

(No Model.)

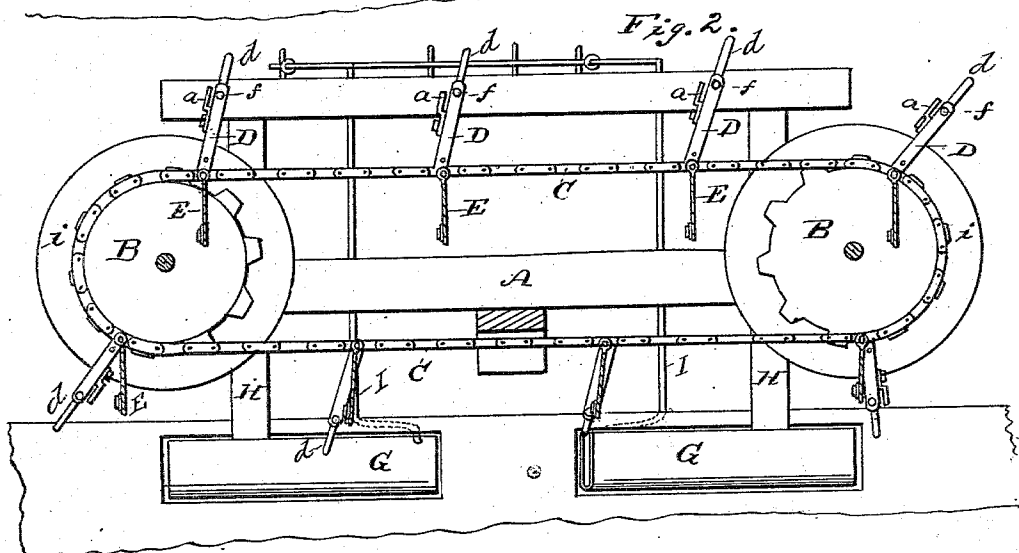
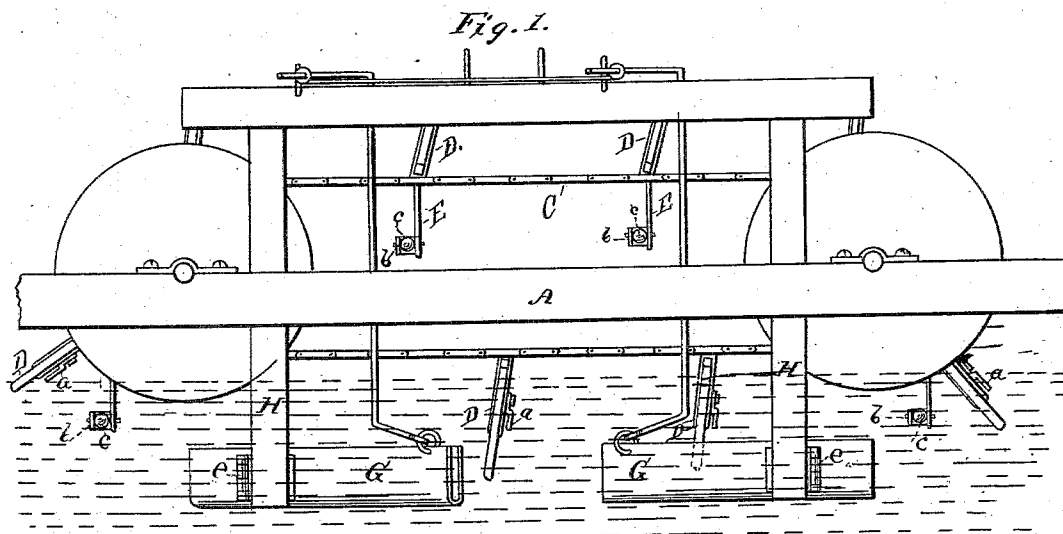
2 Sheets—Sheet 1.

J. S. SMITH.

PROPELLING APPARATUS FOR VESSELS.

No. 296,476.

Patented Apr. 8, 1884.



WITNESSES

Chas. R. Burr
W. E. Bowen

INVENTOR

James Scott Smith
per O. E. Duff
Attorney

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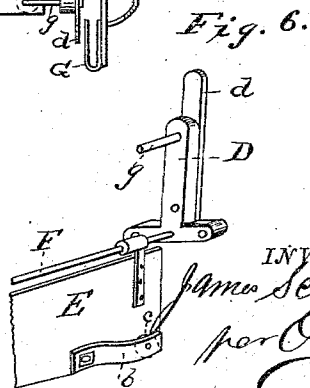
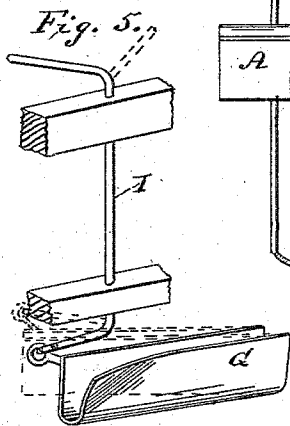
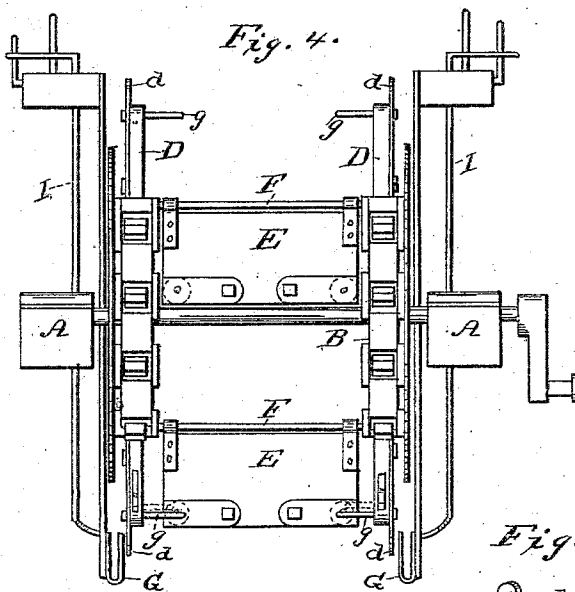
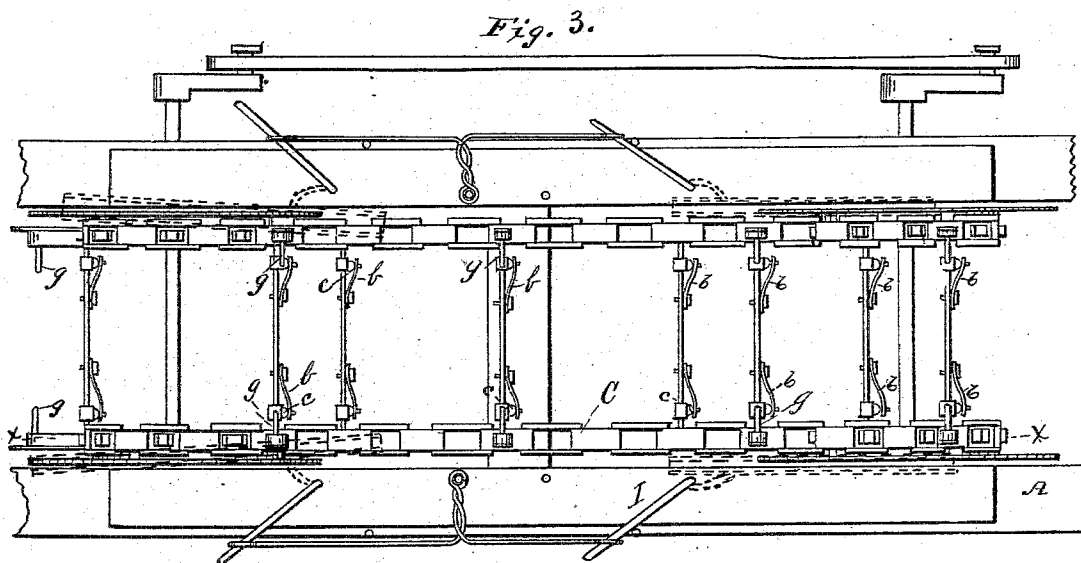
2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JAMES SCOTT SMITH, OF MARSHALL, ARKANSAS.

PROPELLING APPARATUS FOR VESSELS.

SPECIFICATION forming part of Letters Patent No. 296,476, dated April 8, 1884.

Application filed December 4, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES SCOTT SMITH, of Marshall, in the county of Searcy and State of Arkansas, have invented certain new and useful Improvements in Propelling Apparatus for Vessels; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention has relation to propulsion of steamboats, and has for its object to propel boats or vessels with greater speed and velocity with less expenditure of power than has heretofore been done, and to make the paddles of the propeller give a buoyancy to the moving vessel according to her speed and the power exerted.

To this end my invention consists, first, in the peculiar construction and arrangement of the chain propelling-paddles in such manner that the paddle strikes the water at such an inclination as to assist in buoying up the weight of the vessel; second, in the construction of the chain provided with bracket and spring rods in combination with the paddles, the said paddles being arranged to be worked at an inclination from a vertical line while in the water, and to be released by trip mechanism; third, in the peculiar arrangement of the paddles and the governing-guide trip mechanism, whereby the paddles may be readily utilized and adapted to either direction with the same facility; fourth, in other details of construction, which will be more fully hereinafter described, and pointed out in the claims. All these parts are designed to be below the ship's deck, thus being entirely out of the way and out of sight, the advantages of which are obvious.

Referring to the accompanying sheets of drawings, Figure 1 shows a side elevation of my improved propelling apparatus. Fig. 2 shows a vertical longitudinal section, taken on the line *x x* of Fig. 3, clearly showing the working-chain and paddles, sprocket-wheels, bracket-arms, and tripping mechanism. Fig. 3 shows a top plan view of the machine; also showing an edge view of the paddles and cushioning-springs and blocks. Fig. 4 is an end elevation of the apparatus. Fig. 5 illustrates a detached view of the governing-guide and tripping mechanism, and Fig. 6 shows a detached view of the carrying-chain link having the bracket-arm and paddle-carrying rod with paddles.

The same letters will denote like parts in all the figures, in which—

A represents the frame-work, of any ordinary construction.

B is the chain-carrying sprocket-wheel, which may either be provided with projecting teeth or indentations on its periphery for the reception of the chain.

C is the working-chain carrying the bracket-arm D, against which the paddles E work. Upon the back of brackets D, I locate a swivel-rod, *a*, which may be readily thrown out to form a platform when required, at such times as when repairs or replacing of parts are necessary. The brackets D are arranged on the chain in such manner as to give to the paddle an inclination on reaching the water, so that the paddle not only propels the boat, but also has a buoying action in preventing the boat from lowering herself deeper in the water while in motion, as is usually the case with the ordinary paddle-wheels. These paddles E are hinged upon a tie-rod or shaft, F, which also serves to hold the working-chains parallel and in their proper working position. Upon the back of the paddles I locate spring-pieces *b*, of metal, and between these spring-pieces *b* and the paddle-blade I locate rubber balls *c*, for the purpose of breaking the concussion or violent knock of the paddle-blade against the bracket-arm D when the paddle strikes the water. By this means the paddles seat themselves easily against the brackets by the yielding action of the spring and cushioning-ball, and thus the rough and unpleasant jarring of the boat is avoided.

Upon the outer end of the bracket-arm D I also fix a spring-bar, *d*, carrying at right angles thereto a short cross-bar, *g*, which passes through a hole, *f*, in the end of the bracket-arm D, which cross-bar *g* carries and holds rigidly the paddles against the pressure of the water and the power exerted by the engine.

It will be understood that the paddles simply

bear against the short bars *g* when in motion, so that when the paddles leave the water they automatically relieve themselves, and then vertically, in which position they carry no water with them.

The springs *d* project beyond the end of the bracket *D*, the object of which will be more fully described in connection with Fig. 5, and which will now be explained. Just below the carrying-chain, and somewhat under and between the sprocket-wheels, are located what I term "guide" and "trip" mechanism *G G*, which are trough shape, without ends. These guides have one of their ends flaring, terminating in a narrow end, as shown by the detached Fig. 5, and which are suspended by hangers *H H* from the frame-work, or may be hinged to the side of the vessel. These guides are also hinged near one of their ends to swing horizontally, (see *e*, Fig. 1,) for the purpose of throwing them in and out of gear with the springs of the paddle-blades, and are operated by a double-crank lever, *I*, journaled in the frame-work. When the guides *G G* are not in use, or either of them, they are swung back into a recess in the side of the vessel formed for that purpose. It is obvious that any suitable mechanism may be employed for the guides and for operating them. These guides *G G* are provided at one of their ends with a flaring mouth, as before stated, so that when in use the end of the spring *d* catches into the flaring mouth, and is carried along until it reaches the narrow end, where it releases the paddle. On the same side, and facing the guide just described, is a similar guide, whose function is just the same as the one to which I have just alluded, only it acts when the boat is running in an opposite direction or backing out.

The chains are kept in position sidewise by flanges secured to the sides of the sprocket-wheels, as seen in section at *i i*, Fig. 2.

It is obvious that when the paddle-blade strikes the water by my arrangement it is in a vertical line, and therefore takes its hold without striking the water flatwise, thus easily taking hold without loss of force or friction.

The crank-shafts, as usual, pass to each side of the frame-work, so that the power or thrust of the engine is equalized, and which may be mounted at right angles. This apparatus may be secured between two shells; or it may be economically arranged in the hull of the vessel by properly cutting away a portion and housing the machinery so that it is completely out of

the way and housed in. This method of propulsion is peculiarly and profitably adapted to steam navigation on canals and rivers where danger of washing the banks is injurious and expensive, and which is well known to engineers.

My invention may be also profitably employed for running portable floating mills in rivers where the currents are of sufficient velocity to run the apparatus; and is peculiarly applicable where rivers rise and fall rapidly, so that the floating mill will rise and fall with the river, and which mill may be moved from place to place when desired. Damming rivers for mill purposes, with my invention, may be dispensed with.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in propelling mechanism for vessels, consisting of the sprocket-wheels and working-chains having bracket-arms secured thereto, said arms being provided with a spring-bar, which is pivoted on a cross-rod passing through the bracket-arms, whereby the paddles are held against undue strain, substantially as described.

2. A propelling apparatus consisting of the sprocket-wheels and chains, the latter having bracket-arms, in combination with the guide and tripping mechanism, whereby motion is imparted to the paddles and also released, for the purpose set forth.

3. The combination, in a propelling apparatus consisting of the sprocket-wheels and chains, the latter provided with bracketed spring-arms, of the hinged paddles provided with the cushioning devices, all operating together as set forth and described.

4. The combination, in an apparatus for propelling vessels, of the sprocket-wheels and chains provided with bracket-arms, and with the paddle-blades having on their backs springs and compression-balls interposed between said springs and paddle, for preventing concussion of the paddle-blades against the bracket, as described.

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

JAMES SCOTT SMITH.

Witnesses:

B. F. MORSELL,
O. E. DUFFY.