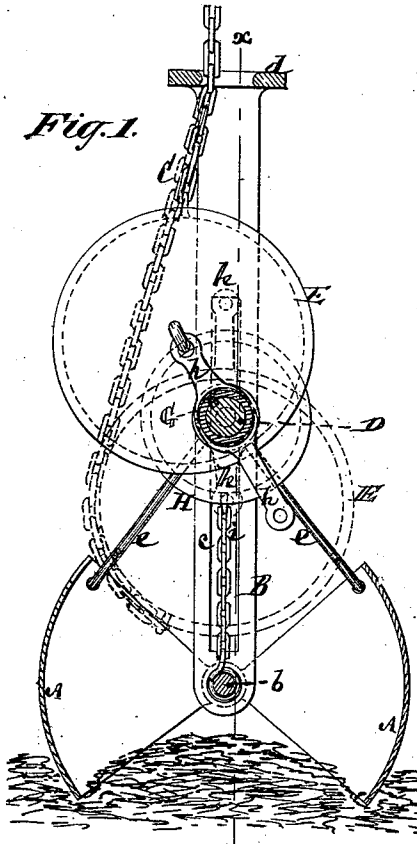


Fig. 2.

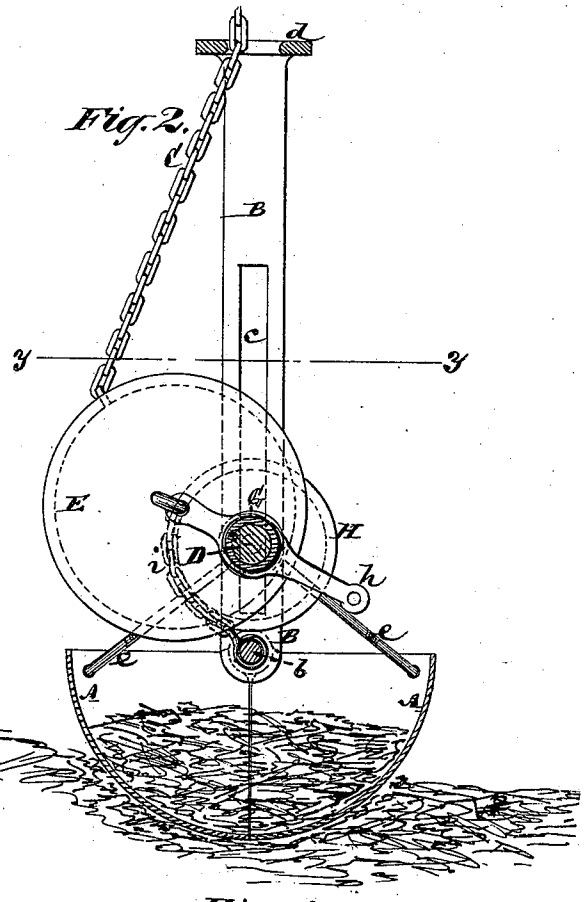


Fig. 3.

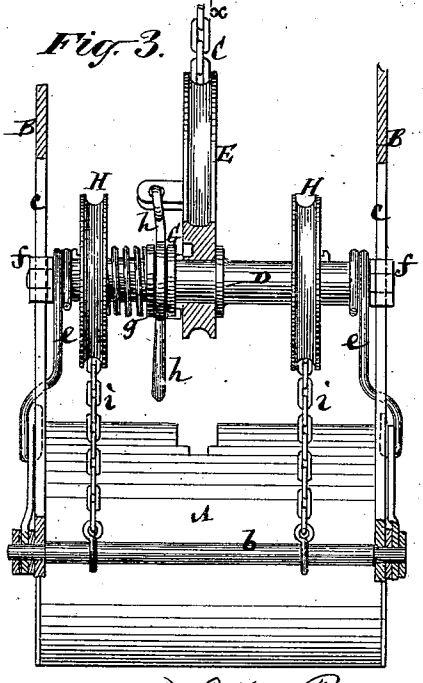
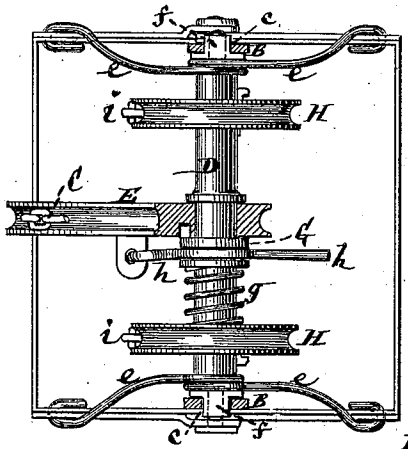


Fig. 4.



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UNITED STATES PATENT OFFICE.

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DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 226,557, dated April 13, 1880.

Application filed February 19, 1880.

To all whom it may concern:

Be it known that I, WILLIAM H. SEWARD, of the city and county of Albany, in the State of New York, have invented a new and useful Improvement in Dredging, Grappling, and Hoisting Apparatus, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to dredging and grappling apparatus in which opening and closing bucket or grappling sections are pivoted or hinged to a slotted frame and connected by rods with a sliding cross-shaft fitted to work up and down within the slots of said frame, pulleys being provided, with one of which the raising and lowering chain of the apparatus is connected, and others of which have chains attaching them to the bucket or grappling section.

Dredging or grappling apparatus of this description have been variously constructed, the scoops or bucket-sections generally being presented in an open condition to the material to be raised, and by vibration on their hinges inclosing a load, the upper edges of the buckets or bucket-sections being in some constructions attached by links to a pivot-rod, which is fitted to slide in slots of the frame. The general operation, however, is the same in all—that is to say, the bucket-sections, which are lowered in an open condition, are closed to take and lift the load by the combined action of a lifting-chain attached at its lower end to a main pulley controlling other pulleys which have independent chains connecting them with the bucket-sections, the latter, in their turn, being connected by rods with a rising-and-falling shaft in the slotted frame of the apparatus.

This invention consists in a combination of an eccentric pulley for the chain by which the apparatus is raised or lowered and operated, a rising-and-falling shaft, on which said pulley is fitted to turn loosely, and which is free to work up and down slots in the guide-frame that carries the hinged bucket or grappling sections, a clutch arranged to engage said pulley with said shaft when the bucket-sections are in position to take the load, a series of pulleys fast on said shaft and connected with the bucket-sections by chains, and arms connecting the bucket-sections with the sliding shaft, whereby the operation of opening and closing the bucket-sections is facilitated, and a single working-shaft in the pendent guide-frame suffices.

Figure 1 in the drawings represents a vertical section of a dredging or grappling apparatus in part constructed in accordance with my invention, and having hinged or swinging bucket-sections, which are shown open ready to take the material to be removed and raised, also showing by dotted lines certain parts in position before lowering and closing the bucket-sections. Fig. 2 is also a vertical section of the like parts or devices, showing the bucket-sections as closed on the material to be removed, and with the working parts in position for raising the grappled substance prior to discharging or delivering the same. Fig. 3 is a vertical section of the apparatus on the line *x x*, Fig. 1, and Fig. 4 a horizontal section thereof on the line *y y*, Fig. 2.

A A represent the bucket-sections or grappling devices, pivoted at their inner upper ends, as by a cross-bar or connection, *b*, to a frame, B. This frame consists of upright arms or sides, having longitudinal slots *c c* in them, and connected by a cross-bar, *d*, through which the raising and lowering chain C passes to any suitable raising and lowering apparatus, or to a derrick or other pulley or means for carrying and working the bucket-sections or grappling devices.

The outer upper ends of the bucket-sections or grappling devices are connected by rods *e e* with a cross-shaft, D, having its bearings in boxes *f f*, which are free to slide up and down within the slots *c c* in the upright arms or sides of the frame B.

The bucket-sections or grappling devices A A may either be of a close or open construction, according to the purpose for which they are designed. In some cases they may be of a simple prong-like or bar construction; but they are here represented as of a close form or build.

Loose on the upper cross-shaft, D, is a grooved eccentric pulley, E, connected with which is the raising and lowering chain C. This eccentric pulley is coupled and uncoupled when necessary, as hereinafter described, by a

sliding clutch, G, with and from the shaft D, by means of a spring, *g*, and a clutch arm or lever, *h*, arranged to control said clutch. Fast on the shaft D are chain-pulleys H, connected by chains *i* with the connection or cross bar *b* of the grappling devices A A.

These several parts are adjusted in relation with each other to secure the following operation: The apparatus is first lowered by the chain C with the bucket-sections or grappling devices A A open, the clutch or engaging and disengaging device G, which may be of any suitable construction, being released from its engagement with the eccentric pulley E, which then assumes the position represented for it by full lines in Fig. 1. As the chain C continues to be paid out after the open bucket-sections have come to a state of rest, the loose eccentric pulley E falls to the position represented for it by dotted lines in said Fig. 1, and the clutch G automatically engages with said eccentric pulley. An upward pull or draft is then made upon the chain C, which causes the locked eccentric pulley E, its clutch G, the shaft D, and pulleys H H all to turn in concert; and by the winding of the chains *i* on the pulleys H H the shaft is lowered to the position represented for it in Fig. 2, and the bucket-sections A A are closed, the locked eccentric pulley E being turned to a side position again, as shown in said figure, but not being fully turned, in order that it may continue its hold on the bucket-sections to keep them closed during the elevation of the bucket. The clutch G is then released by means of a guy rope or chain applied to the lever *h*, when the bucket-sections open and drop in connection with the frame of the apparatus. This causes the shaft D to occupy its former raised position relatively to the slot *c*, and the eccentric pulley E to have its upward turn completed and to assume its normal position, as shown by full lines in Fig. 1.

By means of the eccentric arrangement of the pulley E and the clutch G a rapid and automatic engagement of said pulley with the shaft D is caused when the bucket-sections are at rest on or in the material to be raised, to provide for the lift of the load by the bucket-sections when the chain C is drawn upon for the purpose, and equal facility is afforded by releasing the clutch for liberating the load after it has been raised and for holding the bucket-sections open to commence a fresh descent. A fixed or supplementary pulley-shaft also is dispensed with, the vertically-sliding shaft carrying the several pulleys and clutch or engaging and disengaging device.

A segmental-shaped lever might be substituted for, and would be the equivalent of, the eccentric pulley E, inasmuch as the chain C never fully encircles said pulley.

I claim—

The combination, with the hinged bucket-sections or grappling devices A A, and with the pendent guide-frame B and sliding cross-shaft D, of the eccentric pulley E, arranged loose on said shaft, and having the raising and lowering chain attached to it, the clutch or engaging and disengaging device G, the pulleys H, fast on the shaft D and connected by chains with the bucket-sections, and the rods or arms *e*, connecting the latter with said sliding shaft, substantially as shown and described.

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