(No Model.)

J. BUCHANAN.

Device for Hauling Canal Boats.

No. 239,438. **Patented March 29, 1881.**

Fig. 1.

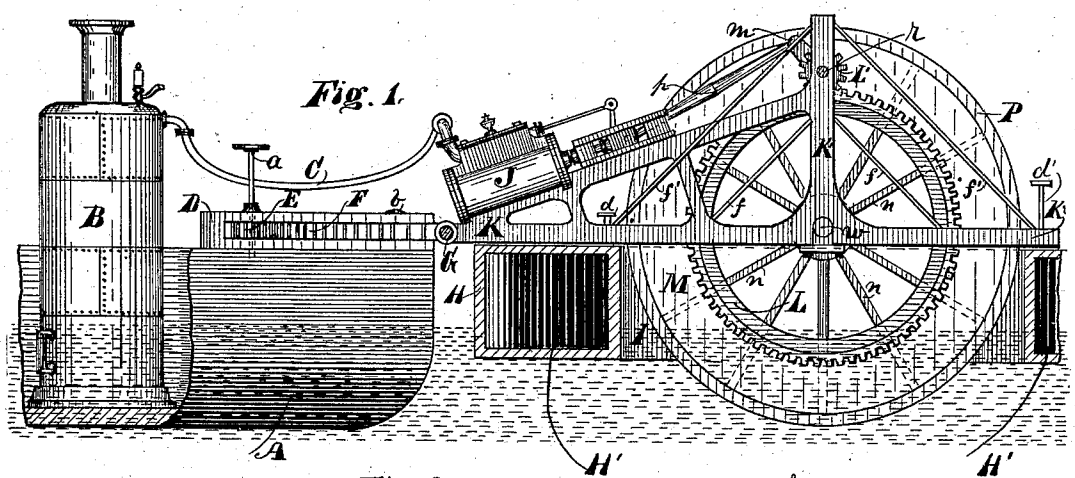


Fig. 2.

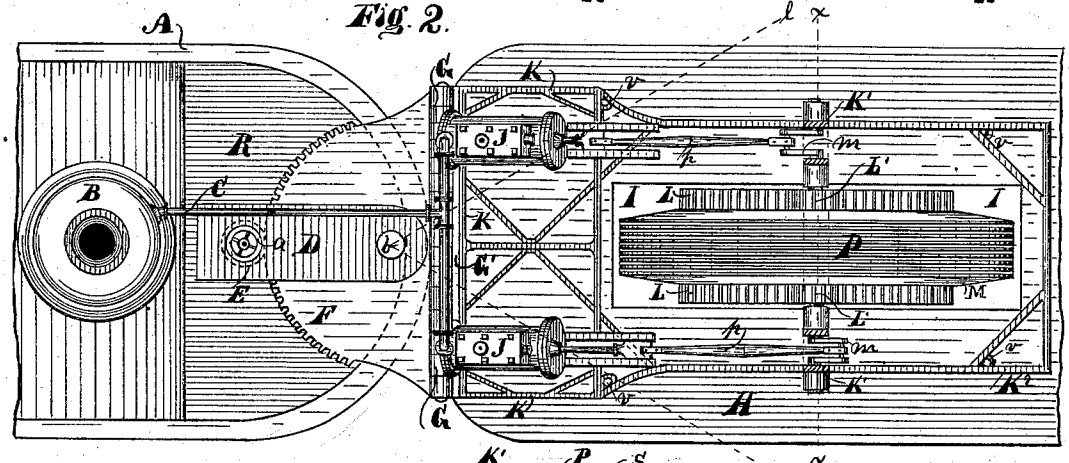


Fig. 3.

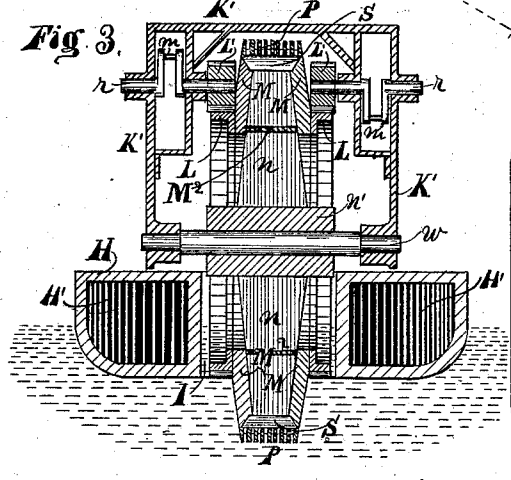
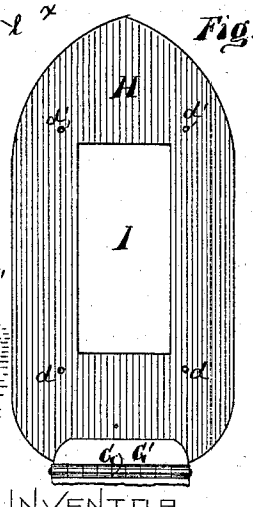


Fig. 4.



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DEVICE FOR HAULING CANAL-BOATS.

SPECIFICATION forming part of Letters Patent No. 239,438, dated March 29, 1881.

Application filed August 25, 1880. (No model.)

To all whom it may concern:

Be it known that I, JAMES BUCHANAN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Device for and Mode of Hauling Canal-Boats, of which the following is a specification.

My invention relates to improvements in apparatus for hauling canal-boats, in which a pair of inclined engines mounted on an adjustable frame, with a combined traction and paddle wheel, operate in conjunction with a float and a tender containing the steam-boiler; and the objects of my invention are, first, to provide a means for supporting and holding in a permanent manner relative to each other the steam-engines and the combined traction and paddle wheel and their operating mechanism; second, to provide a float for supporting the combined traction and paddle wheel, together with the engines and their operative mechanism, when the water is too deep for the traction-wheel to operate on the bottom; third, to afford facilities for the wheel to operate as a paddle-wheel when in deep water, and to give to said wheel traction-power when its periphery comes in contact with and rolls on the bottom of the canal; fourth, to afford a means for lifting the float when the wheel and its frame have been elevated to a certain height by reason of contact with the ground and prevent the float from dragging; fifth, to afford a means for allowing the engines, their mechanism, and float to rise and fall independent of the tender which carries the boiler; sixth, to provide facilities for steering the float which supports the engines and combined traction and paddle wheel from the tender; and, seventh, to afford facilities for hauling boats by a traction or paddle wheel, and at the same time prevent washing the banks. These objects I accomplish by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of the entire apparatus, partially in section to show the construction and arrangement of some of its parts. Fig. 2 is a plan view of the same. Fig. 3 is a vertical cross-section of the combined traction and paddle wheel, together with a portion of its operating mechanism and the float; and Fig. 4 is a plan view of the float.

Similar letters throughout the several views indicate like parts.

A represents the tender or boat, containing a steam-boiler, B, which may be of any approved pattern. The bow of the boat A is provided with a double or forked plate, D, which is securely fastened thereto. In the fork of this plate D is secured a spur-pinion, E, with a rod and hand-wheel *a* for operating it. In front of this wheel E, and also pivoted at *b*, is the large cog-segment F, the teeth of which mesh in gear with the wheel E, by means of which the cog-segment plate F is operated. The front edge of the cog-segment plate F is straight and provided with knuckle-joints, forming, in connection with the plate G′, which is attached to the frame-work of the engine and combined traction paddle-wheel, the hinge-joint G.

The frame-work K K′ K² may be made of any desired form or material adapted to securely hold in place the engine-cylinders J J, the combined traction and paddle wheel P, and their operating mechanism. This frame K is secured to the knuckle-plate G′, and connects with the knuckle part of the cog-segment plate F to form the hinge-joint G, by means of which the whole frame K K′ K², the engine, the paddle-wheel, and their operating mechanism are permitted to adjust themselves, as a whole, to any required position relative to the tender A.

The frame-work K K′ K², the wheel P, the engines J J, and their operating mechanism are all held up and supported by the float-boat H when in deep water. This float H is constructed with a water-tight chamber, H′, all around the central vertical aperture, I. The central vertical aperture or spring, I, is designed for the combined traction and paddle wheel P to operate in. The float H is provided with vertical standards *d d*, which operate in eyes or holes *v v* formed in or attached to the frame K K², by means of which the float is secured to the frame and the frame allowed to rest on the float at all times when the wheel P does not come in contact with the ground; but when said wheel does come in contact with the bottom, the wheel then acts as a traction-wheel, and if it rises up in passing over any obstruction or unevenness of the bottom the whole frame K K′ K², the engines, and their

operating mechanism are also raised up off of the float H by reason of the hinge-joint G until the heads of the uprights *d* come in contact with the frame K K², when the float will also be lifted, so as to prevent its bottom from scraping the ground. In order to do this the heads of the studs *d* are set low enough to raise the float before the lower part of the wheel P is raised above the level of the bottom of the float.

The engines J J are connected with the steam-boiler B by a flexible pipe, C, and the float and its operating mechanism are steered by the hand-wheel *a*, the spur-pinion E, and cog-segment plate F, so that the float can be adjusted either to the right or left, as indicated by the dotted lines *l l*, Fig. 2.

The rim of the combined traction and paddle wheel P is composed of flat iron rings secured together, forming an open face of any desired width. These iron rings are also secured to shoes S, attached to the outer ends of the wheel-spokes *n*, the inner ends of said spokes being secured in the usual manner to the hub *n'*, which is mounted on the shaft *w*, which is supported in suitable bearings formed in the side frames, K K'. The sides of the wheel P are usually made open; but when muddy bottoms are to be encountered the sides are formed of annular plates M M, which plates, if used, are secured to the spokes *n'* and tread of the wheel in an inclined or wedge-shaped position, as shown in Figs. 2 and 3, and the tread made solid. These side plates, if used, close up the sides of the wheel for a distance of nearly two feet, and are provided with an inner lining, M², which forms an air and water tight annular ring around the wheel, to prevent mud and dirt from getting inside, and leaving a large opening in the center. On each side of the wheel P, and secured to the spokes *n*, are the rims of two large spur-wheels, L L, and above these wheels L L are their respective spur-pinions L' L', each wheel L' being mounted on a crank-shaft, *r*, and said crank-shaft supported in suitable bearings formed in the upright K' of the frame K K², these crank-shafts *r r* being operated by the pitmen *p p* and engines J J in the ordinary manner.

It is obvious that, if there is at certain points in a canal or other body of water a great depth of water, the float H will support the wheel P and its operating mechanism. Then the wheel P acts on the water as a paddle-wheel. But when the water in the canal is of the ordinary depth, then the periphery of the wheel P rolls on the ground and acts as a traction-wheel to draw the load. During all the time that the wheel P is operating on the ground the frame K K' K², with its operating mechanism, is raised more or less from the float, according to the unevenness of the ground.

It is also obvious that the boat when in motion, by reason of having its paddle-wheel P operating in the hole I of the float H, does not throw any swells against the banks to wash them.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for towing vessels, the tender A, provided with the forked plate D, and having the pinion E, with hand-wheel *a*, combined with the segment-cog and hinge-plate G' of the frame K K², as and for the purpose specified.

2. The frame K K' K², having the inclined engines J J and their mechanism firmly attached thereto united with the cog-plate F and tender A by the hinge-joint G, as and for the purpose specified.

3. The hinged adjustable frame K K' K², having a pair of inclined stationary engines, J J, firmly secured thereto, combined with the combined traction and paddle wheel P, having the cog-wheels L L attached to its sides, and the spur-pinions L' L', mounted on the crank-shafts *r r*, as and for the purpose specified.

4. The combined traction and paddle-wheel P, having its tread formed of thin and wide rings or bands of iron and its sides near the periphery formed with annular tapering converging plates M M, combined with the spokes *n*, the hub *n'*, the shaft *w*, and the cog-wheel rims L L, as and for the purpose specified.

5. The float H, with vertical central hole, I, formed with water-tight compartment H', and provided with upright standards or guides *d d*, combined with the hinged adjustable frame K K' K² and tender A, as and for the purpose specified.

6. The combination of the tender A, the hinged frame K K' K², the engines J J and their operating mechanism, the wheel P, and float H, as and for the purpose specified.

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

JAMES BUCHANAN.

Witnesses:
C. W. BROUSE,
E. O. FRINK.