

Improvement in Propulsion of Vessels.

Patented May 23, 1871.

The image contains two technical drawings of a mechanical press, likely for printing.
Fig. 2. is a side-view cross-section of the press. It shows a horizontal frame with a base plate. A large flywheel (labeled 'd') is mounted on the right side, connected to a long horizontal crank arm (labeled 'e'). This crank arm is pivoted at its left end to a vertical support (labeled 'f'). A long connecting rod (labeled 'g') is attached to the crank arm and extends to the left, where it is connected to a vertical lever (labeled 'h'). The lever is pivoted at its bottom end to the frame. A horizontal bar (labeled 'i') is attached to the lever and extends to the right, where it is connected to a vertical rod (labeled 'j'). This rod is part of a mechanism that operates a printing plate (labeled 'k'). Various other components are labeled with letters: 'a' for a small wheel or pulley, 'b' for a spring or buffer, 'c' for a support post, 'd' for the flywheel, 'e' for the crank arm, 'f' for the pivot, 'g' for the connecting rod, 'h' for the lever, 'i' for the horizontal bar, 'j' for the vertical rod, 'k' for the printing plate, 'l' for a guide or stop, 'm' for a small wheel or pulley, 'n' for a spring or buffer, 'o' for a small wheel or pulley, 'p' for a small wheel or pulley, 'q' for a small wheel or pulley, 'r' for a small wheel or pulley, 's' for a small wheel or pulley, 't' for a small wheel or pulley, 'u' for a small wheel or pulley, 'v' for a small wheel or pulley, 'w' for a small wheel or pulley, 'x' for a small wheel or pulley, 'y' for a small wheel or pulley, 'z' for a small wheel or pulley.

Fig. 3. is a top-down view of the same mechanism. It shows the layout of the various components from above. The frame is labeled 'A'. The printing plate is labeled 'k'. The various components are labeled with letters: 'a' for a small wheel or pulley, 'b' for a spring or buffer, 'c' for a support post, 'd' for the flywheel, 'e' for the crank arm, 'f' for the pivot, 'g' for the connecting rod, 'h' for the lever, 'i' for the horizontal bar, 'j' for the vertical rod, 'k' for the printing plate, 'l' for a guide or stop, 'm' for a small wheel or pulley, 'n' for a spring or buffer, 'o' for a small wheel or pulley, 'p' for a small wheel or pulley, 'q' for a small wheel or pulley, 'r' for a small wheel or pulley, 's' for a small wheel or pulley, 't' for a small wheel or pulley, 'u' for a small wheel or pulley, 'v' for a small wheel or pulley, 'w' for a small wheel or pulley, 'x' for a small wheel or pulley, 'y' for a small wheel or pulley, 'z' for a small wheel or pulley.

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IMPROVEMENT IN PROPULSION OF VESSELS.

Specification forming part of Letters Patent No. 115,204, dated May 23, 1871.

To all whom it may concern:

Be it known that I, REUBEN W. HEYWOOD, of Baltimore city, in the State of Maryland, have invented a new and useful Improvement in Propellers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a plan view; Fig. 2, a longitudinal sectional elevation; and Fig 3 is a transverse sectional elevation.

This invention relates to improvements in apparatus for propelling canal-boats of the class in which a reciprocating carriage, armed with hinged blades that are placed transversely of the boat, travels back and forth lengthwise along the bottom of the boat, the said blades, when the carriage is moving in one direction, extending down into the water and communicating to the boat the motion derived from the resistance of the water, and said blades, when the carriage is moving in the other direction, folding up against the bottom of the boat, and consequently imparting no motion thereto.

Referring to the drawing, A is a canal-boat having secured lengthwise of its bottom, one at each side thereof, a pair of grooved guides, *a*, between which is placed a carriage, *b*, the ends of which extend into the grooves of said guides. *c* are blades hinged to the under side of the carriage *b*, crosswise of the boat. *d d* are rollers placed in orifices made in the bottom of the boat, and mounted in boxes located at the ends of said orifices. *e* is a horizontal shaft mounted in standards *f*, crosswise of the boat, at the stern thereof, and at a suitable height above its bottom. *g g* are collars keyed upon said shaft. *h* is a cord fastened at its extremities to the ends of the carriage *b*, passing over the rollers *d* and wound around one of the collars *g*. By means of this cord and the shaft *e* and collar *g*, when the shaft is rotated the carriage is propelled along the bottom of the boat in one direction or the other. If the carriage moves sternward the blades *c* unfold and press against the water, thus propelling the boat forward. Springs *i* are placed between the blades and the carriage in order to keep the blades slightly open, so as to allow the water to unfold them. While the carriage

moves forward the water folds the blades against the spring *i*, in which position they offer no hinderance to the motion of the boat. Cords *j*, fastened at their ends to the blades *c*, near the outer edges of the latter, and running through orifices made in the carriage *b*, and along grooves cut in the upper side of the latter, pass upward over the rear roller *d*, and are fastened at their other ends to the exteriors of rings *k* that are placed on and outside of the collars *g*, said rings being provided with pawls *l* that engage with ratchets formed in the perimeters of said collars. By disconnecting the pawls *l* from their ratchets the rings *k* may be turned on the collars *g* so as to wind the cords *j* upon the latter. By this means the cords *j* may be wound up so far as to prevent the blades *c* from opening to their full extent, and this is to be done when the boat is floating in water too shallow for the whole width of the blades. Two cogged wheels, *n*, are placed loosely on the shaft *e*, with a friction-clutch, *o*, between them. The wheels *n* are connected with cog-wheels *p*, which are rotated by the piston-rod of the engine. A small gear, *r*, is interposed between one of the wheels *n* and its driver *p*, in order that motion in opposite directions may be imparted to the wheels *n*, which motion is communicated to the shaft *e* from each wheel *n* alternately by means of the clutch *o*, the object being to reverse the motion of the shaft, and, by consequence, of the carriage *b*, every time said carriage arrives at either end of its throw. The clutch *o* is embraced by arms *s*, which spring from a block, *t*, that is secured to a sleeve, *u*, which is placed loosely upon a horizontal rod, *v*, mounted in standards crosswise of the boat, and at a suitable distance above its bottom. An endless cord, *w*, is tied to the block *t*, and runs thence in opposite directions, one branch passing over a sheave, *x*, mounted on a vertical pin that springs from the bottom of the boat, thence extending forward to a staple, *y*, that projects from a cylindrical block, *z*, which has journals projecting horizontally into boxes *a'*, secured to the bottom of the boat; and the other branch of the cord *w* passing over a sheave, *b'*, mounted on a horizontal pin that extends from a block, *c'*, fastened to the bottom of the boat, thence back to the sheave *x*,

around which said cord is wound, and thence forward to the staple *y*, passing to the opposite side of the block *z* from the other branch of the same cord. The cord *h* passes through the staple *y*, and upon said cord are fastened two knobs, *d'*, placed at such an interval apart that one or the other of said knobs strikes the staple *y* just a moment before the carriage *b* arrives at the end of its throw. The staple, being moved by the knob, turns the block *z*, and the block *z*, through the medium of the cord *w*, sheaves *x b'*, sliding sleeve *u*, and arms *s*, throws the clutch *o* out of gear with that one of the wheels *n* with which it had previously been in gear, thus stopping the carriage. The throwing of the clutch into gear with the other wheel *n* is effected by means of a spring-bar, *e'*, that passes through two standards, *f'*, stepped in the bottom of the boat, one at each side of the block *z*, said spring-bar pressing upon a rib, *g'*, that stands out from a semi-cylindrical block, *h'*, which projects from one end of the block *z*. The knob *d'* turns the blocks *z* and *h'* so far as to incline the rib *g'* under the spring-bar *e'* until the latter presses upon the side of the former, and is consequently able to turn the blocks by its own force far enough to throw the clutch *o* into gear. At the bow of the boat a lever, *k'*, is hung vertically, the same extending downward into the water to any desired distance below the bottom of the boat. A cord, *l'*, fastened to the lever *k'* above its fulcrum, runs thence downward into the boat and backward along its bottom to the rear standard *f'*, around which said cord passes, and runs thence forward to the rear end of a wedge, *m'*, which is made with a slot, through which the front

standard *f'* passes, and through which, also, a pin extends upward from the bottom of the boat. If the lower end of the lever *k'* should chance to strike a sand-bar it would thereby be moved backward while its upper arm would be moved forward, and, by means of the cord *l'* and standard *f'*, the wedge *m'* would be drawn sternward under and against the block *h'*. Then when either knob *d'* next struck the staple *y*, it would rotate it far enough to throw the clutch *o* out of gear, but the wedge *m'* would prevent the spring-bar *e'* from continuing the rotation of the blocks *z* and *h'* sufficiently far to throw the clutch *o* into gear with the other wheel *n*. The consequence would be that the shaft *e* would cease rotating, the carriage *b* would stop, and the boat lose headway, so that she would not be likely to run upon the sand-bar with any great force.

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

1. The apparatus for throwing the clutch *o* out of gear, consisting essentially of the cord *h*, knobs *d'*, staple *y*, cylindrical block *z*, sheaves *x b'*, cord *w*, and sliding arm *s*, arranged as described.

2. The apparatus for throwing the clutch *o* into gear, consisting essentially of the block *z*, rib *g'*, spring-bar *e'*, sheaves *x b'*, cord *w*, and sliding arms *s*, arranged as set forth.

3. The apparatus for stopping the carriage, consisting essentially of the lever *k'*, cord *l'*, standard *f'*, wedge *m'*, arranged as explained.

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Witnesses:

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