

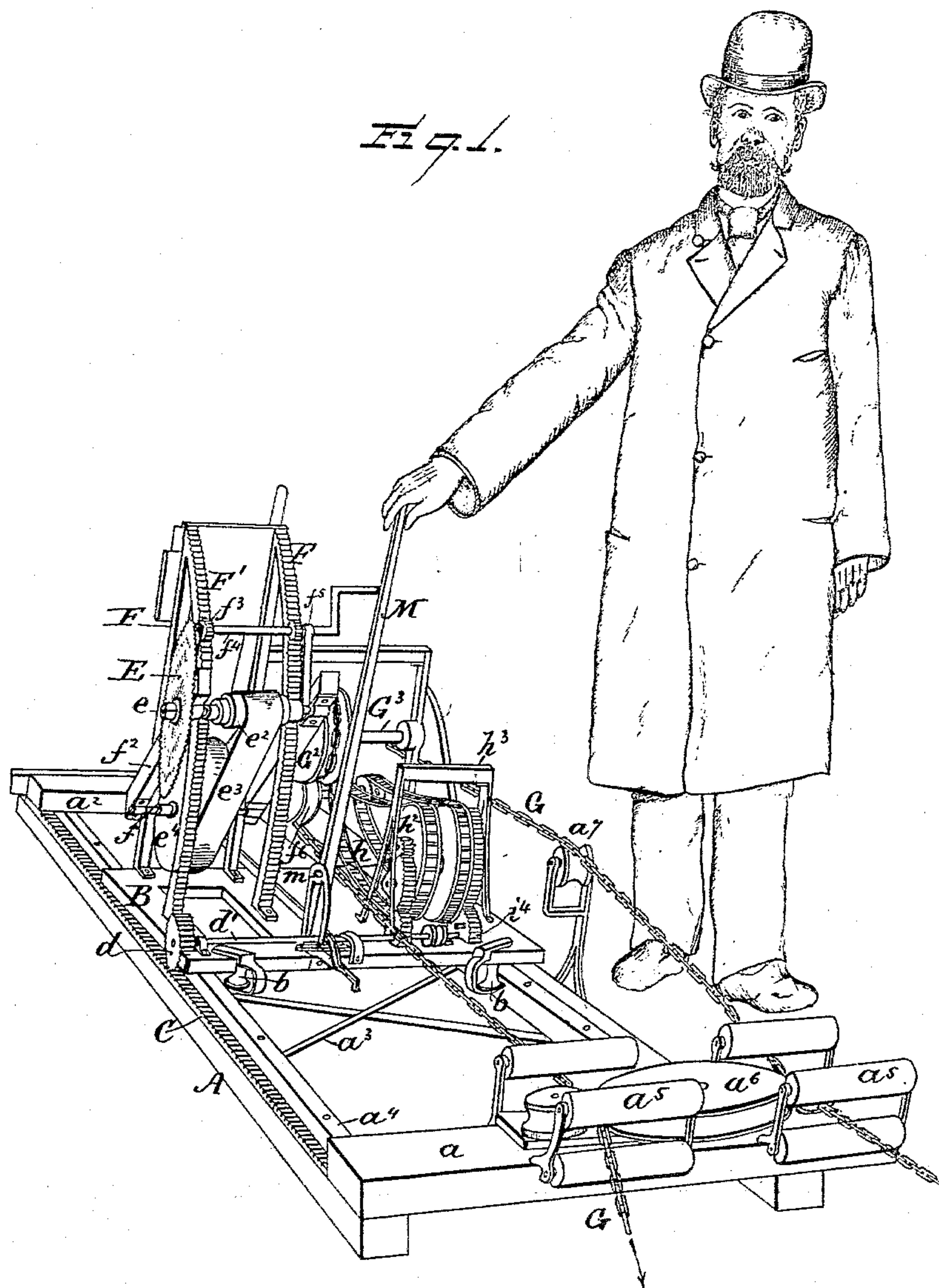
(No Model.)

2 Sheets—Sheet 1.

G. TRAHAN.
ICE SAWING MACHINE.

No. 369,415.

Patented Sept. 6, 1887.



Witnesses:
E. Sturdoman.
J. J. Masson

Inventor:
Godfrey Frahan,
by E. E. Masson
att'y.

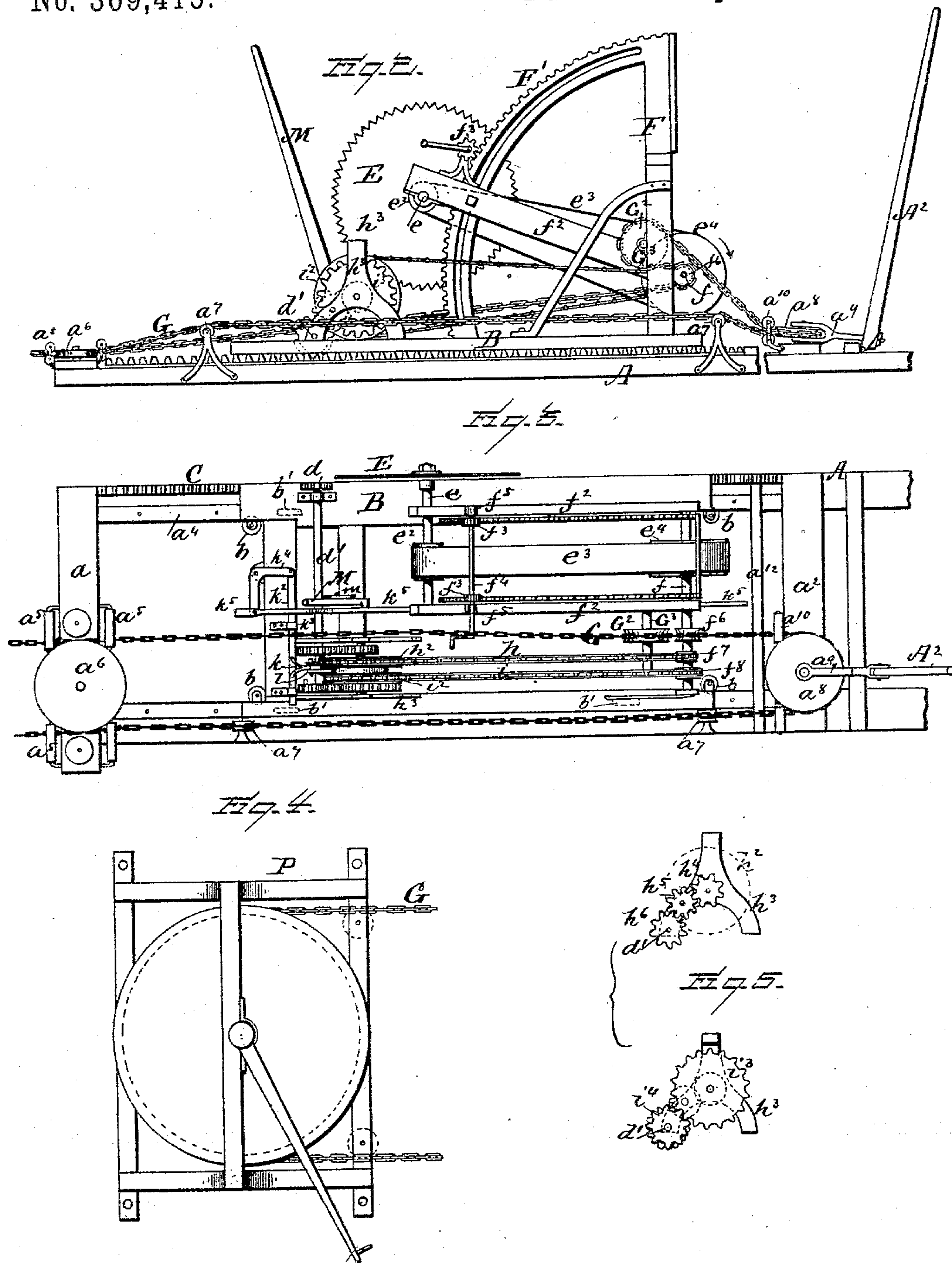
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UNITED STATES PATENT OFFICE.

GODFREY TRAHAN, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF
TO JAMES MILLS, OF SAME PLACE.

ICE-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 369,415, dated September 6, 1887.

Application filed March 19, 1887. Serial No. 231,580. (No model.)

To all whom it may concern:

Be it known that I, GODFREY TRAHAN, a citizen of the United States, residing at Brooklyn, in the county of Kings, State of New York, have invented certain new and useful Improvements in Ice-Sawing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to machines for cutting ice from rivers and ponds into rectangular blocks of convenient size for handling; and the objects of my improvement are to produce a simple, light, and inexpensive machine, capable of being operated upon either thick or thin ice, as the machine is light and does not require horses or a great many persons to be upon the ice to operate it. I accomplish these objects by the machine illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a machine constructed in accordance with my invention. Fig. 2 is a side view of the same with its supporting-track partly broken away or shortened. Fig. 3 is a top view of the same. Fig. 4 is a top view of the capstan. Fig. 5 is a side view of the arrangement of gears for working and backing the machine.

In said drawings, A represents the track, consisting of two light beams or scantlings retained parallel to each other by planks, as a^2 , secured thereto at their ends and at intermediate points. This track may be from twenty to one hundred feet (more or less) in length, although shown as much shorter in the drawings on account of want of space. Said track may be made in sections united together at their ends. The rails of said track are also connected together by diagonal braces a^3 , to stiffen them without materially increasing their weight. On top of said rails, adjacent to their inner edge, are secured flat iron rails a^4 , to produce a smooth track for the small wheel b' of the carriage to run upon. Said rails a^4 project also over the edge of the wooden rails A, to permit small wheels b upon the carriage B to engage under and prevent it leaving the track or being accidentally lifted therefrom. Upon the top of one of the rails A is also secured a cogged rail, C, adjacent to the outer edge of said rail, to engage with a pinion, d , upon one end of the shaft d' , carried by the carriage B.

This carriage consists of a rectangular frame, upon which is mounted the saw E and its operating mechanism. Said saw is carried at any desired height, as follows: Upon the carriage is secured an iron frame having two standards, F, from the top of which two segments, F' , extend toward one end of the carriage and have their lower ends secured thereto. To the forward edge of these standards is secured, in suitable boxes, a shaft, f , and to said shaft is pivoted one end of two arms, f^2 , having at their opposite ends bearings to receive the shaft e of the saw.

The outer end of the arms f^2 and the shaft of the saw are elevated by means of pinions f^3 upon a crank-shaft, f^4 , adapted to rotate in bearings f^5 , secured upon the arms f^2 . Upon the shaft e of the saw is secured a pulley, e^2 , carrying the belt e^3 , that also passes around its driving-pulley e^4 . To operate the shaft f of the latter, it carries a grooved pulley, f^6 , around which passes the driving-chain G. To cause said chain to be sufficiently wrapped or bent around the pulley f^6 to rotate it, and at the same time draw the carriage back and forth along the track, a grooved pulley, G^2 , is mounted slightly above the pulley f^6 , and in line therewith, upon a short horizontal shaft, G^3 .

The drive-chain G is endless, and passes from around a groove-pulley mounted upon a capstan or other suitably-rotated device, first, between horizontal guide-rolls a^5 on each side of guide-pulley a^6 , mounted upon the transverse plant a at the inner end of the track, and then alongside of said track upon guide-pulleys a^7 , mounted on standards secured to said track, to the farthest end of the track, where it passes around a pulley, a^8 , that is pivoted in a clevis, a^9 , connected with a lever, A^2 , having its lower end pivoted to the track. Said lever may carry a weight at its upper end, so that it will keep the chain G under uniform tension whatever may be the angle made by said chain with the capstan before entering or leaving the guide-rolls a^5 . From the pulley a^8 the drive-chain passes between horizontal guide-rolls a^{10} to the top of the pulley G^2 , and from the under side of the latter to the top of the pulley f^6 , to which it imparts its power and to the whole device, as the shaft f , carry-

ing said pulley, may be called the "main driving-shaft" of the machine. This shaft f carries a sprocket-pulley, f^7 , that transmits power by means of a chain belt, h , to a large sprocket-pulley, h^2 , carried by a short shaft mounted upon a frame, h^3 , standing upon the inner end of the carriage.

To the inner side of the pulley h^2 is mounted upon the same shaft a small pinion, h^4 , that gears with an intermediate pinion, h^5 , and the latter gears with a pinion, h^6 , upon the shaft d' , carrying the pinion d , that is in gear with the rack C, that permits the carriage to advance along the track at a slow speed while the saw is in operation.

To return the carriage at a faster speed (as generally done in planing-machines) another chain, belt, pulleys, and gears are used, as follows: Upon the shaft f is a sprocket-pulley, f^8 , that transmits power by means of a chain belt, i , to a large sprocket-pulley, i^2 , and to the outer side of said pulley is attached a cog-wheel, i^3 , that gears with the pinion i^4 upon the shaft d' . Although the chain G travels continually in the same direction it propels the carriage in both directions, alternately, by shifting the power to either one of the trains of gears above described. The shifting-fork k embraces a clutch-sleeve, l , mounted upon the shaft d' , and said sleeve has lateral rectangular projections at both ends to engage with similar projections upon the inner sides of the pinions i^4 and h^6 . The shifting-fork is secured to a rod, k^2 , that extends transversely across the carriage and is adapted to slide in guides k^3 , secured to said carriage. One end of the rod k^2 is pivoted to one arm of a bell-crank lever, k^4 , pivoted to said carriage, and the opposite arm is pivoted to the shifting-rod k^5 , that extends the length of and slightly beyond the ends of the carriage, so that when said carriage has reached one end of its course the rod will strike against the transverse bar a^{12} of the track, reverse the shifting mechanism, and the direction traveled by the carriage. When the carriage has traveled to the opposite end of its course, the opposite end of the shifting-rod k^5 strikes the opposite end bar, a , or some other stationary part of the track, and the whole shifting mechanism becomes reversed again. Although the shifter is thus automatic, it can also be controlled at any point along the course by the operator walking alongside of the carriage or riding thereon by means of the hand-lever M, as this lever is pivoted at m to a standard mounted on the carriage, and has its lower end pivoted to the shifting-rod k^5 .

On the under side of the carriage there are bearings to carry four small rollers to travel

upon the track to facilitate its advance thereon and relieve the teeth of the pinion d from pressure upon the rack C.

To operate the machine, a capstan, P, having, preferably, a large pulley thereon, is anchored upon the shore of a river or pond or upon ice of sufficient thickness, and the track A, of any desired length, is laid upon the ice intended to be cut and is pinned at both ends to said ice. The carriage being placed upon the track, the chain G passes from the capstan to and between the guide-rolls a^5 upon the guide-rolls a^7 , between the guide-rolls a^{10} , around the large end pulley, a^8 , and also around the top pulley, G^2 , and the main pulley f^6 , back to the starting-point between the roll a^5 and to the capstan, and the ends of the chain united again together. The saw is then depressed and the machine started, and a saw-cut made in the ice the whole length of the track. The machine is then brought back at a higher speed to the starting-point. The track is then slid laterally its whole length, about two feet, according to the size of cakes of ice desired and pinned at both ends to the ice thereunder, and the operation is repeated. After a width of about twenty feet has been cut, the capstan is removed laterally about twenty feet, and the operation is repeated. To cut the strips of ice transversely, the capstan is removed to a position at right angles to that it occupied in the above description, and the same operation is repeated; or, if desired, the capstan may remain stationary, and a guide-pulley may be anchored in a position at right angles to the first series of cuts and a sufficient length of chain used to connect it and the carriage with said capstan or other motive power.

Having now fully described my invention, I claim—

The combination of the frame having a rack, the saw-carriage, a driving-pinion mounted on a shaft in the carriage and engaging the rack, a shaft, also mounted on the carriage and driving the saw by belt and pulley, two sprocket-pinions on the latter shaft connected by chains to two sets of gears, a clutch for connecting the driving-pinion shaft to either one of said sets of gears, to traverse the carriage in either direction, and an endless chain operated by a windlass independently of the frame and engaging pulleys on the saw-driving shaft, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

GODFROY TRAHAN.

Witnesses:

E. E. MASSON,

E. C. WURDEMAN.