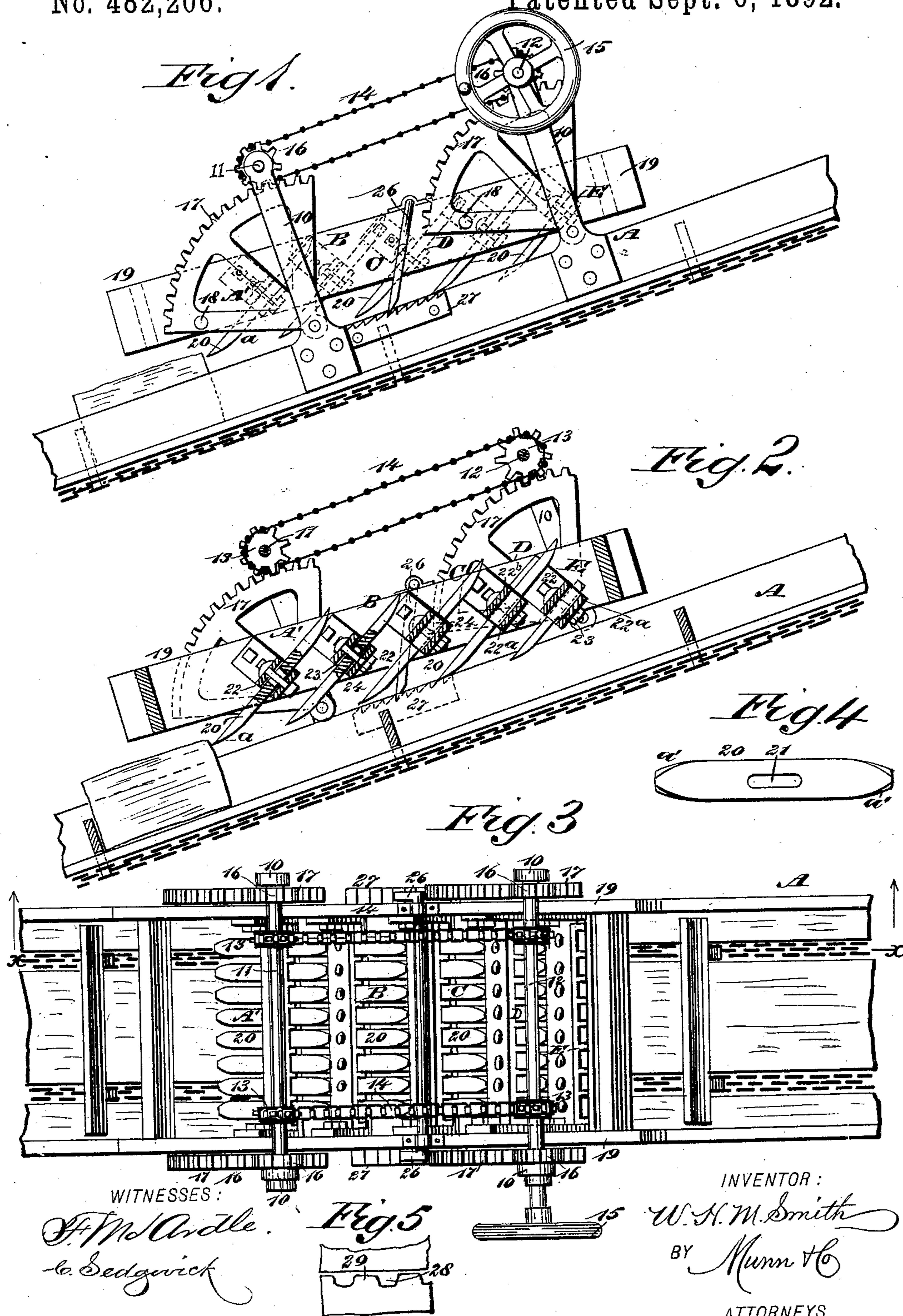


(No Model.)

W. H. M. SMITH.  
PLANER FOR ICE ELEVATORS.

No. 482,206.

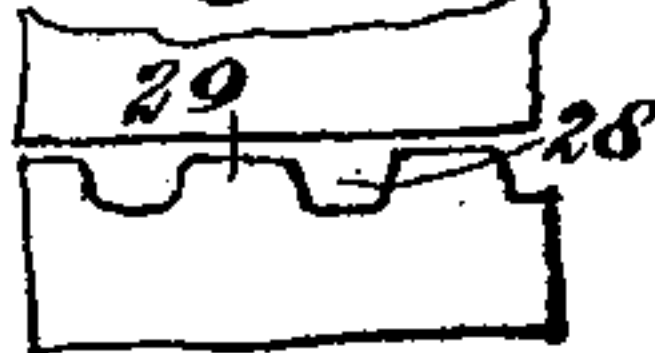
Patented Sept. 6, 1892.



WITNESSES:

*H. M. Apple*  
*C. Sedgwick*

*Fig. 5*



INVENTOR:

*W. H. M. Smith*  
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ATTORNEYS



# UNITED STATES PATENT OFFICE.

WILLIAM H. M. SMITH, OF BROOKLYN, NEW YORK.

## PLANER FOR ICE-ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 482,206, dated September 6, 1892.

Application filed December 22, 1891. Serial No. 415,853. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. M. SMITH, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful  
5 Improvement in Planers for Ice-Elevators, of which the following is a full, clear, and exact description.

My invention relates to a machine for planing ice, and has for its object to provide an  
10 arrangement of knives capable of being adjusted to and from the ice in such a manner as to bring a set or a series of knives into engagement with a block of ice carried beneath the planer, and also to provide a means  
15 whereby any one or two sets of knives can be brought into operation.

A further object of the invention is to so cut or plane the surfaces of the blocks of ice that the inferior or snow ice upon the top of  
20 the block will be removed by producing therein a series of channels spaced so as to receive "lands" between them, whereby the blocks of ice when piled one upon another in an ice-house will have currents of air passing be-  
25 tween them and whereby, also, the ice that will melt will be that portion forming the lands of the blocks, which portions are undesirable. By this means the solid portions of the blocks of ice may be kept intact in an ice-  
30 house, and the waste of good ice is thereby reduced to a minimum.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and  
35 pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the  
40 views.

Figure 1 is a side elevation of the planer, illustrating it as connected with a portion of the ice-elevator. Fig. 2 is a central longitudinal section through the planer and through  
45 that portion of the elevator supporting it, the section being practically taken upon the line  $xx$  of Fig. 3. Fig. 3 is a plan view of the planer. Fig. 4 is a detail plan view of one of the knives. Fig. 5 illustrates the manner in  
50 which the ice blocks are cut and the manner in which they are piled one upon the other.

The elevator A, which carries the ice from

the pond or from any predetermined point into the ice-house, may be of the usual or of any approved construction. Upon the sides  
55 of the elevator at a convenient point thereon standards 10 are erected, two standards being attached to each side of the elevator, one transversely opposite the other. In the upper  
60 ends of these standards two shafts 11 and 12 are journaled, and upon these shafts sprocket-wheels 13 are secured, two sprocket-wheels being usually attached one at each side of the  
65 center of each shaft, and the opposing sprocket-wheels upon the shafts are connected by chain belts 14. One of the shafts—for instance, the shaft 12—has attached to its outer  
70 end a hand-wheel 15, whereby the shaft may be readily rotated; but an equivalent device may be substituted for the wheel.

Near each end of each shaft a pinion 16 is secured, and these pinions engage with the  
75 toothed surfaces of segmental racks 17 or mutilated gears, the racks or gears being pivoted at their centers one to the inner face of each standard 10. The racks are connected  
80 by pins 18 or the equivalents thereof with a frame 19, the said frame being preferably of a rectangular shape. This frame constitutes the body of the planer and is adapted to carry  
85 knives.

The knives 20 are double-pointed, one of them being shown in detail in Fig. 4. The  
90 under faces of the cutting-edges of the knives are beveled, as illustrated at  $a$  in Figs. 1 and 2, and the side surfaces of the cutting-edges of the knives at the top are also beveled, as  
95 illustrated at  $a'$  in Fig. 4, and each knife is provided at its center with a longitudinal slot 21. The knives are arranged in transverse series a slight distance apart, and any desired  
100 number of series may be employed. In the drawings five series of knives A', B, C, D, and E are illustrated. The knives are located in heads 22, the said heads consisting, preferably, of a lower bar 22<sup>a</sup>, provided with open-  
ings for the passage of bolts 23, and an upper bar 22<sup>b</sup>, which bar is provided with openings, also for the reception of the bolts, and with  
transverse ribs 24 upon the under face, the  
said ribs being adapted to engage with the  
bar 22<sup>a</sup>. The ribs upon the upper bar 22<sup>b</sup> divide the heads into a series of compartments,  
each of which is shaped and fitted to receive



a knife 20. The heads are preferably attached to the frame through the medium of straps projected upward from their sides, and each head is so attached and inclined upon the frame that the first series of knives will be at the lower cutting-edges the nearest to the body, the second set being slightly lower, the third lower still, and the last set or series of knives the lowest of all. The frame of the planer is adapted to be held at all times at an inclination to the elevator. Therefore the upper rack or mutilated gear 17 is connected with the side of the frame at a much higher point than the lower rack or gear. Thus when all the knives are to be brought into operation the adjustment is made somewhat as shown in Fig. 1, in which it will be observed that the forward series of knives A' at their lower cutting-edges are elevated some distance above the elevator, while the rear set of knives E extends downward between the side pieces of the elevator. If but four sets of knives are to be brought into operation, the lower end of the planer-body is adjusted higher, and this adjustment is carried out to bring any two sets or even one set of knives only into operation. The adjustment of the body of the planer is effected by the manipulation of the hand-wheel 15, and through the medium of the shaft 12, upon which that wheel is located, movement is imparted to the other shaft 11, and both shafts communicate movement to the segmental racks 17 in a manner either to raise or to lower the body of the planer. In order that the body when adjusted will not slip while the knives are cutting, pawls 26 are pivoted one at each side of the body, which pawls are adapted to engage with racks 27, secured to the outer faces of the elevator sides. As the cake of ice is drawn up the elevator it is engaged by the first series of knives, set to engage with it, and a portion of its upper face is removed. It then passes to the second series of knives and a further portion is removed, and so on until the last series of knives is passed, at which time all of the undesirable material to be removed from the block of ice will have been taken from it, and the blocks of ice will be so cut that a series of channels between each channel an elevated surface or land 29 will be produced. Thus all the frozen snow or other undesirable matter contained in a block of ice will be removed, and the blocks of ice by having one of their faces grooved or channeled may be packed to better advantage in an ice-house than can blocks of ice cut in the ordinary manner, as a circu-

lation of air may be obtained between the blocks resting one upon the other and that portion of the block that would naturally melt if such action takes place will be the undesirable portion. It will be further observed that by planing the ice with a series of knives set in graduated positions, so as to cut one series after the other, the ice will not be spalled or cracked while its face is being dressed, as often happens when one cut only is employed to remove the undesirable surface from the blocks.

I desire it to be distinctly understood that if in practice it is found desirable instead of a series of knives being placed in each head a head may carry one or more knives only; but preferably each head is made to carry a number of knives, and, as heretofore stated, in the arrangement of the knives they are arranged one behind the other.

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

1. In an ice-planer, the combination, with an elevator, of a planer-body held at an inclination above the elevator and provided with several series of knives one in rear of the other, the knives of the several series being in alignment, means for adjusting the inclination of the planer-body, and means for locking it in the position to which it has been adjusted, substantially as described.

2. In an ice-planer, the combination, with supports, of segmental racks pivoted to said supports, a planer-body secured to the said racks, pinions meshing with said racks, and means for operating the pinions, substantially as described.

3. In an ice-planer, the combination, with supports, of segmental racks pivoted to said supports, a planer-body secured to the racks, pinions meshing with the racks, sprocket-wheels on the shafts of the pinions, chain belts passing over the sprocket-wheels, and a crank on one of the pinion-shafts, substantially as described.

4. In an ice-planer, the combination, with an elevator, of pivoted segmental racks, a planer-body secured to the racks, pinions meshing with said racks, means for operating the pinions, racks secured to the elevator, and pawls pivoted to the planer-body and engaging the racks on the elevator, substantially as described.

WILLIAM H. M. SMITH.

Witnesses:

OSBORN EARING,  
CLARENCE SEAMAN.