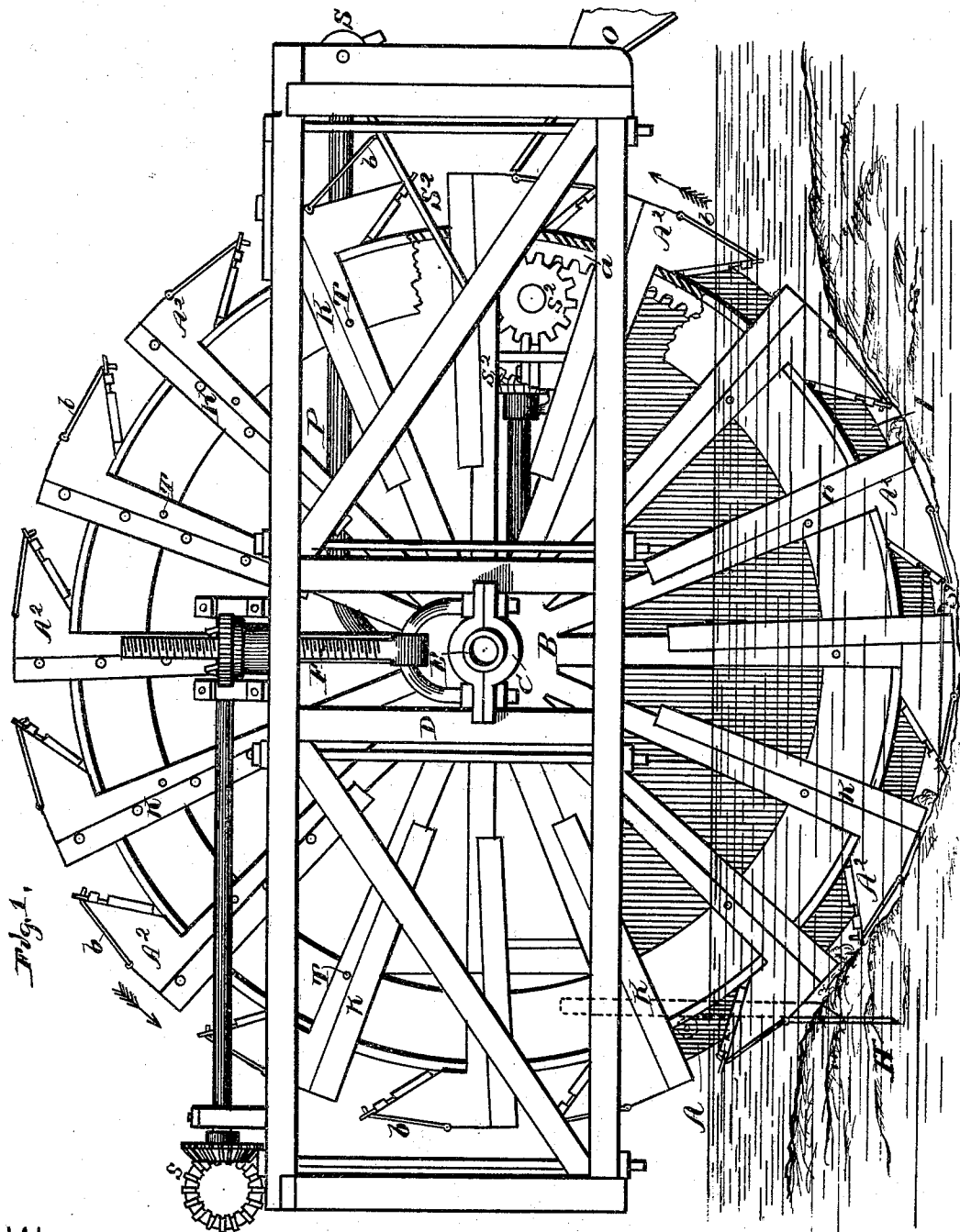


A. HAWLEY.
ROTARY DREDGER.

No. 171,380.

Patented Dec. 21, 1875.



WITNESSES:

Geo. F. Duhamel,
Thomas. Payne.

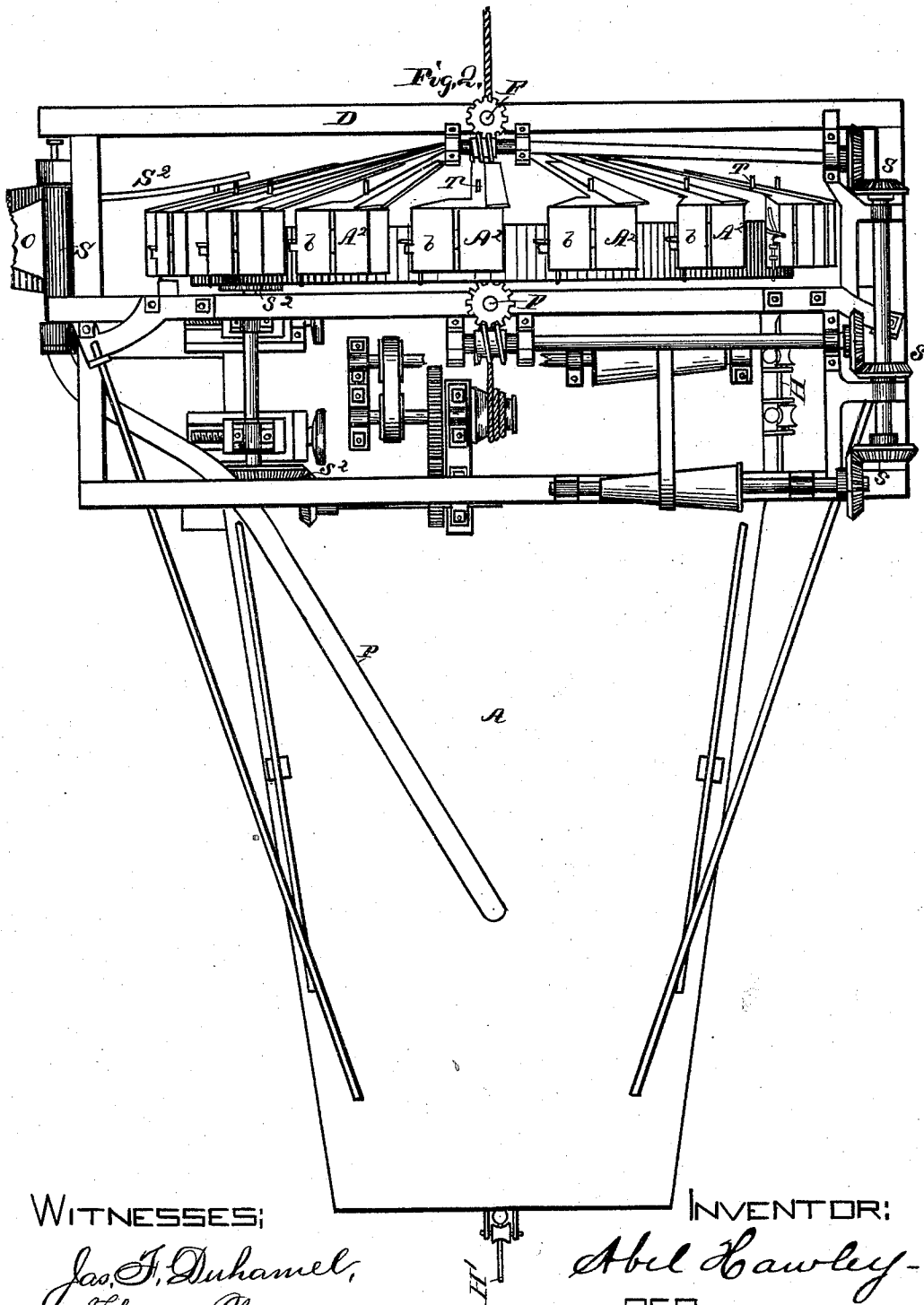
INVENTOR:

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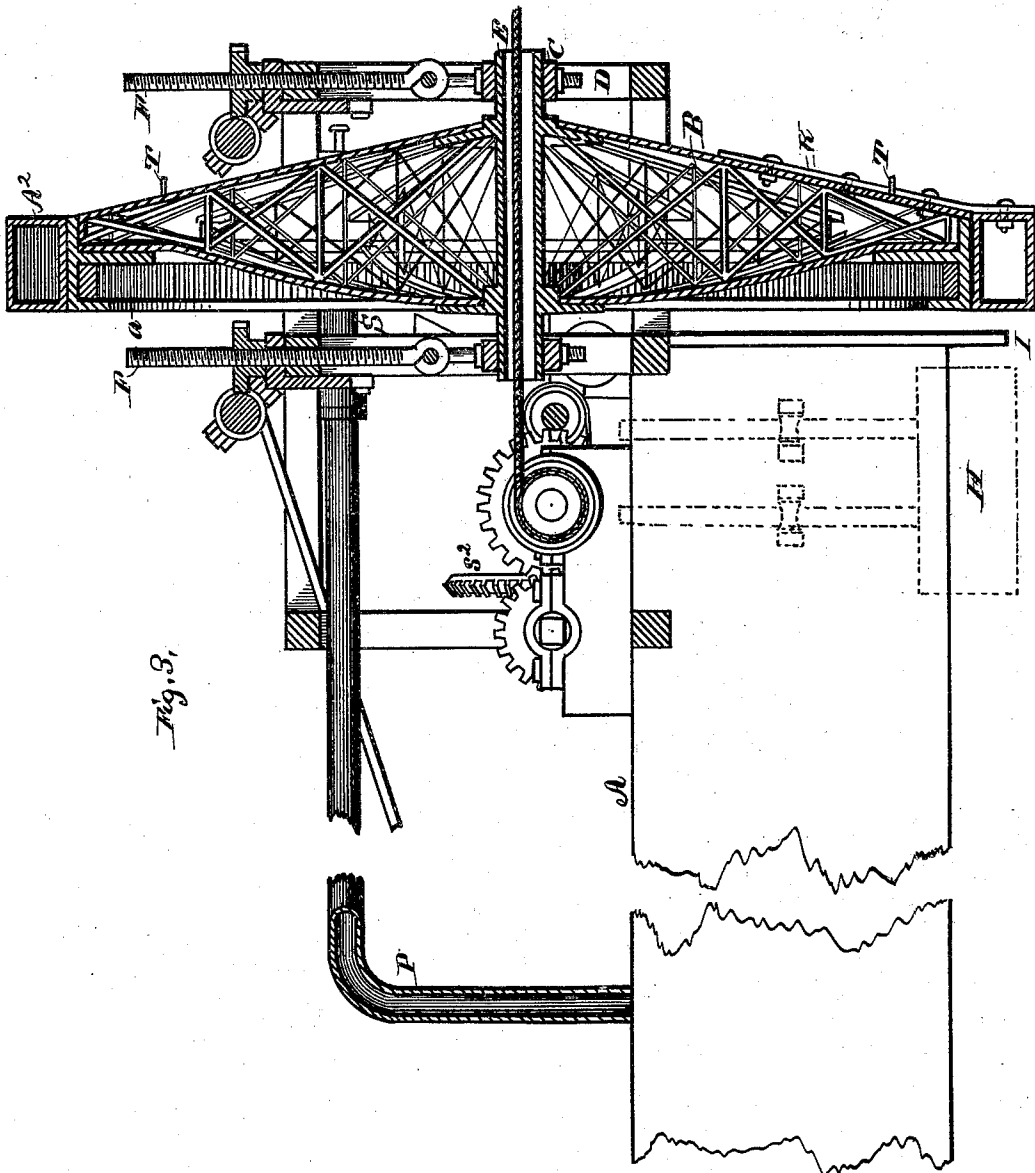
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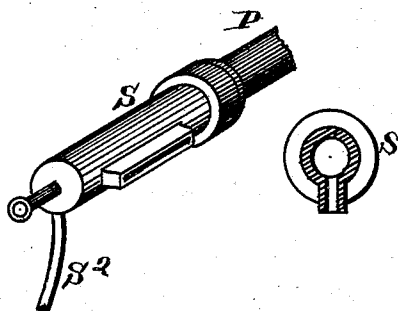
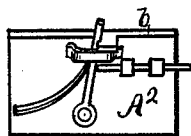
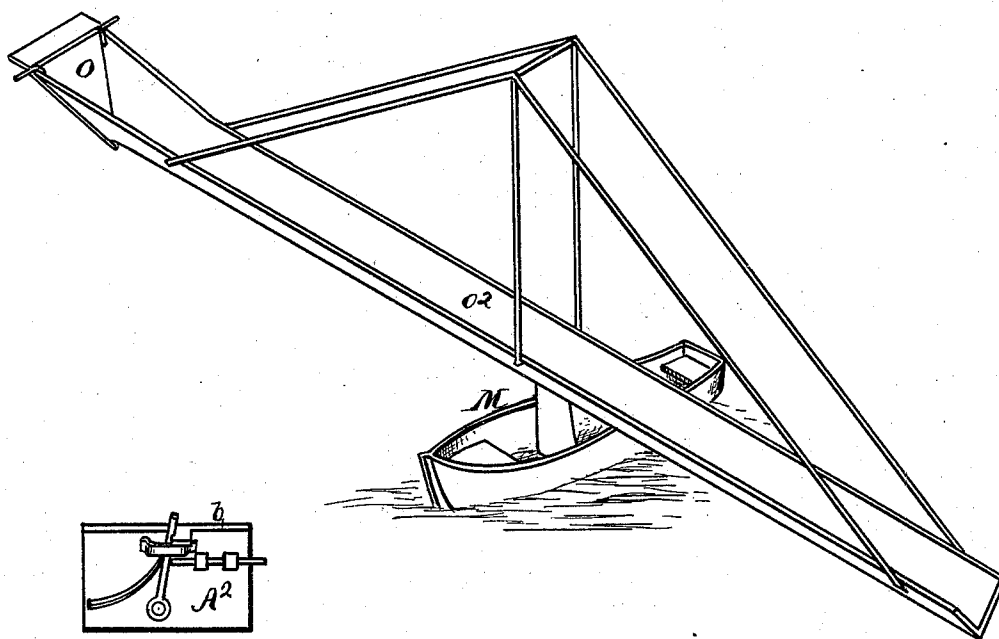
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UNITED STATES PATENT OFFICE.

ABEL HAWLEY, OF GALVESTON, TEXAS.

IMPROVEMENT IN ROTARY DREDGERS.

Specification forming part of Letters Patent No. **171,380**, dated December 21, 1875; application filed December 2, 1875.

To all whom it may concern:

Be it known that I, ABEL HAWLEY, of Galveston, in the county of Galveston and State of Texas, have invented certain new and useful Improvements in Rotary Dredging-Machines, of which the following is a specification:

The dredging-machine constituting this invention consists of a cutting or boring wheel mounted upon adjustable bearings, which are secured in a frame attached to any suitable boat of light draft. The said wheel is provided with knives or cutters bolted to its arms, which arms also carry buckets, into which the mud, sand, or silt cut by the knives falls, and from which buckets the said matter is discharged by the rotation of the wheel. The several details of this invention will now be described.

In the drawing forming part of this specification, Figure 1 is a front elevation of the boring-wheel and frame supporting it. Fig. 2 is a plan of the whole machine. Fig. 3 is a longitudinal section through the boat and wheel. The other figures represent details to be hereinafter described.

In the several figures like letters indicate the same parts.

A is a floating vessel or scow, built in any suitable manner, depending upon the weight or size of the boring-wheel and the necessary machinery for operating said wheel. B is the cutting or boring wheel, mounted in pendent bearings C, which slide in suitable guides in the frame D, which frame is bolted or secured in any suitable manner to the boat A. E is a hollow shaft, forming the journals for the wheel B. The pendent bearings C C are adjusted at such a point above the water-level as is required for the proper submergence of the cutting and scooping parts of the wheel by means of elevating-screws F F, which are turned by an endless screw and lines of shafting and gearing $s s s$, leading to the main engine, situated in any suitable part of the boat. The said engine rotates the wheel B by means of lines of shafting and gearing $s^2 s^2 s^2$, the last pinion of which gearing meshes into the internal gearing a of the wheel B. By passing a line or hawser through the hollow shaft E, and around any drum or shaft operated by

the engine, and attaching the ends of the hawser to anchors or piles both ahead and astern of the boat A, the whole machine can be readily kept up to its work, the engine rotating the wheel, raising or depressing it, and hauling the boat ahead for continuous cutting of the bottom of a channel, and removing either mud or sand-bars therefrom.

I am aware that dredging-machines have heretofore been provided with rotary wheels in bearings adjustable by screws; but by my method of operating the adjustment from the engine through gearing I am enabled to manipulate a heavier wheel than would otherwise be practicable.

The wheel B is made preferably of boiler-plate iron, with its whole frame-work riveted together. The internal gearing a is made of cast-iron circular segments, which are riveted in place to form a full circle. The buckets or scoops A^2 are formed partly triangular in shape, and are riveted to the ends of the arms of the wheel B. The said buckets are provided at their bases with hinged doors b , as clearly seen in the drawing, which doors are fitted with spring-latches, the said latches being released and the doors opened by the impact of the latches against suitable projections fitted at proper points on the frame of the wheel. As the wheel B revolves the doors b close again and latch themselves by their own weight. The knives or cutters K are made of plate-iron, and are bolted to the arms of the wheel B. The said knives can readily be detached and renewed when worn out, or sharpened and replaced at pleasure.

O is a trough, of iron or other suitable material, into which the buckets A^2 discharge their contents. From said trough may lead off from the boat A as far as desired an adjustable sectional trough or pipe, O^2 , which may be supported by a ponton or float, M, and may discharge its contents either overboard or into any suitable floating receptacle, or upon the bank of the stream or levee.

When the contents of the buckets are to be discharged upon a levee, I prefer to use a car upon a track, to be placed upon the levee, for supporting the trough O^2 , and by this means discharge the contents of the buckets upon the land side of the levee. When I use this

car or truck I provide a suitable gearing to connect it with the engine on board of the boat A, by means of which the car is moved forward as fast as the wheel B cuts a channel, and is kept abreast of the boat.

In order to steady my dredging-machine, and hold it upon the correct course, I use my anchors and apron, Letters Patent for which were granted to me August 29, 1848, as will be seen by reference to H, H', and I, Figs. 1, 2, and 3 of the drawings forming a part of this application.

P is a pipe leading from a force-pump situated in any suitable part of the boat A. The said pipe discharges a stream of water through a slotted orifice in its discharge pipe or nozzle S into the buckets A², and thoroughly washes out their contents, forcing such into the trough O. An arm, S², upon the nozzle S, is struck by tappets T upon the arms of the wheel B as it revolves, thus causing intermittent jets of water to descend into each bucket A² as it passes under the nozzle S with sufficient force to thoroughly wash out the bucket through its open door b.

It will thus be observed that when once this machine is put in operation it can be continued at work without intermission, the boring-wheel being fed up to its work like any cutting-tool in a boring-mill. Immense dredging operations can thus be executed, and with the necessary attendance of very few operatives.

Having thus fully described this whole rotary dredging-machine, as of my invention I claim—

1. A rotary dredging-machine consisting of a floating vessel or scow, having mounted thereon a boring-wheel, provided with peripheral buckets and radial knives, said wheel rotated by an engine on board of the machine,

boring in line of its axis by means of said knives as the machine is advanced by its motive power, all arranged and operating substantially in the manner hereinbefore described, for the purposes set forth.

2. The combination of the pendent bearing C C with the adjusting-screws F F and shafting and gearing s s s, substantially in the manner hereinbefore described, for the purposes set forth.

3. The hollow shaft E, forming the journals of the boring-wheel B, whereby said shaft is made to form a convenient warping-chock or hawse-pipe, for the purposes hereinbefore set forth.

4. A boring-wheel provided with radial knives, the said knives being attached to the arms of the wheel, and extending from the outward extremity of said arms to or near the hub of the wheel, for the purpose of cutting in the line of the axis of the wheel, in the manner hereinbefore described, for the purposes set forth.

5. The combination of the wheel B and knives K with the buckets or scoops A², all arranged and operating as described, so that the cuttings of the knives shall fall to the bottom of the ditch and be elevated by the buckets, substantially as set forth.

6. The combination of the discharge-pipe P with the buckets A² and trough O, substantially in the manner hereinbefore described, for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ABEL HAWLEY.

Witnesses:

H. B. BROWN,
JAS. F. DUHAMEL.