

(No Model.)

2 Sheets—Sheet 1.

C. A. SAGER.
ICE CUTTING MACHINE.

No. 247,115.

Patented Sept. 13, 1881.

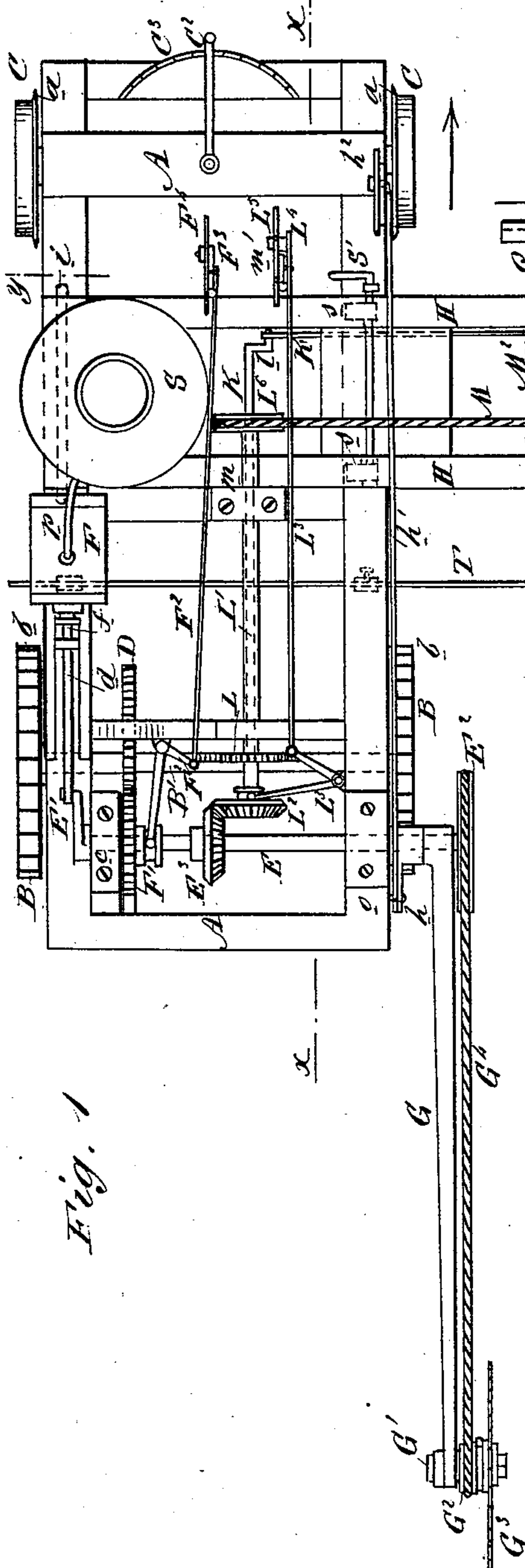


Fig. 1

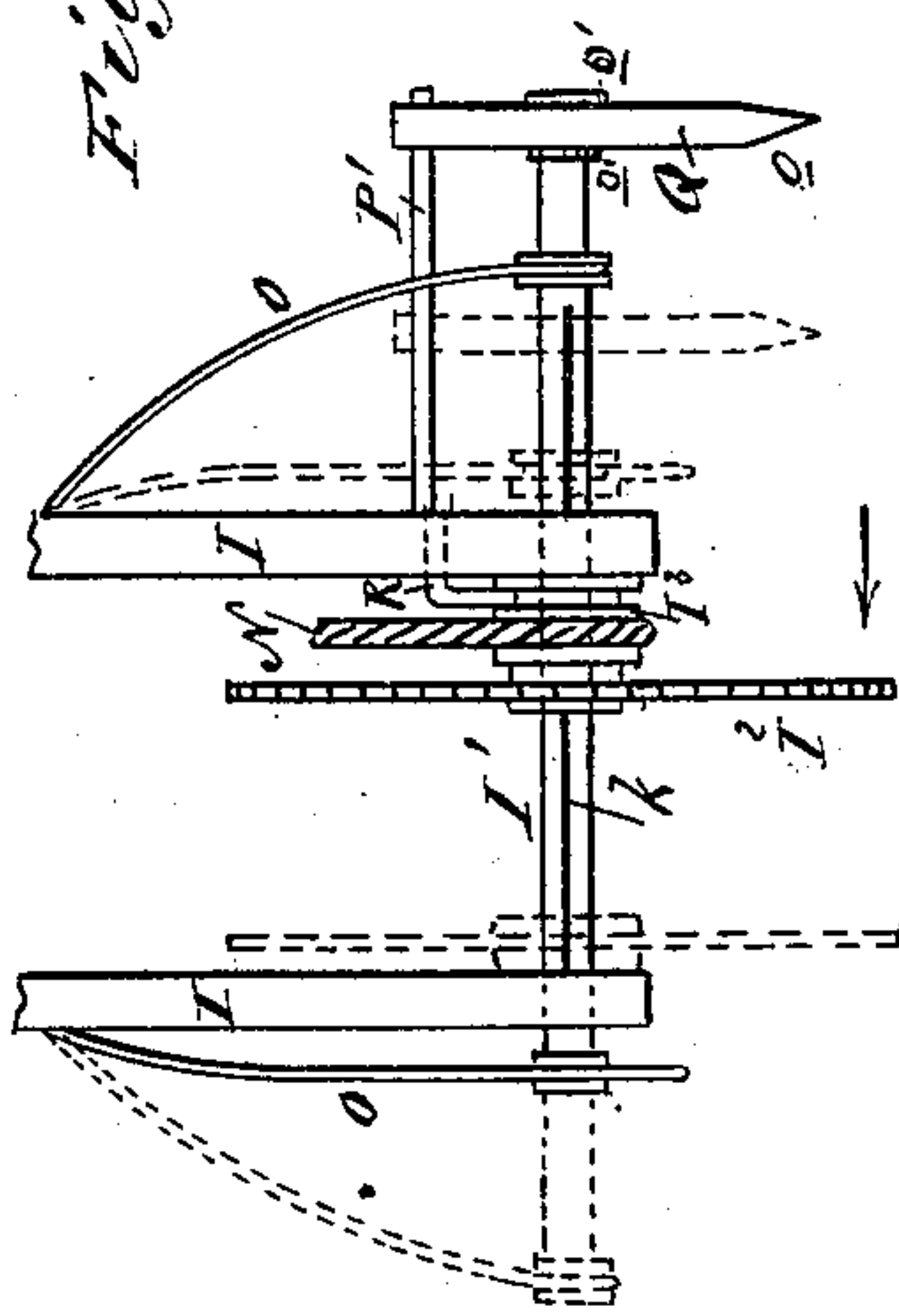


Fig. 5

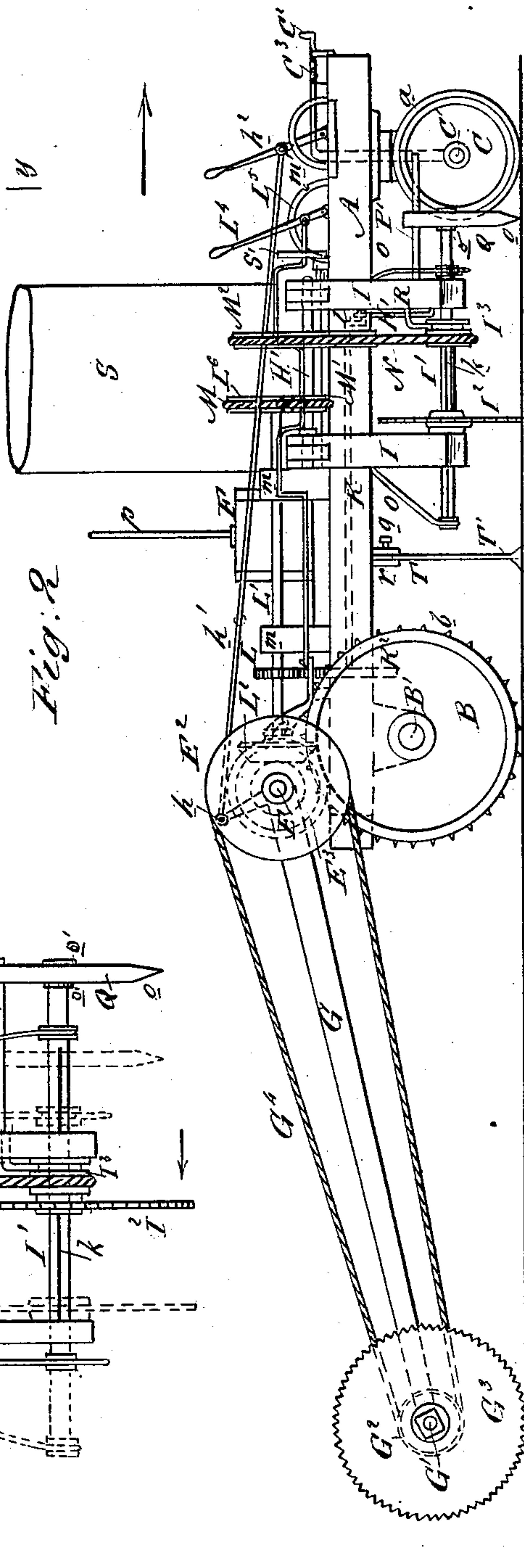


Fig. 2

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C. Sedgwick

INVENTOR:

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BY Munn & Co.
ATTORNEYS.

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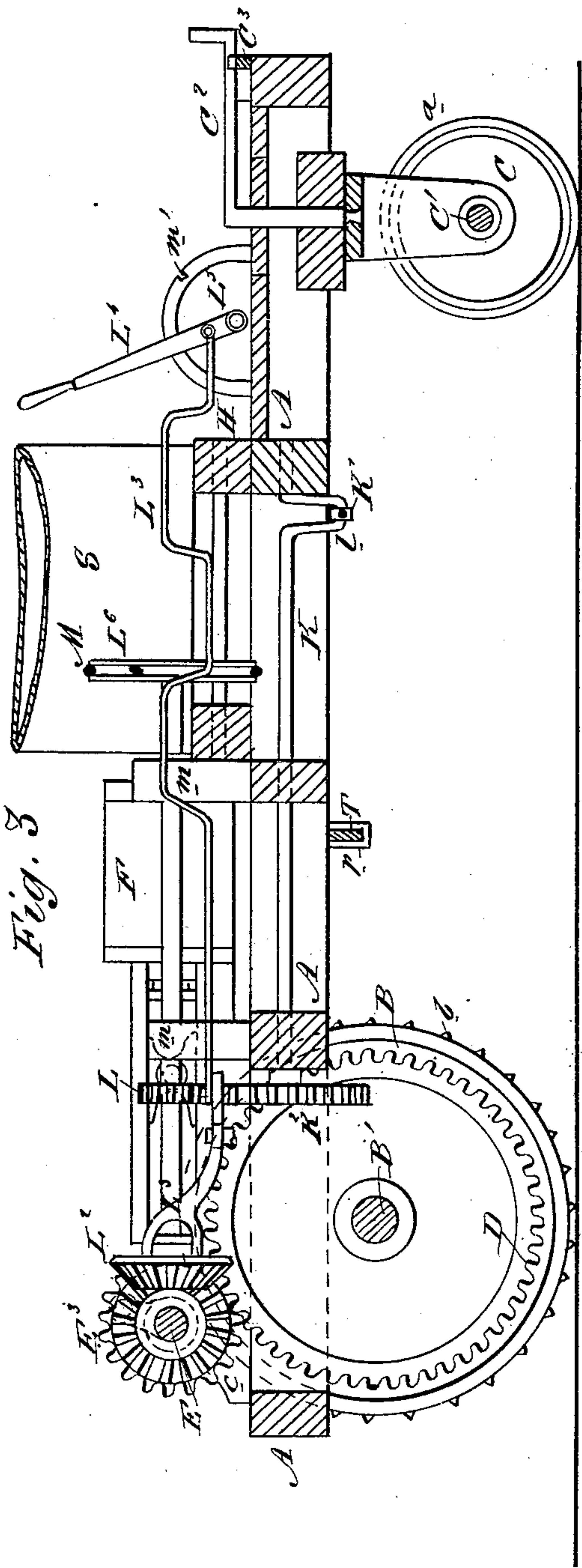


Fig. 3

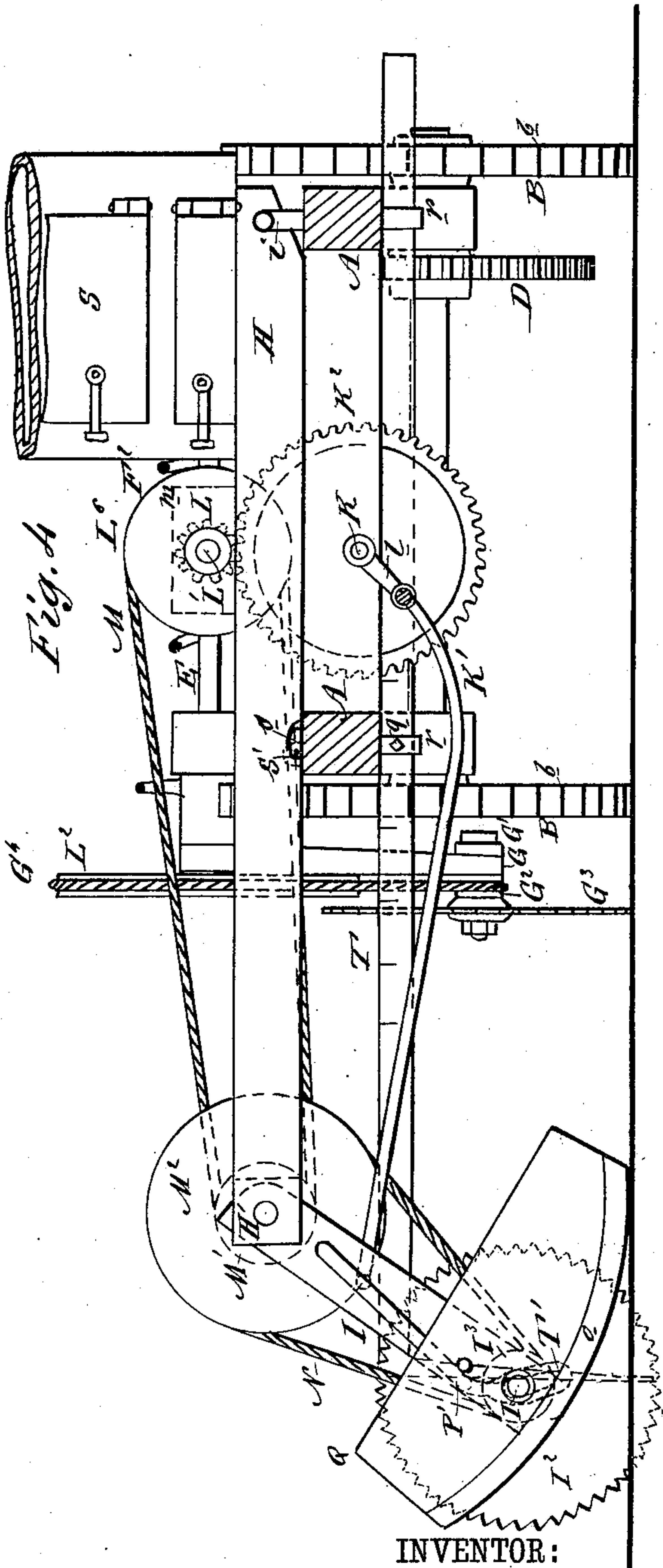


Fig. 4

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UNITED STATES PATENT OFFICE.

CHAUNCY A. SAGER, OF VALPARAISO, INDIANA.

ICE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 247,115, dated September 13, 1881.

Application filed June 28, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHAUNCY A. SAGER, of Valparaiso, Porter county, Indiana, have invented a new and useful Improved Ice-Cutting Machine, of which the following is a specification.

The object of this invention is to provide an improved machine for cutting ice lengthwise and crosswise at the same time while being drawn or propelled on the surface thereof.

The invention consists in the combination, with a traction ice-cutting machine, of a novel laterally-swinging cross-cutting device for cross-cutting the ice at right angles to the line of motion of the machine, and while the machine is in motion making longitudinal cuts, all of which will be hereinafter set forth.

Figure 1 is a plan of the improved ice-cutting machine. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged sectional side elevation of the ice-cutter on line *x x*, Fig. 1. Fig. 4 is an enlarged side elevation of the same in section on line *y y*, Fig. 1. Fig. 5 is an elevation of certain details of the mechanism.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents the frame of the machine, supported on traction-wheels and axle B B' and on guide-wheels and axle C C', fixed to the latter of which is a tiller, C², that may be held in any desired place in the notched semicircle C³ on the front of the frame A. The guide-wheels C are flanged, as shown at *a*, to enable them to cut and hold into the ice, while the traction-wheels B are spiked or roughened, as shown at *b*, to give them a better hold on the ice.

On the rear axle, B', is keyed the driving cog-wheel D.

On the top of the frame A, in boxes *c*, is journaled the crank-shaft E, on one end of which is a crank, E', and on the other end a sheave, E², said crank E' being connected by pitman *d* with the piston-rod *f* of the engine F, that is secured on the top of the frame A. On this shaft E is a cog-wheel, F', that can be thrown in or out of gear with the cog-wheel D by a clutch mechanism, F², whose controlling-lever F³ is pivoted on a standard, F⁴, near the front of the machine, and can be set in notches *g* in the edge of said standard F⁴.

When the machine is in operation the wheels B are driven by the gearing of the cog-wheel F' with the cog-wheel D, as shown in Fig. 1.

On the outer end of the shaft E, just inside of the sheave E², is secured a long swinging arm, G, parallel with the side of the frame A, reaching in rear of it, and having journaled in its free end a shaft, G', on which is keyed a sheave, G², and a circular saw, G³, which latter is designed for making the longitudinal cuts in the ice. A cord or belt, G⁴, transmits motion from the sheave E² to the sheave G², whereby the saw G³ is operated. When not desired for work, this arm G and saw G³ can be elevated by means of crank, connecting-rod, and lever *h h' h²*.

Hinged on the top of the frame A, as shown at *i*, is a frame, H, extending across the said frame A, and considerably beyond one side thereof, and transversely through the free end of this frame H is passed a shaft, H', from which depends the swing-frame I, that is movable to and from the side of the frame A. In the lower and free end of this frame I is journaled a shaft, I', on which is keyed the cross-cut circular saw I², and on which is held by keyway *k* a splined driving-pulley, I³, as shown in Fig. 5, the said shaft I' being loosely journaled, so as to be free to move endwise in its bearings.

Journaled in the cross-timbers of the frame A is a shaft, K, having on one end a crank, *l*, in which is secured one end of the connecting-rod K', whose other end is attached to the swinging frame I, for the purpose of giving said frame I and its attached saw I² their proper lateral swinging motion to and from the frame A. On the other end of this shaft K is keyed a cog-wheel, K², that gears with a corresponding cog-wheel, L, on a shaft, L', that is journaled in boxes *m* on top of the frame A. On the rear end of this shaft L' is keyed a bevel-gear wheel, L², that meshes with a corresponding bevel-gear, E³, on the shaft E, said wheel L² being moved in or out of gear with the wheel E³ by a clutch mechanism, L³, whose controlling-lever L⁴ is pivoted on a standard, L⁵, near the front of the machine, and can be set in notches *m'* in the edge of said standard L⁵. On the opposite end of this shaft L' is keyed a pulley, L⁶, from which power is transmitted by a belt, M, to the pulley M' on the shaft H', on which shaft H' is also keyed a driving sheave or pulley, M², from which motion is transmitted by belt N to the pulley I³ on the crosscut-saw shaft I', whereby said saw I² is operated.

Extending from the sides of the swinging frame I, with an outward and downward inclination, are springs O, whose lower ends are rigidly secured to the shaft I' at points some distance outside of its bearings, said springs O being designed to move said shaft I' and its attached saw I², as will be hereinafter set forth.

Projecting forward from the side of the frame I, above and parallel with the shaft I', is a rod or shaft, P', and set over and upon the ends of the shafts I' and P' is a sharp-edged shoe, Q, whose lower and sharp edge, o, is made convex, as shown in Fig. 4, and is designed to engage in the ice when the machine is in operation, as will be hereinafter set forth. Said shoe Q is fixed loosely on the shaft I and held in position by adjustable collars o', that prevent its lateral movement, while the shaft P' prevents the said shoe from rotating about the shaft I'. A bent finger or rod, R, extending downward from the frame I into an annular groove in the pulley I³, holds the latter in proper relative position to the pulley M².

S represents the steam-boiler, set on the convenient part of the frame A or on the frame H, and connected with the engine F by steam-pipe p.

The machine being propelled in the direction of the arrows, Figs. 1 and 2, the arm G and saw G³ are lowered in the positions therein shown, and the latter is made to revolve, to cut the ice longitudinally, by means of the belt G⁴. At the same time the crosscut-saw I² is engaged in the ice, and the swinging frame I is being moved back and forth by means of the connecting-rod K'. Simultaneously with the saw I² the shoe Q also engages therewith, as shown, its sharp edge o cutting a groove therein, whereby said shoe Q is prevented from lateral movement. Moved then by the rod K', the saw I² and shoe Q engage in the ice, the saw operating to cut the ice, and the shoe Q operating by its hold in the ice to firmly hold and prevent the shaft I' from endwise motion. As the saw I² is operating, cutting the ice at right angles to the cut made by the saw G³, the machine is moving forward, and the frame I moves correspondingly, carrying with it the pulley I³ on the shaft I', as indicated in Fig. 5, whereby the springs O are brought to an extreme tension. By this time the saw and shoe I² Q respectively have reached the edge of the ice and have run off; or the frames H I are elevated by cams S, and the said shoe Q being liberated from the ice, the springs O operate to force said shaft I' and said saw I² and shoe Q forward to their primary positions relative to the frame I, ready for another cut.

The frame H, and with it the swinging frame I and saw-frame I², may be elevated at will by means of cams S, fixed on a crank-shaft, S', that is journaled on the frame A beneath the frame H, as shown in Figs. 1, 2, and 4.

For gaging the distance between the longitudinal cuts in the ice, and for facilitating the making of said cuts parallel with each other,

a graduated gage, T, is held by set-screw q in boxes or clamps r on the under side of the frame A, said gage T having a downward-bent point, T', at right angles to its body, whose extremity is designed to run in a cut already made in the ice.

I do not confine myself to the precise construction of this machine as herein shown and described, it being evident that horse-power instead of steam-power may be used to operate it, and that other changes or modifications may be made without departing from my invention. I do not, however, broadly claim a crosscut-saw.

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

1. An improved ice-cutting machine constructed substantially as herein shown and described, consisting of a suitable frame mounted on wheels, and carrying a vertically-swinging arm having a longitudinally-cutting saw attached and operated by suitable mechanism, and carrying a laterally-swinging frame depending from a vertically-adjustable frame, and supporting a longitudinally-moving revolving shaft with a crosscut-saw keyed thereon, said saw and shaft being operated by suitable mechanism for cross-cutting the ice while the machine is being propelled forward, as set forth.

2. In an ice-cutting machine, the combination, with the vertically-adjustable frame H, swinging frame I, and shaft I' and crosscut-saw I², of the springs O, substantially as herein shown and described, whereby the said shaft with its saw is made to move longitudinally, as set forth.

3. In an ice-cutting machine, the combination, with the swinging frame I, shaft I', and pulley I³, of the bent finger R, substantially as herein shown and described, whereby said pulley is held in position when the shaft moves longitudinally, as set forth.

4. In an ice-cutting machine, the combination, with the swinging frame I, shaft and crosscut-saw I' I², of the shaft P' and shoe Q, arranged and operating substantially as herein shown and described, whereby said saw and saw-shaft are held in position for cross-cutting the ice while the machine is being propelled forward, as set forth.

5. In an ice-cutting machine, the combination, with the frame A, supported on traction axle and wheels B B' and guiding axle and flanged wheels C C', of the swinging arm G, carrying shaft G' and circular saw G³, operated by suitable mechanism, vertically-adjustable frame H, swinging frame I, carrying shaft I' and circular crosscut-saw I², springs O, shaft P', and shoe Q, arranged and operated substantially as and for the purposes substantially as herein shown and described.

CHAUNCEY ADELBERT SAGER.

Witnesses:

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C. W. GURNEY.