

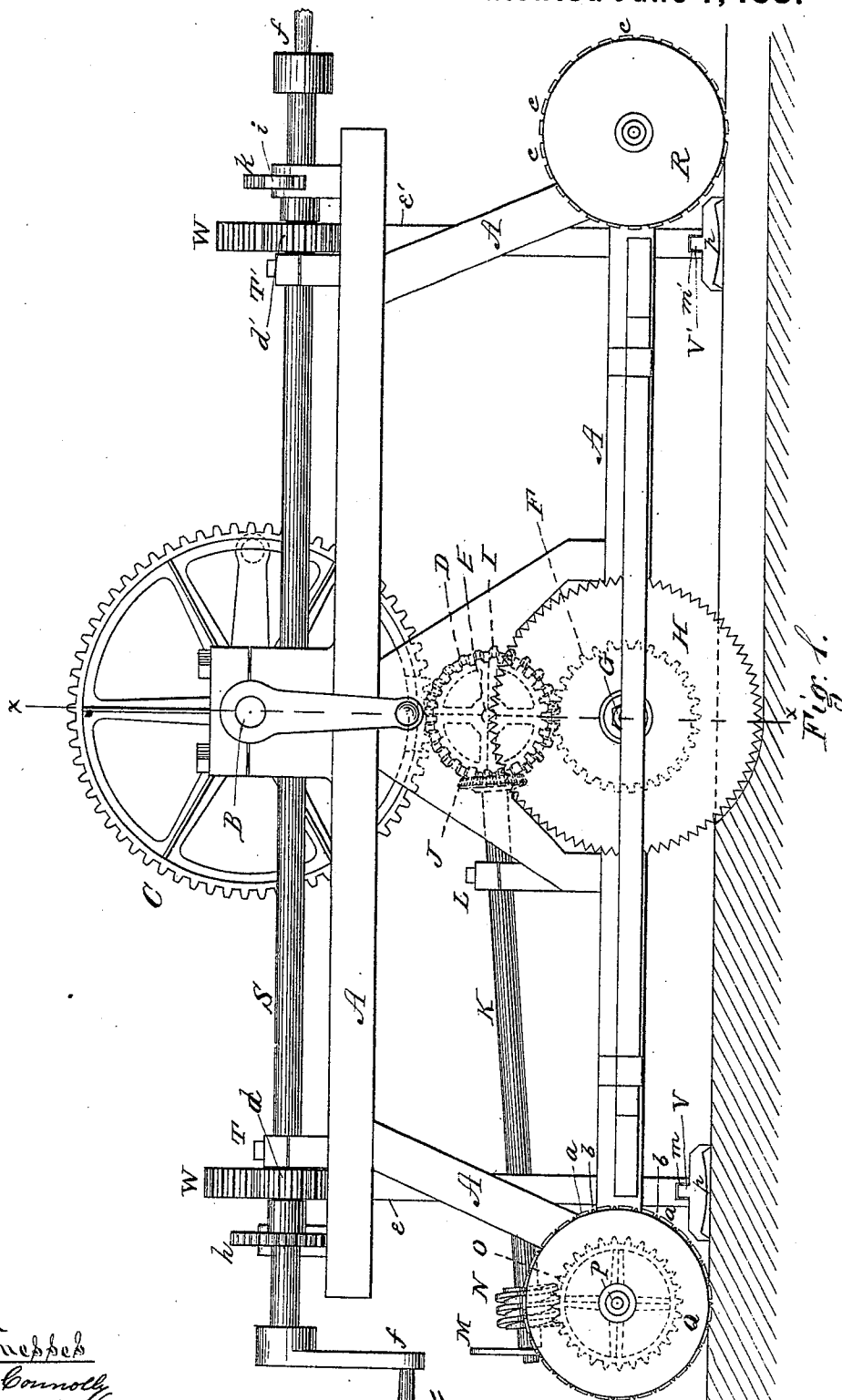
(No Model.)

2 Sheets—Sheet 1

M. J. FAAS.
Ice Harvester.

No. 242,524.

Patented June 7, 1881



Witnessed
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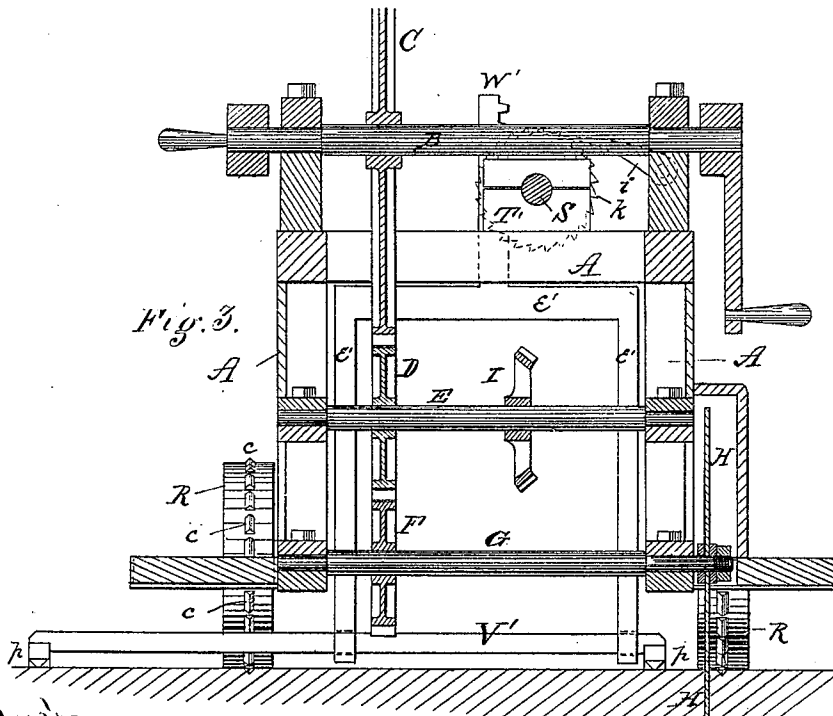
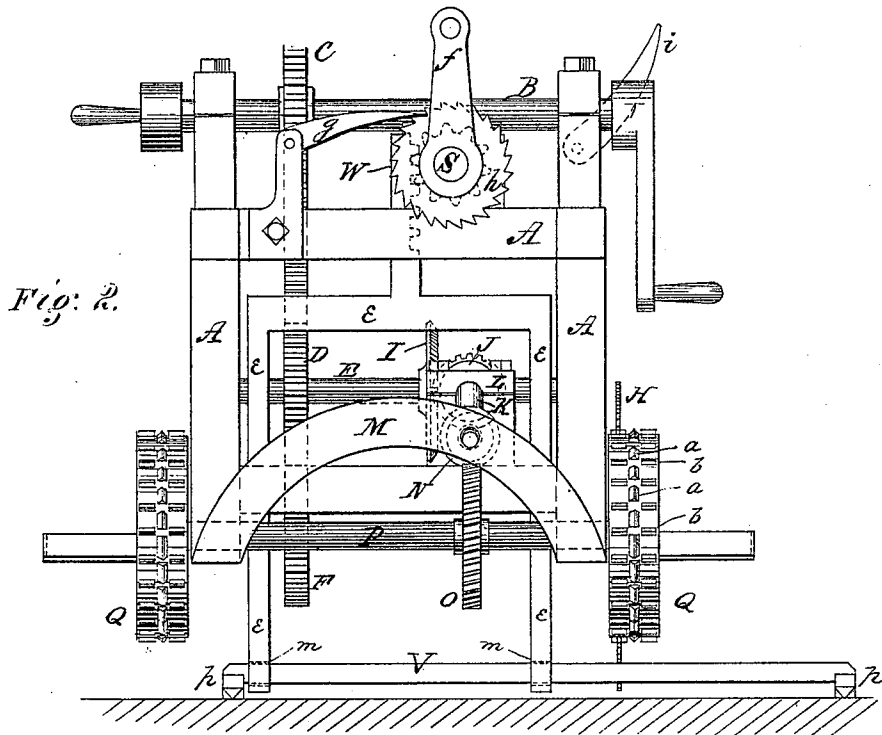
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UNITED STATES PATENT OFFICE.

MICHAEL J. FAAS, OF TARENTUM, PENNSYLVANIA.

ICE-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 242,524, dated June 7, 1881.

Application filed February 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL J. FAAS, of Tarentum, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Ice-Harvesters; 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, which form a part of this specification.

This invention relates to ice-harvesting machinery—that is, machinery for sawing into strips or blocks the ice as it lies on the surface of the water.

The invention consists in a frame-work or carriage vertically adjustable and having two modes of support, one a set of wheels which give the carriage movement in the direction in which the saw operates, and the other a pair of slides which permit lateral movement of the carriage for a fresh cut. Further, in constructing the supporting-wheels so that when they are revolved they will catch in the ice and feed the whole carriage forward or backward, as desired; and it further consists in a vertical adjustment by which the saw may be lowered with the carriage for cutting, or may be elevated for lateral movement to take a fresh cut; and it finally consists in the construction and combination of parts, substantially as herein-after fully described and claimed.

Referring to the accompanying drawings, the invention will be fully understood from the following:

Figure 1 is a side elevation of the machine. Fig. 2 is a rear end elevation. Fig. 3 is a transverse vertical section on line *x x* of Fig. 1.

A A A, &c., designate the parts of the frame-work or carriage, built in any suitable form or design. In suitable bearings on this carriage is the main shaft B, which is revolved by hand-power or a steam-engine, which may be carried on the frame-work, or the shaft B may, in fact, be revolved by any means found most available or suitable to the circumstances. On shaft B is a large spur-wheel, C, which meshes with a pinion, D, keyed on a counter-shaft, E, which, like the shaft B, crosses the frame or carriage A transversely. Pinion D, in turn, meshes with another pinion, F, under it, and this pin-

ion F is fixed on the spindle G of a circular saw, H, which is set so as to revolve in a plane parallel with the length of the carriage A, and preferably just beside the lower timber or bar of said carriage. Motion given shaft A is thus communicated to saw H, and if the latter be made with V-teeth the saw will cut in either direction.

On the counter-shaft E is keyed, also, a beveled or mitered spur-wheel, I, which meshes at right angles with a mitered pinion, J, keyed on a shaft, K, which runs lengthwise of the carriage, as shown, and has the bearing L on a bar crossing the carriage near the counter-shaft E, and a bearing at the other end consisting of a bridge-piece, M, which springs from the two lower side bars of the carriage-frame. The shaft K has, near bridge M, a worm-gear, N, which meshes with a pinion, O, set on an axle, P, which is transversely journaled in the lower side bars of the carriage A, as shown.

Fixed to the ends of the axle P are the wheels Q, having a broad face, as shown. The face of each wheel Q is armed with three rows of chisel-edged spikes, *a b b*, a central row, *a*, whose edges are circumferential, and two side rows, *b b*, which are set so as to alternate with those of row *a*, and whose edges are at right angles with the edges of row *a*. The other end of the carriage A is supported on the wheels R, suitably journaled, and each provided with a single row of spikes, *c*, having their chisel-edges circumferentially arranged like row *a* on wheels Q. Thus constructed the motion imparted to the counter-shaft E from main shaft B is transferred to shaft K, and its revolution is, by means of the worm-gear N and O, transferred to the wheels Q, the motion of course being very much reduced in speed by this form of gearing.

To support and elevate the frame A, and with it the saw H and wheels Q and R, the following construction is adopted: A shaft, S, is set in bearings T on top of the carriage, and stands longitudinally. The two pinions *d d'* are fixed on shaft S, as represented, and each meshes with a vertical rack, W, passing up through the frame-work and guided thereby. Rack W at each end forms a vertical upward prolongation of a frame, *e e e* and *e' e' e'*, whose sides pass down through holes in the lower part of frame A, and are guided thereby so

that the rack *W* and frame *eee* are completely guided so as to move accurately in a vertical plane. Upon rotating the shaft *S* the pinions *d d'* cause the racks *W* to rise or fall, according to the initial position and the direction of revolution, shaft *S* being provided with cranks *f* or hand-wheels for that purpose. The upward limit being reached, is maintained by a pawl, *g*, taking into the ratchet-wheel *h*, and the downward limit is maintained by pawl *i* and ratchet *k*, ratchets *h k* being fixed to the shaft *S* at any desired or convenient points. The lower ends of the side bars, *e*, of each of the frames *eee* and *e' e' e'* are formed with transverse slots *m*, through which pass the transversely-set runners *V V'*, respectively, as shown. The runners *V V'* are armed at their ends with claws *p*, whose teeth are chisel-edged and lie parallel with the plane of revolution of saw *H*.

The machine thus constructed operates in the following manner: Suppose the ice-field to be selected and all in readiness. The machine is set on the ice, after being elevated upon the runners *V V'*, so that the wheels and saw are clear of the ice. The proper direction having been arranged, the shaft *B* is set in motion by whatever power is to be used, and after getting sufficient speed pawl *i* is disengaged and the whole frame gradually lowered. Saw *H* being so located that it will touch and cut into or through the ice before wheels *Q* and *R* touch the ice, the gradual lowering of the frame causes the saw to enter the ice, so that when wheels *Q* and *R* rest firmly upon the ice the saw is in position to work. Now, as before stated, the wheels *Q* and *R* sustain the machine, instead of the runners *V V'*, and the whole weight is held upon them by the pawl *g*, which prevents the runners *V V'* from lowering. The motion being maintained while saw *H* rotates with the proper velocity, the wheels *Q* are also slowly revolved. These being armed, as before described, catch in the ice and propel the whole machine steadily in whichever direction it is desired to go, according to the direction of motion given shaft *B*. This propulsion of the machine will always be in a straight line, owing to the guiding-spikes *a* and *c* in rows upon wheels *Q* and *R*. After a sufficient length of cut has been made cranks *f* are used to elevate the carriage upon the runners *V V'*, so as to clear the wheels *Q R* and saw *H* off the ice, the elevated position being maintained by the pawl *i* and ratchet *k*. Then the whole machine is pushed laterally away from the kerf or cut just made, slid-

ing easily on the lateral runners *V V'*, which are, as before shown, spiked to prevent lateral dragging. When the machine has been pushed till the saw *H* is about in the line of a new cut the motion of shaft *B* is renewed and the previous operations repeated. Operating back and forth in this manner, the machine can cut an enormous amount of ice.

The saw *H* may be of any size, either of a diameter to cut clear through the ice or smaller, so as to cut only a portion of the way, leaving the ice intact, in which latter case the machine may be used to give a set of kerfs at right angles to those first made, thus cutting the ice into rectangular blocks which are easily separated. Any available power may be used. Foot-boards *X* are provided for the operators.

Saw *H* may have an apron covering it above the foot-board, so as to protect the operators from the flying particles or chips of ice.

I claim—

1. An ice-harvester consisting of a motive shaft, a circular saw operated thereby, two or more spiked wheels geared to the motive shaft and sustaining the machine, and vertically-adjustable transverse runners constituting substitute supports for the machine, in combination with suitable means for elevating the machine on said transverse runners and sliding or rolling it laterally thereon, substantially as described.

2. In an ice-harvester, the propelling-wheels *Q*, geared to the motive power and having the circumferentially-edged spikes *a* and the transversely-edged spikes *b* arranged on its face in rows, substantially as described.

3. The combination of the propelling-wheels *Q*, having the chisel-edged spikes *a b b*, arranged as described, with the supporting-wheels *R*, having the spikes *c*, with their chisel-edged circumferential, substantially as specified.

4. The combination of carriage *Δ*, carrying the wheels *Q* and *R*, and the gearing from the motive shaft *B*, with the longitudinal shaft *S*, spur-wheels *d d'*, racks *W W*, frames *e e'*, and runners *V V'*, with suitable means of maintaining said parts at either limit of vertical motion of frames *e e'*, substantially as set forth.

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

MICHAEL J. FAAS.

Witnesses:

T. J. MCTIGHE,
JAMES J. MCTIGHE.