T. L. LEE.

Dredging-Machine.

No. 204,584. Patented June 4, 1878.

Fig. 1.

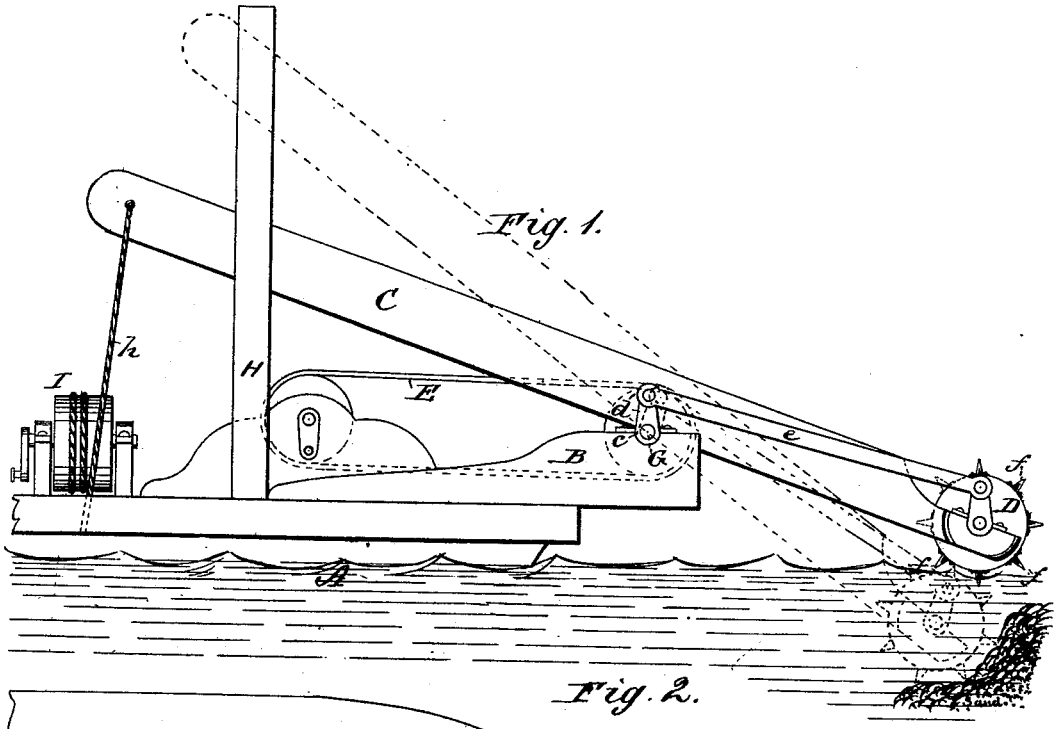


Fig. 2.

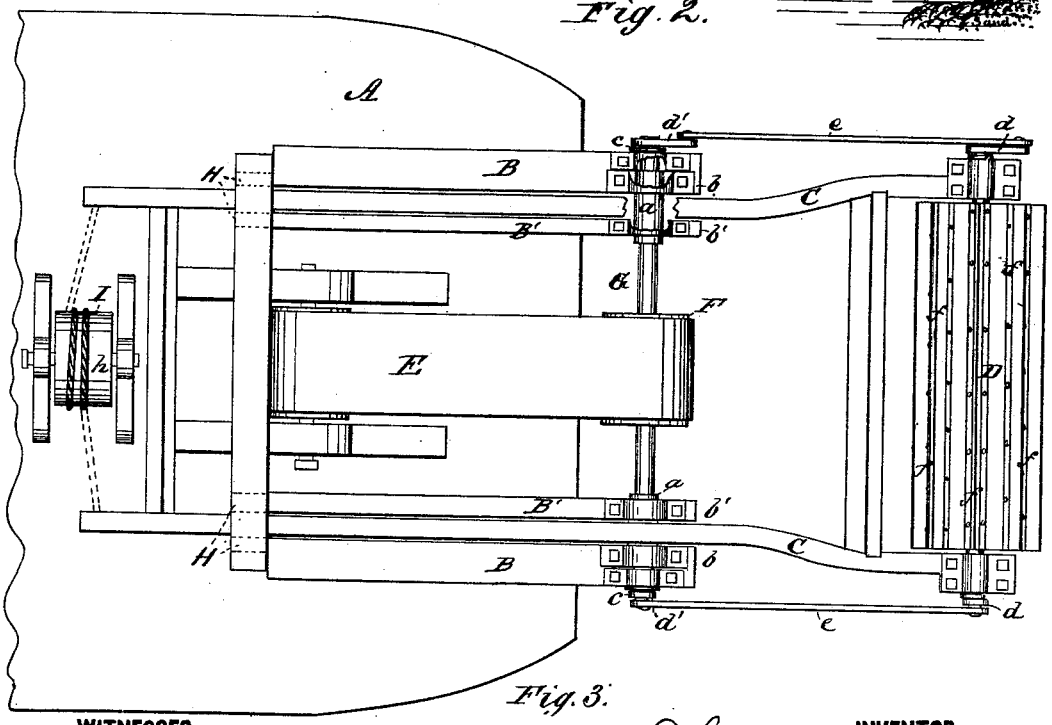
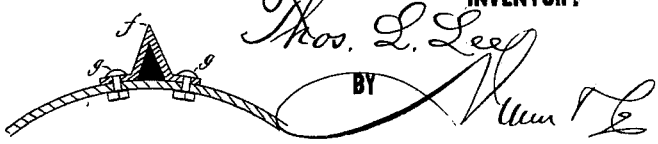


Fig. 3.



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THOMAS L. LEE, OF PADUCAH, KENTUCKY.

IMPROVEMENT IN DREDGING-MACHINES.

Specification forming part of Letters Patent No. **204,584**, dated June 4, 1878; application filed February 20, 1878.

To all whom it may concern:

Be it known that I, THOMAS L. LEE, of Paducah, in the county of McCracken and State of Kentucky, have invented a new and Improved Dredging-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side, and Fig. 2 a plan, view; Fig. 3, a detail of the cylinder-blade.

The object of my invention is to provide a machine for dredging or cutting sand and gravel bars usually found in such rivers as the Ohio and Mississippi and their tributaries, and for deepening and widening the channels of the same by loosening and lifting the sand, so that it may be carried by the current from the shoal places and deposited in the deeper pools, thereby creating a uniform depth of water.

It may also be of great value, and is designed to be used, in removing temporary deposits in harbors where there is a natural current; also, in leveling the bottom of jetties, or for obtaining at the bottom of the river a level and solid base, on which to sink cribs, &c., for the construction of permanent dams.

The invention consists in the particular construction of the dredging-cylinder, having a body constructed in the form of an elongated shell, with longitudinal blades arranged upon the periphery of the same, so as to operate laterally upon the mud and sand, thus beating the same so as to mix it with the water, without overcharging the latter with a greater burden of the mud than it can successfully carry off.

The invention also consists in the arrangement of the drive-shaft with the frame carrying the dredging-cylinder, which frame is pivoted near its middle, and the drive-shaft is arranged concentrically with its said pivots, so that not only a greater leverage is obtained in raising and lowering the dredging-cylinder, but the driving-shaft is arranged closer to the work to be performed, and is in line for operating for all positions of the frame. The frame being partly balanced, also, by the location of pivots, it is made more sensitive in automatically receding from and riding over obstructions when the cylinder in its rotation strikes a snag or rock.

The invention also further consists in other details of construction, hereinafter more fully described.

In the drawing, A represents a portion of the deck of a boat to which my dredging devices are applied. B B′ are pillow-blocks supported upon the same, and forming bearings for the lever-frame and driving-shaft. C is the lever-frame, consisting of two bars connected by cross-bars in front and rear, and carrying in bearings in its forward end the dredging-cylinder D. This lever-frame is fulcrumed near its middle upon elongated hollow bearings or tubular shafts *a a*, which are supported in bearings *b b′* of the pillow-blocks B B′. The lever-frame is thus free to move up or down upon the fulcrum, either to immerse the cylinder or lift the same from the water. If, therefore, the dredging-cylinder should strike a log or other obstruction, the frame yields and tilts upon its fulcrum, instead of breaking the operating parts.

Instead of having the lever-frame moved upon the tubular bearings *a a*, the tubular bearings may be permanently fixed to the frame, and their projecting ends made to form journals or trunnions for the same, which tilt with the frame upon the bearings in the pillow-blocks.

To rotate the dredging-cylinder a belt, E, is made to communicate power from an engine to a drum or pulley, F, fixed on the shaft G. This shaft is made of a less diameter than the hollow bearings *a* of the lever-frame, and, after passing concentrically through the same, is supported in independent outside bearings *c* on the pillow-blocks B.

A doubly advantageous result is secured by this arrangement. In the first place, the effect of the drive-shaft is imparted to the cylinder irrespective of the position of the same and the inclination of the lever-frame; and, furthermore, the driving-shaft at its bearing is relieved of the weight and frictional strain of the lever-frame and cylinder, the latter being supported upon the elongated tubular bearings *a*, in which the drive-shaft loosely revolves.

In connecting the drive-shaft to the cylinder for the rotation of the latter, various well-known devices may be employed.

As shown, I have arranged upon opposite ends of the drive-shaft, and opposite ends of the cylinder, cranks *d d' d'*, which are connected by pitmen *e e*. In the place of these devices, however, I may use a chain-belt and pulleys, right-angularly arranged shafting with bevel-gears, or other suitable devices for accomplishing the same result.

In constructing the cylinder D, it is to be provided with a series of knives or blades, *f*, arranged parallel or otherwise, and continuous throughout the whole length of the cylinder or in sections. These blades are made either hollow or solid. In transverse section they are V-shaped and have flanges at the base to fit the periphery of the cylinder, to which they are fastened by bolts *g* passing through said flanges. These blades are designed to be of about six or eight inches in depth, and are especially well adapted to the work required of them, for the reason that the V shape braces and strengthens them, while the bolts permit them to be easily removed when broken or worn out and new ones substituted.

As to the construction of the body of the cylinder, an ordinary boiler, with flues taken out, may be readily adapted to the purpose by putting in strong heads and riveting or bolting the journals to the same, an opening or man-hole being left for access to the interior in securing or removing the bolts of the knives.

To steady and strengthen the lever-frame against lateral shocks or abrasion, the rear ends of the side bars are arranged in braced guide-posts H.

The machine may be made wholly of iron, or of wood and iron, the strength of the device to be governed by the character of the work for which it is intended.

To raise and lower the cylinder, a drum, I, is fixed upon the boat, and is rotated by an engine to wind or unwind a cable, *h*, and thus tilt the lever-frame upon its pivots.

The cylinder and operative parts of the machine are driven by another engine, connected to the shaft to which the driving drum or pulley is fixed, the steam to be taken from the same boilers that supply the engine which propels the vessel to which the machine is attached. The vessel best adapted for this purpose is a square-stern side-wheel boat, the machine to be attached to the stern of the same.

By this mode of dredging the sand-bars are rapidly cut up, and the particles, being put in suspension in the water, are rapidly carried out of the way, thus avoiding the cumbersome and laborious step of lifting and loading the mud and sand into receptacles and then hauling the same away.

I am aware that a dredging-cylinder composed of a series of circular saws has been located and operated at the bottom of a frame swung on pivots at its forward end concentric with the drive-shaft; but in such case, the frame not being pivoted in the middle, there is not only a great disadvantage of leverage, but the drive-shaft is far removed from the dredging-cylinder.

I am aware, also, that a form of lever-frame similar to mine—*i. e.*, pivoted in the middle—has been employed in dredging-machines in connection with a scoop and tackle for operating the same; but there is here no drive-shaft concentric with its pivots, and no rotating dredging-cylinder to co-operate with a sensitively-balanced frame in receding from or riding over obstructions. I therefore do not claim, broadly, a rotating dredging-cylinder, nor a centrally-pivoted frame; but

Having thus described my invention, what I claim as new is—

1. A dredging-cylinder composed of a hollow elongated shell, provided with longitudinal beating blades or knives, flanged at their base and secured to the periphery of the cylinder by screw-bolts, as described.

2. The combination, with the lever-frame, fulcrumed at or near the middle and carrying a revolving cutting-cylinder at its outer end, of the drive-shaft arranged concentrically with the pivots of the lever-frame, as and for the purpose described.

3. The combination, with the lever-frame pivoted near its center, and a drive-shaft arranged concentrically with said pivots, of a tubular bearing arranged to sustain the weight of the frame, and an independent concentric bearing arranged to support the drive-shaft, substantially as described.

4. The combination of the cylinder D, centrally-fulcrumed lever-frame C, drive-shaft G, pitman *e*, cranks *d' d'* or their equivalents, guide-posts H, drum I, and cable *h*, substantially as and for the purpose described.

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