

(No Model.)

2 Sheets—Sheet 1.

W. F. VERNIER.  
ICE PLANER.

No. 437,465.

Patented Sept. 30, 1890.

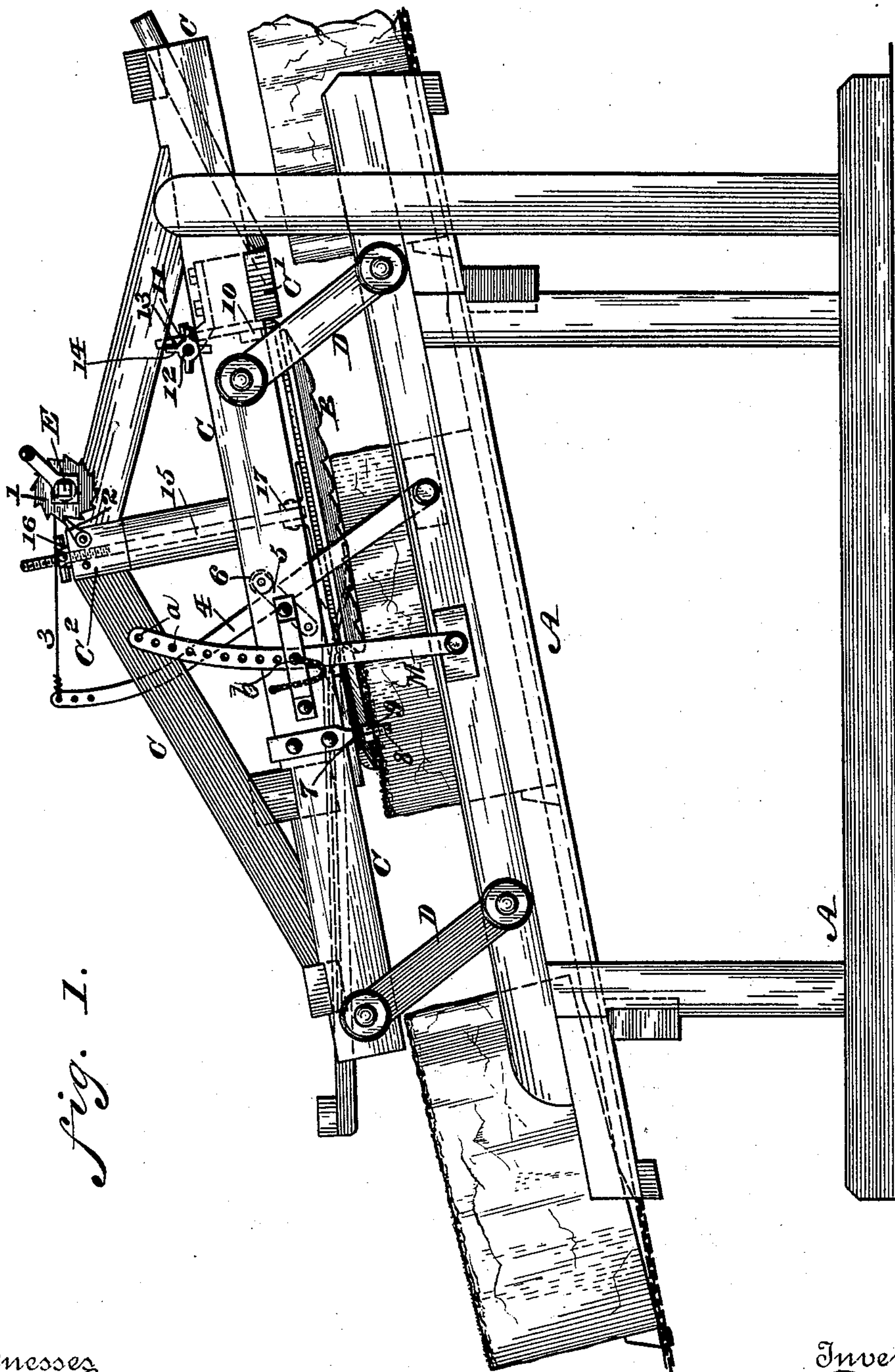


fig. 1.

Witnesses

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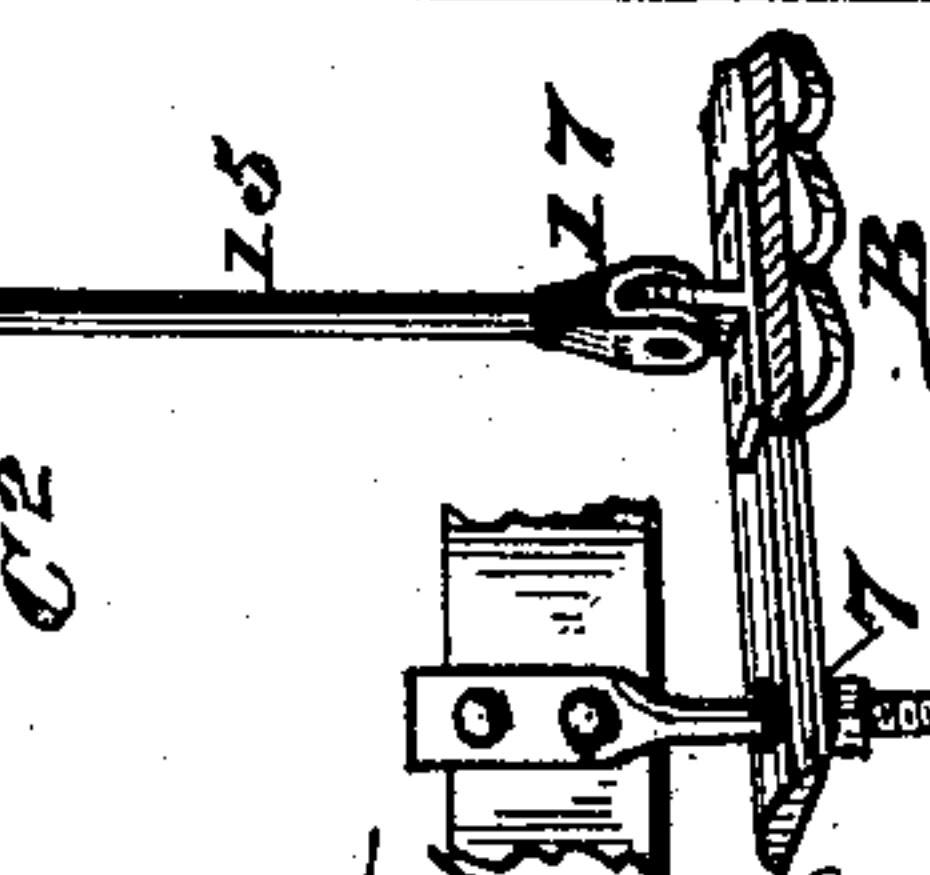
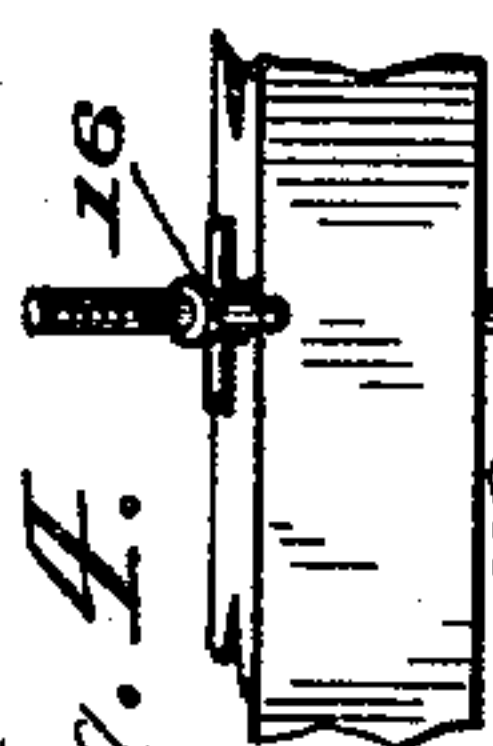
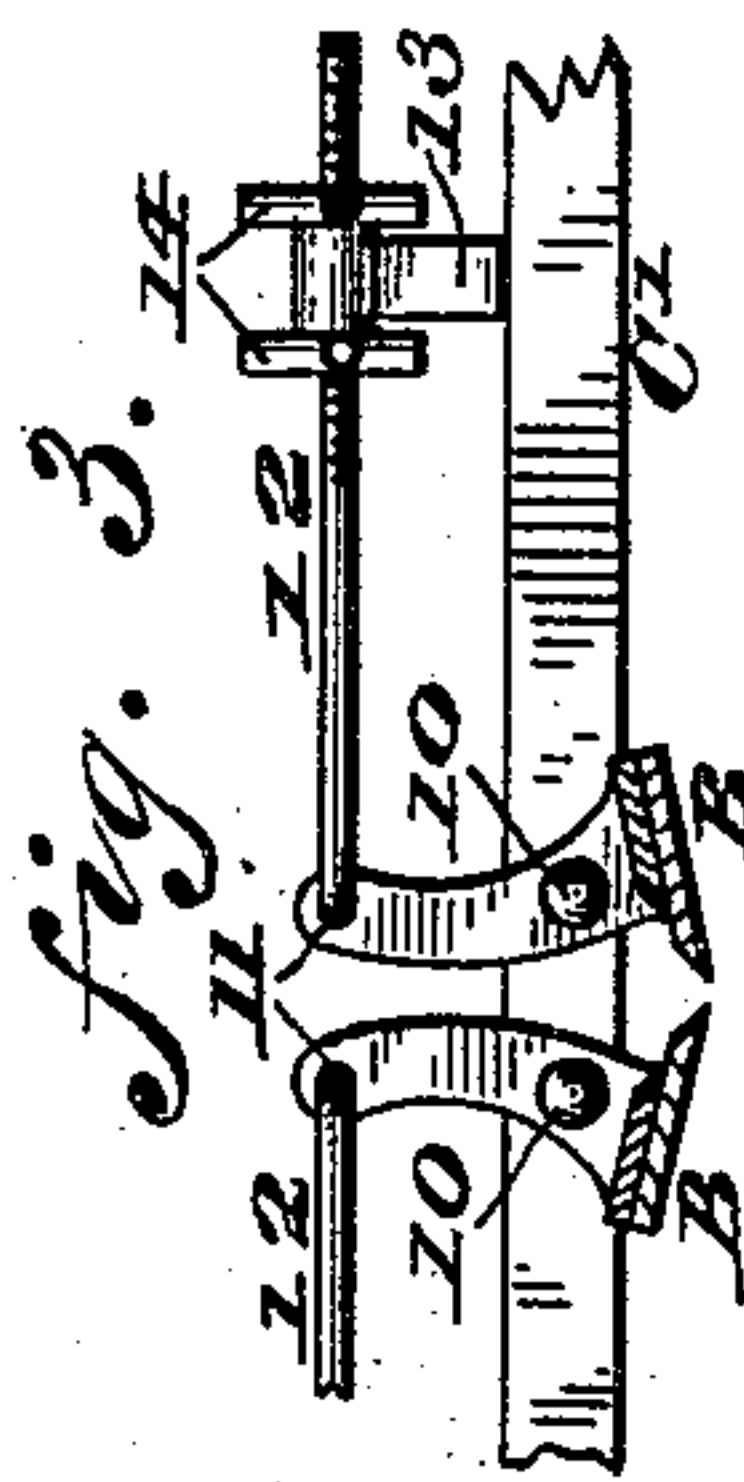
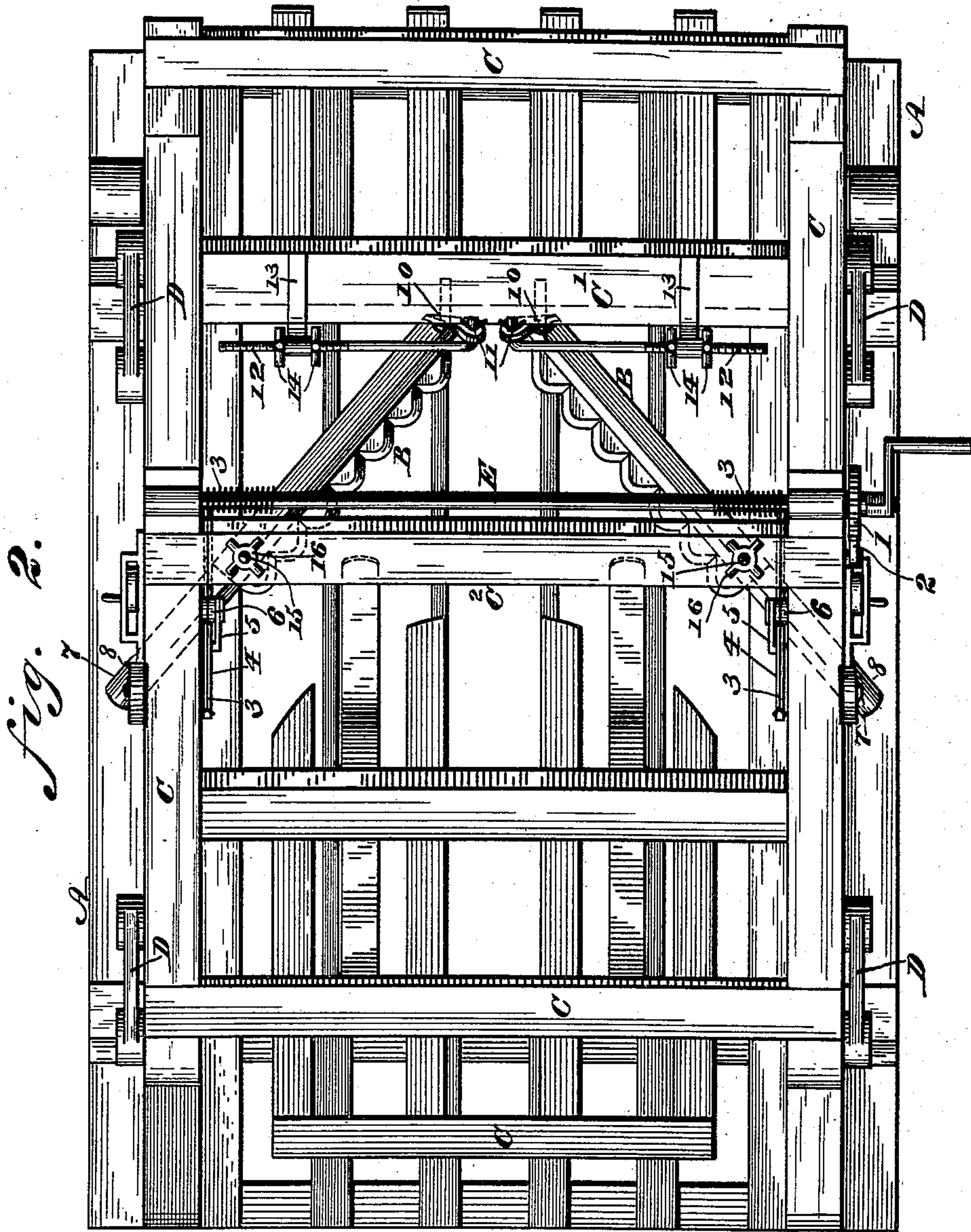
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Inventor  
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# UNITED STATES PATENT OFFICE.

WILLIAM F. VERNIER, OF PHILADELPHIA, PENNSYLVANIA.

## ICE-PLANER.

SPECIFICATION forming part of Letters Patent No. 437,465, dated September 30, 1890.

Application filed December 21, 1888. Serial No. 294,260. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM F. VERNIER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Ice-Planers, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of an ice-planer having the planer-frame adapted to automatically rise above its adjustment should a thicker piece of ice ascend the stationary frame, said planer-frame automatically returning to its normal position after said piece has passed the same.

It also consists of novel means for angularly adjusting the planer-blades independently of each other.

It further consists of the combination of parts hereinafter set forth and claimed.

Figure 1 represents a side elevation of an ice-planer embodying my invention. Fig. 2 represents a top or plan view thereof. Fig. 3 represents a sectional view of the planer-blade with side view of the adjusting mechanism at one end thereof. Fig. 4 represents a perspective view of a portion of the planer-blade, showing the sustaining-rods with connections.

Similar letters and numerals of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates the stationary frame of the plane, the same having its top extending in inclined direction or forming an inclined chute, usual in such cases.

B designates the planing-blades, which are connected with the rising and falling frame C, the latter being located above the frame A and attached thereto by means of parallel arms D, the ends whereof are pivoted respectively to the frames A and C, it being seen that as the frame C rises and falls it preserves a parallel alignment with the inclined top of the frame A.

Mounted on the frame C in the transverse direction of the same is a rotatable shaft E, which carries a ratchet 1, engaging with which is a pawl 2, hung on the frame C. To the shaft E are attached ropes or chains 3, which are also attached to the upper ends of arms 4, the lower ends whereof are pivoted to the

sides of the lower or stationary frame A, said arms passing through keepers or guides 5, secured to the sides of the movable frame C and resting against the rollers 6 at the ends of said keepers.

Pivotaly secured to the sides of the frame A are arms M, having perforations *a* therein, through which pass pins into openings in the sides of the movable frame, the pins being secured by suitable flexible connections to the said movable frame.

The operation is as follows: The shaft E is rotated so as to wind the ropes or chains 3 thereof, whereby the arms 4 are carried forward, and as said arms turn on their axis they bear upwardly against the rollers 6 of the keepers or guides 5, thus raising the frame C, so as to provide a passage between said frame and the frame A for the ascending ice, the latter coming in contact with the blades B and being planed by the same. When the frame is at the adjusted height, the pawl engaging with the ratchet prevents unwinding of the cords or chains 3, whereby said frame, and consequently the blades, retain the adjusted position. Should thicker pieces of ice ascend, they press upwardly against the under side of the frame C and lift the same, said frame readily yielding, since the cords or chains 3 form flexible connections between the shaft E and arms 4. When said thick pieces of ice clear the frame C, the latter drops and assumes its normal adjusted position.

It will be seen that owing to the leverage provided by the arms 4 the frame C may be raised by the operation of the shaft E in a convenient and comparatively easy manner, avoiding expenditure of great power on said shaft.

The blades are connected with the frame C so as to be farther apart at their lower ends, where they receive the ice, than at their upper ends, said lower ends being rounded on their upper faces and having slots 7, through which pass the vertical bolts 8, which latter are connected with the frame C and provided with nuts 9, whereby the blades are supported and may readily turn on the bolts 8 for angular adjustment. The upper ends of the blades are pivoted to one of the cross-bearings C' of the frame C, as at 10, and above their



pivots are formed with eyes 11, to which are attached the transversely-extending rods 12, which are screw-threaded and freely engage with ears 13, secured to said beam C. On each rod, on opposite sides of the ear thereof, are nuts 14, whereby by properly rotating the nuts the rods may be drawn toward each other or moved from each other. By this provision the blades may be nicely adjusted in angular directions relatively to the plane of the inclined top of the frame A, and when they are thus adjusted they may be prevented from shifting by tightening or jamming the proper nuts against the ears 13.

15 In order to sustain the blades intermediate of their ends, I employ screw-rods 15, which are connected at top with the beam C<sup>2</sup> of the frame C by means of nuts 16 and at bottom by knuckle-joints 17 with the blades, it being  
20 seen that as the blades turn during the operation of adjusting the same, the knuckle-joints 17 permit the turning motions of the blades, without depriving the rods 15 of their office of supporting said blades at the places where  
25 they are connected.

The arms M and the pin *b* are not employed when it is desired to allow the movable frame to be free to automatically adjust itself to accommodate ice of different thicknesses.

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

1. In an ice-planer, a stationary frame, a rising and falling frame carrying a planer-blade, and arms pivoted to the stationary frame and connected by a rope or chain, with means for raising and lowering the same, the said arms riding in bearings on the rising and falling frame, said parts being combined  
40 substantially as described.

2. In an ice-planer, a stationary inclined

frame and a rising and falling frame, the latter carrying planer-blades angularly adjustable relative to the plane of the inclined frame, said parts being combined substantially as described. 45

3. In an ice-planer, a stationary frame with inclined top, a movable frame above said stationary frame, planer-blades having their upper ends pivotally secured to said movable frame and the upper faces of the lower ends rounded, and bolts passing through said lower ends and secured to the movable frame, said parts being combined substantially as described. 50 55

4. In an ice-planer, a planer-blade angularly adjustable on the frame carrying the same, in combination with a rod supporting said blade and connected with the same by a knuckle-joint, substantially as described. 60

5. In an ice-planer, a stationary frame, a movable frame, planer-blades having pivotal connection at their upper ends and at their lower ends a bolt-connection with said movable frame, ears secured to the movable frame, and threaded rods secured to the pivoted ends of the blades and having nuts working on said rods, said parts being combined substantially as and for the purpose set forth. 65

6. In an ice-planer, a stationary frame, a movable frame, parallel arms pivoted to said frames, a winding-shaft above said frames, arms pivoted to the stationary frame, keepers in which said arms are guided, connections for the ends of said arms and shaft, and rollers against which said arms bear, said parts being combined substantially as described. 70 75

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Witnesses:

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