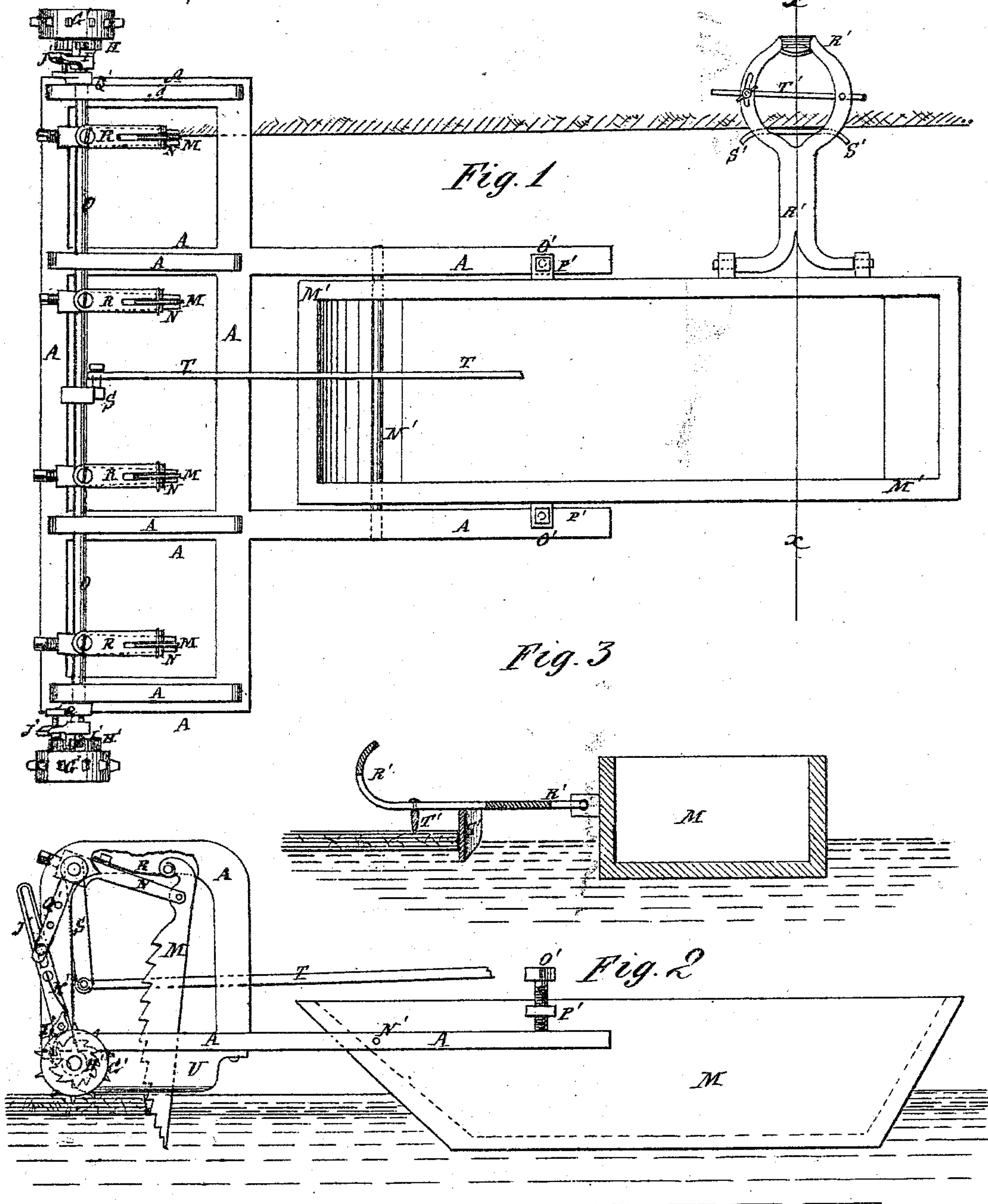


L. TOWNSEND.
Improvement in Ice-Cutters.

No. 132,035.

Patented Oct. 8, 1872.



Witnesses:

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H. A. Graham

Inventor:

Louis Townsend

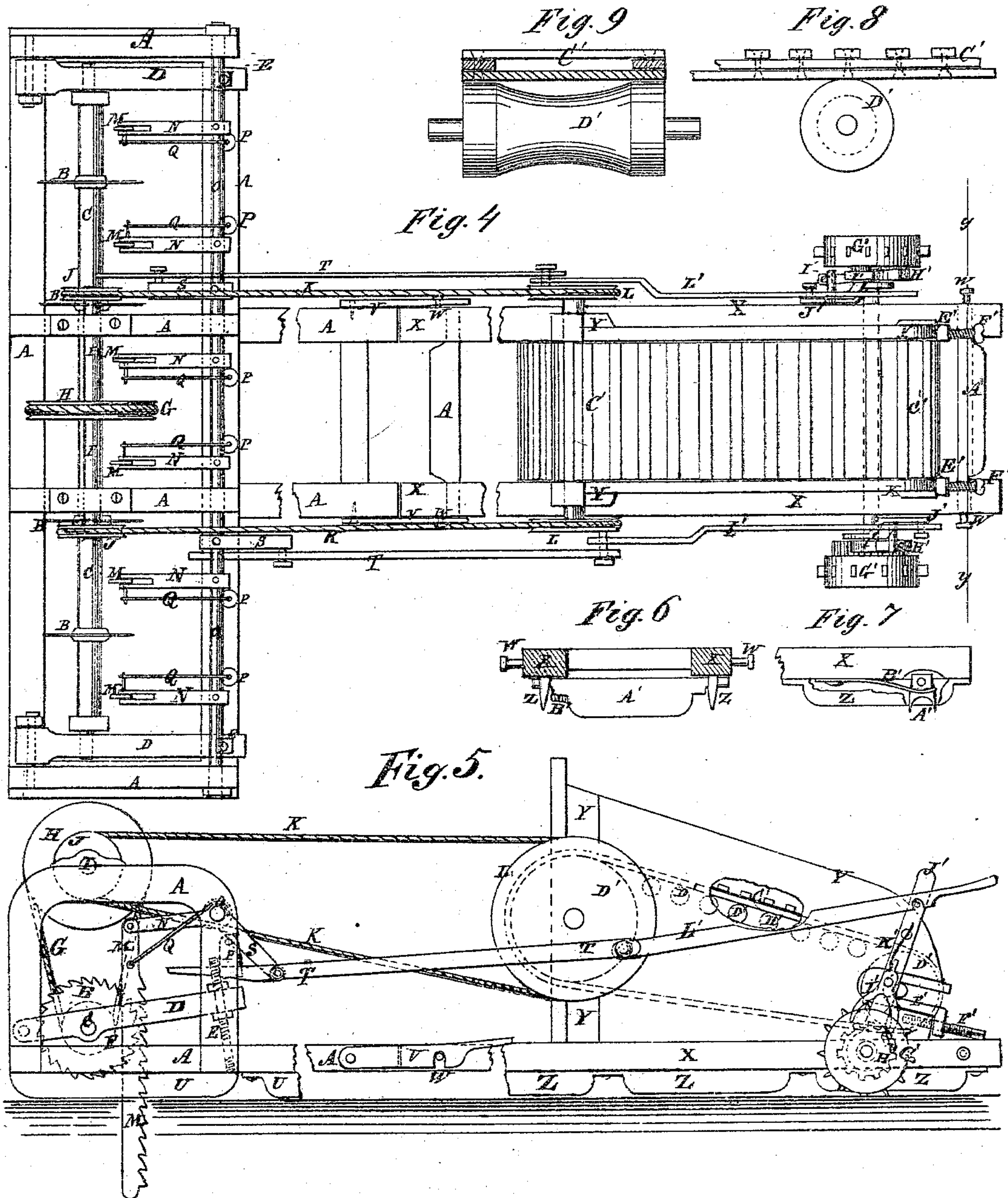
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UNITED STATES PATENT OFFICE.

LOUIS TOWNSEND, OF TERRE HAUTE, INDIANA.

IMPROVEMENT IN ICE-CUTTERS.

Specification forming part of Letters Patent No. 132,035, dated October 8, 1872.

To all whom it may concern:

Be it known that I, LOUIS TOWNSEND, of Terre Haute, in the county of Vigo and State of Indiana, have invented a new and useful Improvement in Ice-Cutter, of which the following is a specification:

Figure 1, Sheet 1, is a top view of my improved ice-cutter arranged for use with a boat. Fig. 2, Sheet 1, is a side view of the same, part being broken away to show the construction. Fig. 3, Sheet 1, is a detail section of the same taken through the line *xx*, Fig. 1. Fig. 4, Sheet 2, is a top view of the same, showing a driving-power connected with it and arranged to run upon the ice. Fig. 5, Sheet 2, is a side view of the same. Fig. 6, Sheet 2, is a detail cross-section of the same taken through the line *yy*, Fig. 4. Fig. 7, Sheet 2, is a detail side view of the part of the machine shown in Fig. 6. Fig. 8, Sheet 2, is a detail edge view of a part of the endless belt of the power. Fig. 9, Sheet 2, is a detail cross-section of the upper part of the endless belt of the power.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish an improved machine for cutting ice for packing; for opening a passage for vessels, &c.; shall be simple in construction, effective in operation, and easily adjusted and moved from place to place; and it consists in the construction and combination of various parts of the machine, as hereinafter more fully described.

A is the frame-work, which carries the saws, and is made in T-form, as shown in Figs. 1 and 4. B is a set of circular saws, attached to a shaft, C, and which are intended to take the place of ice-plows in cross-marking the ice, and which are not intended to cut through the ice. The ends of the shaft C revolve in bearings in bars D, the forward ends of which are pivoted to the front part of the frame-work A. The rear ends of the bars D are slotted to receive the screws E, which are attached to the rear sill of the frame A, so that the circular saws B may be raised out of contact with the ice, or lowered to cut the ice to any required depth, by moving the rear ends of the bars D up or down upon the screws E. The bars D are secured, when adjusted, in place upon the screws E by nuts placed upon said screws above and below said bars D, as shown in Fig. 5. To the middle part of the shaft C is at-

tached a pulley, F, around which passes a band, G, which also passes around a larger pulley, H, attached to a short counter-shaft, I, which revolves in bearings attached to the upper part of the frame-work A. To the ends of the shaft I is attached a pulley, J, around which pass bands K, which also pass around the drive-pulleys L of the power. M are the saws for cutting the ice, the upper ends of which are pivoted to the outer ends of arms N, attached to the shafts O adjustably. The saws M are held forward against the ice by weights P, connected with the upper parts of the saws by cords Q, which pass over the shafts O, as shown in Figs. 4 and 5. The same thing may be accomplished by springs R attached to the arms N, and which press against the upper ends of the said saws M, as shown in Figs. 1 and 2. To the shafts O are adjustably attached crank-arms S, to the crank-pins of which are pivoted the ends of the connecting-bars T, the other ends of which are pivoted to crank-pins attached to the pulleys L of the power. To the under side of the bars of the frame A, that run in the direction in which the cutter moves, are attached runners U, some of which may be grooved longitudinally to enable them to take a firm hold upon the ice and prevent lateral slip. To the side of the rearwardly-projecting part of the T-frame A are pivoted bars V, which have notches or hooks formed upon their free ends to hook upon catches W, attached to the side of the end parts of the horizontal frame X, to which the frame-work Y of the power is secured. Both ends of the frame X are provided with catches W, so that the cutter-frame A may be connected with either end of the frame X, to enable the return cuts to be made without turning the power. To the under side of the longitudinal bars of the frame X are attached runners Z, upon which the power moves. A' are cross-runners, the faces of which are grooved longitudinally, and the ends of which are pivoted eccentrically to the side bars of the frame X, so that when turned in one direction the said runners may be held free from the ice, and when turned in another direction their faces may project below the runners Z to support the frame and enable it to be moved laterally to adjust it to make a return trip. The runners A' are held in position, when adjusted, by springs B', which rest against a

squared or flattened part of their journals, as shown in Figs. 6 and 7. C' is the endless belt of the power, which is made of leather, is made double at its edges or throughout its whole extent, and to which are attached cross-slats for the horse to walk upon. The endless belt C' passes around a series of rollers, D', the upper and lower ones of which are made larger and are concaved, as shown in Fig. 9. The rollers D' are placed close together and in line with the under side of the upper part of the endless belt C', so that the said upper part of the belt upon which the horse walks may be fully supported. The journals of the upper roller D' project, and to them are attached the band and crank wheels L for driving the saws. The journals of the lower roller D' revolve in sliding bearings E', which are held in place and adjusted by set-screws F', so that the endless belt C' can be tightened and slackened by turning the said screws F'. G' are toothed or spur wheels pivoted to the frame X, and with which are rigidly connected ratchet-wheels H', upon the teeth of which the pawls I' take hold. The pawls I' are pivoted to the bars J', which ride upon the journals of the spur-wheels G', are made double, and are held against the teeth of the ratchet-wheel H' by the springs K' attached to the bars J', and which press against a lug formed upon the upper end of the pawls I'. By changing the spring K' from one to the other side of the upper end of the pawl I' the spur-wheel H' will be turned in one or the other direction according to the direction in which it is desired to have the machine advance. To a crank-pin attached to the bar J' is pivoted the end of a connecting-bar, L', the other end of which is pivoted to the crank-pin of the wheel L, as shown in Figs. 4 and 5, so that the power may move forward automatically as the saws cut their way through the ice. This construction enables the power to be placed at a considerable distance from the edge of the ice, and at any desired distance in front of the cutters, so that there may be no danger of breaking through. In some cases it is desirable to have the saws work in advance of the power. In this case the saws M are reversed, as shown in Fig. 2, and the power is mounted in a boat or raft, M', or rather the frame X is replaced or made in the form of a boat or raft. The rear part of the T-frame A is pivoted to the forward end of the boat M' by a long bolt, N, which passes through the said boat and through the bars of the said part of the frame A. O' are screws which pass through the stationary nuts P' attached to the sides of the boat M' in such positions that the forward ends of the said screw O' may rest against the upper sides of the rear ends of the said bars of the rear part of the T-frame A, so that the cutter may be properly adjusted to the surface of the ice under all circumstances. In this case the spur-wheels G', ratchet-wheels H', pawls I', springs K', and pivoted bars J' are detached from the

power and are attached to the forward part of the frame A, and the bars J' have slots formed in them to receive the crank-pin of the arm Q' attached to the shaft O that carries and operates the saws M. To the sides of the boat M' is pivoted an arm, R', to the lower side of the outer part of which is attached a plate or fender, S', which bears against the edge of the ice and thus keeps the boat from coming too close to said edge. To the under side of the pivoted arm R', a little further out than the fender S', is secured a runner, T', which is pivoted at one end, and is secured at its other end by a screw which passes through a slot in the arm R', so that by setting the runner T' at an inclination with the edge of the ice it may tend to draw the boat toward said edge, and thus in connection with the fender S' keep the boat always at the proper distance from the edge of the ice.

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

1. The frame A of an ice-cutter made in T-shape to adapt it to be attached to the power in such a way that the power may be at a distance from the edge of the ice and from the saws, substantially as herein shown and described, and for the purpose set forth.
2. The frame X, provided with the runner Z and the pivoted cross-runners A', in combination with the T-frame A that carries the saws, for the purpose of carrying the power that operates said saws, substantially as herein shown and described.
3. The combination with the power C' D' of the spur-wheels G', ratchet-wheels H', pawls I', whether double or single, spring K', and pivoted bar J', whether attached to the frame X that carries the power or to the frame A that carries the saws, substantially as herein shown and described, for the purpose of carrying the machine forward by the same power that operates the saws, as set forth.
4. The levers or arms N in combination with the rock-shaft O for operating the saws, substantially as herein shown and described.
5. The combination of the pivoted, notched, or hooked bars V with the frame A that carries the saws and with the frame X that carries the power, substantially as herein shown and described, and for the purpose set forth.
6. The combination of a boat, M', with the T-frame A that carries the saws, substantially as herein shown and described, and for the purpose set forth.
7. The combination of the screws O' and stationary nuts P' with the boat M' and T-frame A that carries the saws, substantially as herein shown and described, and for the purpose set forth.
8. The pivoted arm R', stationary guide S', and adjustable runner T' in combination with the boat M' and frame A that carries the saws, substantially as herein shown and described, and for the purpose set forth.
9. The combination of the cord and weight

Q P, or equivalent spring, with the arms N and saws M, substantially as herein shown and described, and for the purpose set forth.

10. The combination of a set of circular saws, B, and their shafts and pulleys with the T-frame A that carries the straight saws M, substantially as herein shown and described, and for the purpose set forth.

11. The combination of the pivoted bars D

and adjusting-screws E with the T-frame A and with the shaft C that carries the circular saws B, substantially as herein shown and described, and for the purpose set forth.

LOUIS TOWNSEND.

Witnesses:

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M. JOSEPH.