2 Sheets—Sheet 1.

T. M. JONES.

Dredging-Machine.

No. 206,575. Patented July 30, 1878.

Fig. 1.

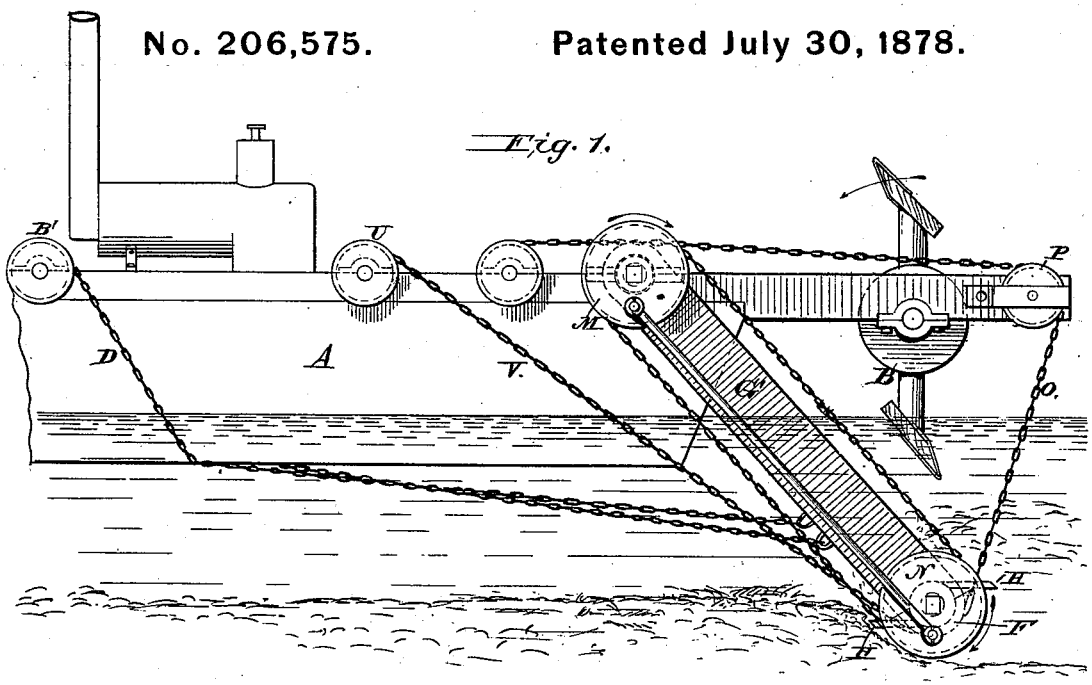
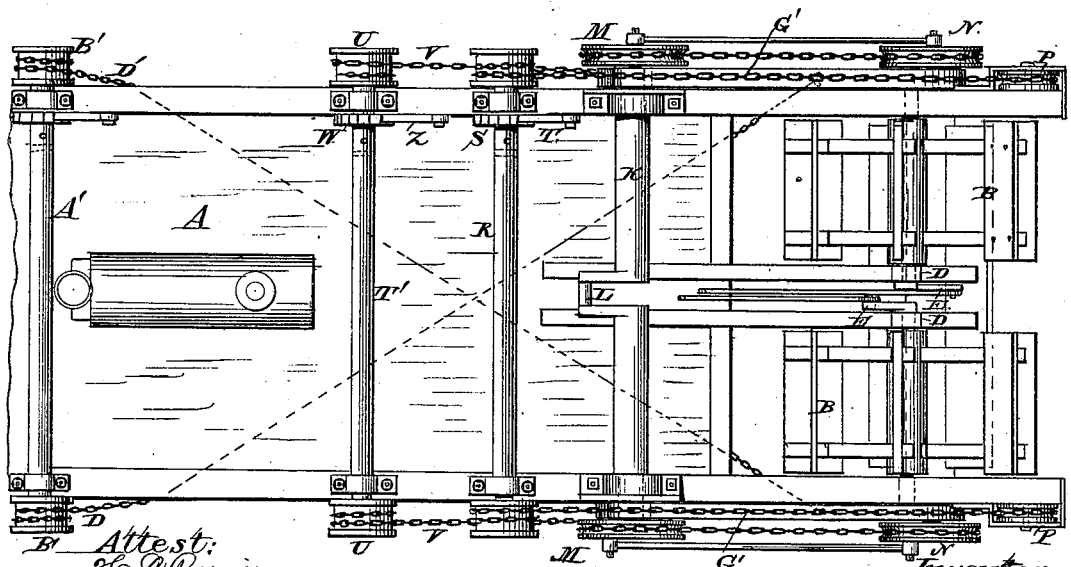


Fig. 2.



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2 Sheets—Sheet 2.

T. M. JONES.

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Fig. 3.

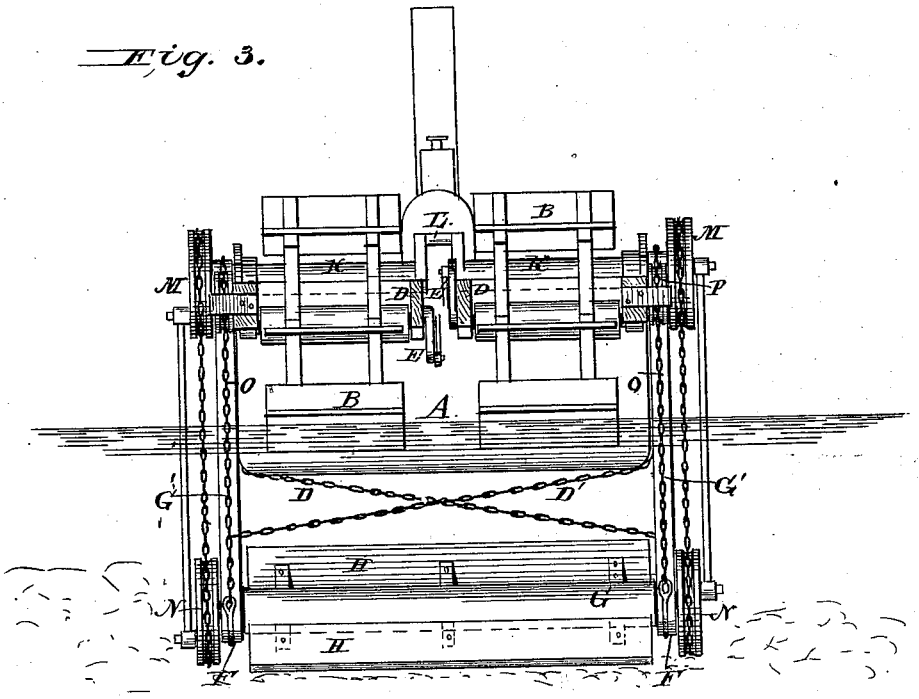


Fig. 4

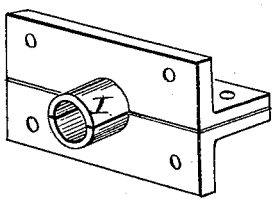
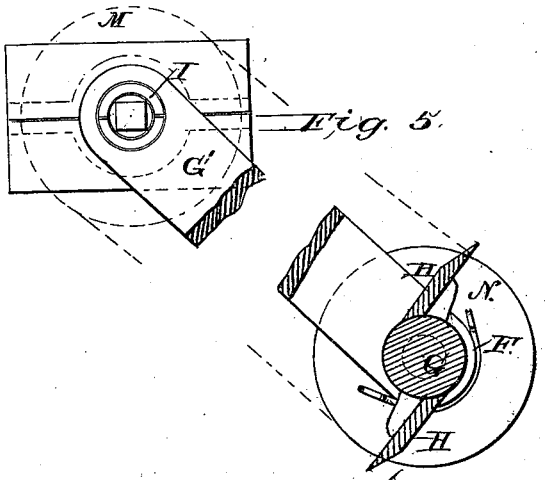


Fig. 5.



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UNITED STATES PATENT OFFICE.

THOMAS M. JONES, OF KANSAS CITY, MISSOURI.

IMPROVEMENT IN DREDGING-MACHINES.

Specification forming part of Letters Patent No. **206,575**, dated July 30, 1878; application filed June 13, 1878.

To all whom it may concern:

Be it known that I, THOMAS M. JONES, of Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Current Excavating-Dredges, of which the following is a specification:

This invention relates to an improved current excavating-dredge or machine for cutting up and loosening and throwing up into the natural current, or current caused by suitable mechanism, for removal by said current, the earth or deposit at the bottoms of rivers, harbors, &c.

My invention consists, first, in the combination, with a boat, barge, or other floating structure, of a paddle-wheel provided with a series of paddles or floats, beveled from the rear to a sharp front edge, and set at an angle of about fifteen degrees to the diameter of the circle in which they rotate, and a dredging-wheel supported from the boat by a hinged frame, and provided with blades inclined at an angle to its diameter, whereby the current of water and earth thrown up by the dredging-wheel is carried to the rear, substantially as specified; second, in the combination, with the dredging-wheel and its operating mechanism, of the paddle-wheels by which the boat or structure is propelled, the two being so arranged relatively that the current established by the paddles of the propelling-wheels will assist in carrying off the earth or deposits thrown up by the dredging-wheel, as more fully hereinafter specified; third, in the combination, with the arms which carry the dredging-wheel, of two chains, ropes, or cords, extending from or near the ends of said arms or beams diagonally under the bottom of the boat or structure to drums or windlasses mounted, at opposite sides of the said boat or structure, on a shaft extending across the same, whereby the dredging-wheel and its arms may be rigidly braced in any desired position, as more fully hereinafter specified.

In the drawings, Figure 1 represents a side elevation of a boat, showing my improved dredging mechanism. Fig. 2 represents a top view of the same. Fig. 3 represents a rear elevation of said boat, and Fig. 4 represents a detached sectional view of the hollow gudgeons.

The letter A represents the sides of the boat, barge, or other floating structure which carries the working parts of the dredging-machine. At the stern of said boat is located the propelling mechanism, consisting, preferably, of two paddle-wheels, B B, extending transversely across the boat, and journaled independently of each other in bearings D D at the center of the boat and at each side of the boat, respectively. The paddles of said wheels are constructed of wrought-iron or wood plated with iron or other metal, and are beveled from the rear to a sharp front edge, so as to cut into the water with facility. Said paddles are set at an angle of about fifteen degrees to the diameter of the circle in which they rotate, so as to enter the water at an angle, with the edge foremost, and not horizontally, with the side foremost, as is the case when they are arranged radially, as is customary. By this means they are caused to more readily enter and take hold of the water, and will establish a horizontal current toward the rear, near the surface, instead of establishing a current toward the bottom, as would be the case if they were set radially, as customary, which would counteract the ascending current established by the dredging-wheel, which would materially interfere with the effective operation of the apparatus. Two or more of said paddles are employed, and they are preferably mounted upon radial spokes extending from the shaft of the wheel, so as to leave a space for the passage of the water forward and relieve the wheels of some of the strain caused by their rotation in the water, and to enable them to be set deeper in the same. The adjoining ends of the shafts of said wheels, at the center of the boat, are provided with independent cranks E E, connected by pitmen with the piston-rod of an engine or other motor, so that they can be rotated simultaneously in one direction separately, or in opposite directions, to facilitate turning in narrow streams in the same manner as a side-wheel boat.

By thus connecting the motor with the journals of the wheels at the center of the boat the cranks usually employed at the sides are rendered unnecessary and are dispensed with, giving the dredging machinery, hereinafter described, full and free play.

The letter F represents the dredging-wheel, which consists of a drum, G, journaled in the ends of two arms or beams, G′, at each side of the boat, and provided with two or more sharp-edged blades, H, set at an angle to the diameter of the drum in such manner that as the drum is rotated the blades will penetrate the bottom of the stream or body of water, and excavate and throw the earth and deposits upward into the current at the surface of the water. The arms G′ are journaled at their upper ends to the hollow gudgeons I, which are secured to and project beyond the sides of the boat for the purpose.

The letter K represents a transverse shaft extending through and journaled in said gudgeons, and provided with a crank, L, connected by a pitman to any suitable motor. Each end of said shaft is provided with a grooved drum or sprocket-wheel, M, from which extends an endless band, cord, or chain to a similar wheel, N, mounted on opposite ends of the journals of the dredging-wheel.

It will be seen that as thus constructed the driving-shaft K is relieved of all strain of the dredging-wheel when cutting into the soil, which is important, as the tremendous force exerted would otherwise cause great friction on said shaft and tend to throw it out of line or break, bend, or otherwise injure it. The shaft K, through the medium of its drums or sprocket-wheels and the endless bands, ropes, or chains, imparts the proper motion, in the direction of the arrows, to the dredging-wheel.

To each end of the arms G′ are secured chains O, passing upward over pulleys P and forward to the drums on the shaft R, journaled in bearings at opposite sides of the boat. Said shaft is provided with a ratchet-wheel, S, into which engages a pawl, T, by means of which it may be held in order to secure the dredging-wheel at any angle of elevation, said wheel being elevated by rotating said shaft R, so as to wind the chains thereon.

The letter T′ represents a transverse shaft journaled in bearings at each side of the boat, and provided with drums U U on opposite ends. From these drums extend the chains V V to the lower ends of the arms G′, in which the dredging-wheel is journaled. Said shaft T′ is provided with a ratchet-wheel, W, and pawl Z, by means of which it may be held in order to secure the dredging-wheel in position to properly enter and throw up the earth or deposit from the bottom of the stream or body of water.

The letter A′ represents a transverse shaft, similar to the shafts R and T′, and journaled in the sides of the vessel on a horizontal line with said shafts. Said shaft A′ is provided with drums B′ B′, from which extend chains D′ D′ diagonally under the bottom of the vessel to the ends of the arms G′, to which they are secured. The object of these chains is to form a brace to said arms when drawn tight, so as to secure the said arms and the dredging-wheel rigidly in place at any desired elevation and prevent any lateral movement, in order to confine the dredging-wheel to the channel as the boat or vessel progresses.

The shaft of the dredging-wheel is preferably constructed of cast-iron, with radial lugs beveled at a tangential line to the periphery of the shaft for the reception of the blades, which are constructed, preferably, of metal and removably secured to the tangential beveled faces of the lugs, so that they may be readily removed and replaced when injured. Two or more of said blades may be employed, the two diametrically opposite each other, with the shaft or journal having an approximately **S**-shaped cross-section, by means of which the blades are better adapted to excavate and throw up the earth, muck, sand, gravel, or other deposits usually formed at the bottoms of streams and bodies of water.

The pulleys on the driving-shaft which actuate the pulleys on the shaft of the dredging-wheel should be made considerably larger than the pulleys on said dredging-wheel in order that the revolutions of the latter may be multiplied so as to give the dredging-wheel a rapid rotary movement. The pulleys on the dredging-wheel should be made smaller in diameter than said wheel in order to permit said dredging-wheel to readily sink in the hard-clay bottoms of some streams or bodies of water as well as in the soft sand or muck at the bottom of other streams, so as to allow the excavating-wheel to enter the same and operate thereon, unless a crank is substituted for said pulleys on the dredging-wheel.

The operation of my invention will be readily understood in connection with the above description.

The boat is propelled through the water by means of the paddle-wheels, the dredging-wheel being lowered to the bottom of the stream. As the dredging-wheel is rotated the earth, muck, gravel, sand, and other deposits will be thrown into the current at the surface of the stream or body of the water. The current established by the paddle-wheels will operate in conjunction with the natural current to carry the earth down the stream or to the rear of the boat, thus materially assisting in its removal.

My invention is applicable to all dredging and ditching purposes, such as cleaning out channels, cutting across sand-bars in rivers, turning channels of rivers, cutting through bars at the entrance of harbors, and also clearing harbor-channels with the outgoing tide.

What I claim is—

1. In combination with a boat, barge, or other floating structure, a paddle-wheel provided with a series of paddles or floats, beveled from the rear to a sharp front edge, and set at an angle of about fifteen degrees to the diameter of the circle in which they rotate, and a dredging-wheel supported from the boat by a hinged frame and provided with blades inclined at an angle to its diameter, whereby

the current of water and earth thrown up by the dredging-wheel is carried to the rear, substantially as specified.

2. In combination with the dredging-wheel and its operating mechanism, the paddle-wheels by which the boat is propelled, said dredging and paddle wheels being so arranged relatively that the current established by the paddles of the propelling-wheels will assist in carrying off the deposits thrown up by the dredging-wheel, substantially as specified.

3. In combination with the arms which carry the dredging-wheel, the chains extending from or near the ends of said arms diagonally under the bottom of the boat to the drums on opposite sides of said boat mounted on a transverse shaft, whereby the dredging-machine may be rigidly braced in any desired position, substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

THOMAS M. JONES.

Witnesses:
JAMES L. NORRIS,
JAS. A. RUTHERFORD.