

(No Model.)

2 Sheets—Sheet 1.

J. E. RICHARD.
MACHINE FOR CRACKING ICE.

No. 475,518.

Patented May 24, 1892.

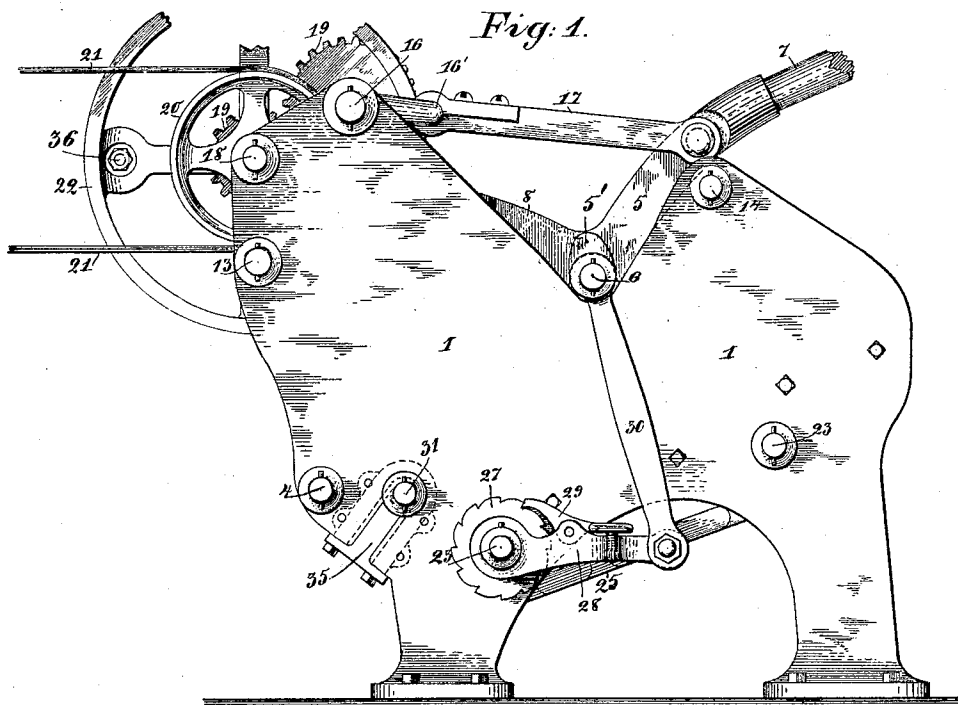
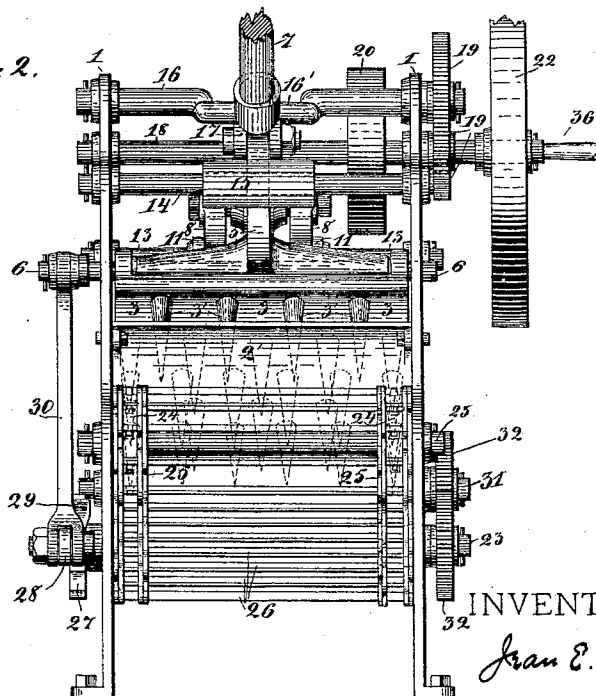


Fig. 2.



WITNESSES:

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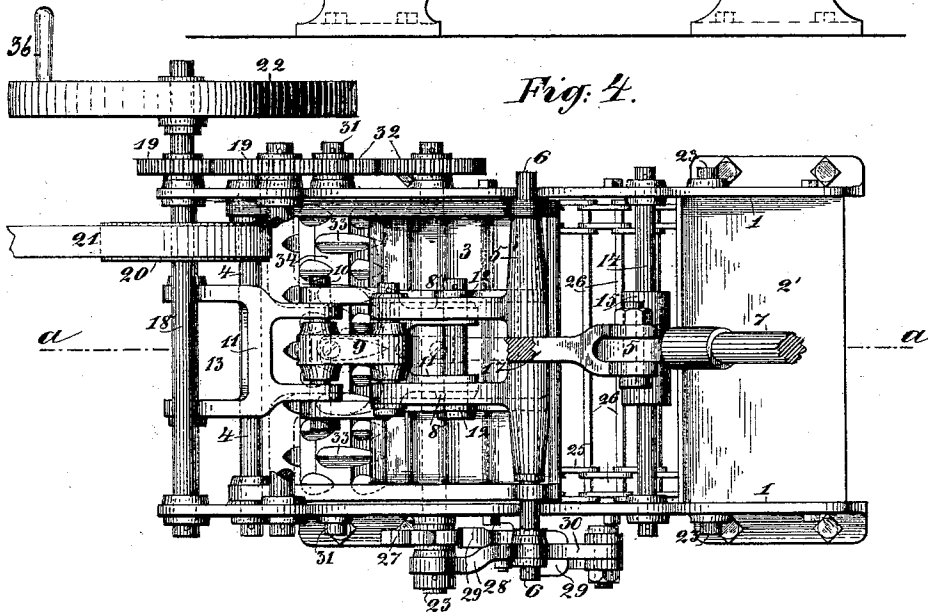
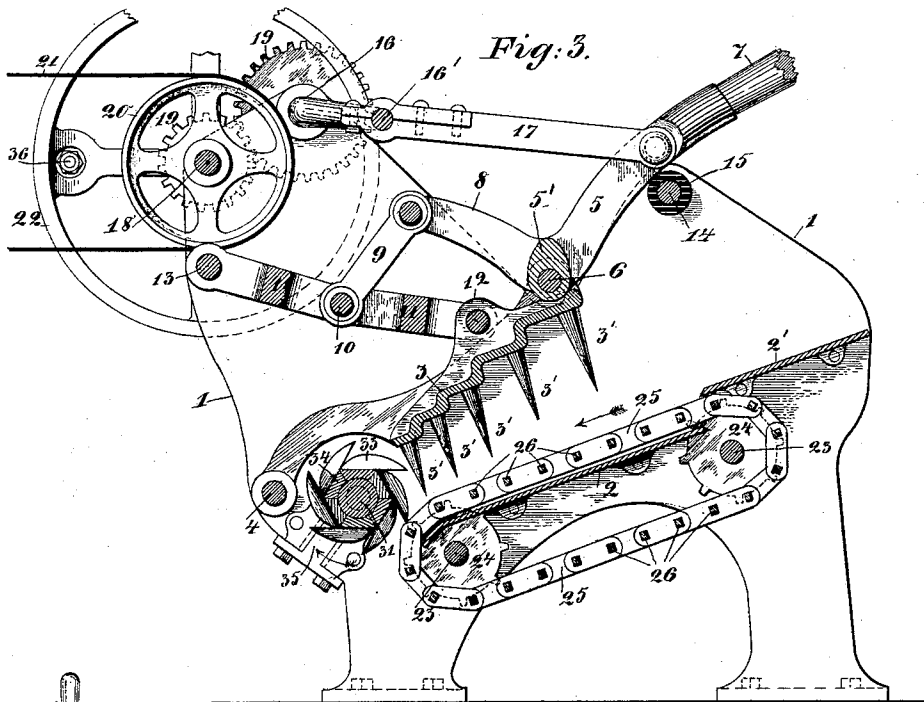
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INVENTOR:

John E. Richard

By *Henry Combs*

Attorney.

WITNESSES:

Herbert Blopp
Chas. T. Barker

UNITED STATES PATENT OFFICE.

JEAN E. RICHARD, OF NEW YORK, N. Y., ASSIGNOR TO JOHN SCOTT.

MACHINE FOR CRACKING ICE.

SPECIFICATION forming part of Letters Patent No. 475,518, dated May 24, 1892.

Application filed August 17, 1891. Serial No. 402,931. (No model.)

To all whom it may concern:

Be it known that I, JEAN E. RICHARD, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain Improvements in Machines for Cracking Ice, of which the following is a specification.

My invention relates to the class of machines employed for breaking up or cracking ice for the use of ice-cream makers, bar-rooms, families, &c.; and the object is to produce a simple and effective machine at a moderate cost and one that may be operated either by power or by hand, as desired.

One important feature of the machine is the employment of an auxiliary cracking mechanism for the reduction of the bits of ice to a somewhat uniform small size, and another is the employment of means for carrying the cracked ice out of the machine.

In the drawings which serve to illustrate my invention, Figure 1 is a side elevation of a machine embodying my invention, the left-hand side being shown. Fig. 2 is an end elevation, the feed end, which is at the right hand in the other figures, being shown. Fig. 3 is a vertical longitudinal section taken substantially in the plane indicated by line *a a* in Fig. 4. Fig. 4 is a plan of the machine, some portions of the upper mechanism, which will be indicated hereinafter, being omitted.

1 1 represent the two side frames of the machine, which are connected together by two slightly-inclined beds 2 and 2'. Over the bed 2 is arranged a vibrating frame or jaw 3, which is pivoted in the frame on a tie bar or rod 4. This jaw 3 is provided with teeth 3' on its under side, which project downward toward the bed 2 and may stand with their axes at about a right angle therewith. Fig. 3 shows the jaw 3 depressed to its fullest extent, and when in this position the points of the teeth of the several rows of teeth thereon stand at different distances from the bed 2, the row of teeth farthest to the right in this figure and which are nearest to the feeding end of the machine having their points farthest from the bed, while the points of the teeth in the succeeding rows, going toward the delivery end of the machine, approach nearer to the bed. This construction causes the block of ice to be reduced gradually to

bits. The jaw 3 may be vibrated or moved up and down either by hand or by power, and I have shown means for operating in both ways. 55

A lever 5, having a tubular boss 5', is coupled to the jaw 2, through the medium of a cross shaft or bar 6, which extends through said boss and has bearings in flanges turned upon the jaw, and this lever 5 may be provided with a suitable prolonging handle 7, (partly broken away in the drawings,) which fits in a socket in the lever 5. On the boss 5', which is or may be integral with the lever 5, are two arms 8, which are coupled by a 65 link 9 to the knuckle 10 of a toggle 11, the latter being coupled at one extremity to the jaw 3 at 12 and at the other extremity to the main frame through the medium of a cross-bar 13. When the lever 5 is raised, it acts 70 directly on the jaw 3 to raise it and indirectly, also, through the toggle to raise it, and when the lever is depressed the toggle acts with great force to depress the jaw on the ice. In other words, the lever serves to put the toggle 75 into action for depressing the jaw, and at the same time the pressure on the fulcrum of the lever (at shaft 6) is also applied to the depression of the jaw. Across the frame of the machine at the proper point is a bar 14, on 80 which may be placed a cushion 15 to serve as a stop to limit the downward movement of the lever and jaw.

In order to operate the jaw 3 by power, if this be desired, a crank-shaft 16 is rotatively 85 mounted in the frame and the crank 16' therein coupled by a connecting-rod 17 to the lever 5. The crank-shaft is driven from a shaft 18, also rotatively mounted in the frame, through the medium of toothed wheels 19, 90 fixed on the respective shafts. On the shaft 18 is a pulley 20, whereby said shaft may be driven by a belt 21, and a fly-wheel 22 may also be mounted on said shaft to perform the usual functions of such a wheel. 95

In the frame below the bed 2 are mounted two shafts 23 and 23', on which are secured sprocket-wheels 24, which carry down over the bed an endless apron, composed of two 100 endless chains 25, with bars 26 extending across from chain to chain. This apron carries off the ice as it is cracked, being moved downwardly over the surface of the bed intermittently, or whenever the jaw 3 is raised,

by means of mechanism I will now describe, with especial reference to Figs. 1 and 3. On the shaft 23 is secured a ratchet-wheel 27, and on said shaft is arranged to swing radially a pawl-arm 28, which carries a spring-pawl 29, the operative end of which engages the teeth of the ratchet-wheel 27. The pawl-arm is coupled by a link 30 to the projecting extremity of the bar or shaft 6, whereby, whenever the jaw is raised the pawl is made to act upon and impart a partial rotation to the ratchet-wheel and through it to move the apron over the bed 2.

So far as described the operation is as follows: The block or lump of ice is placed in the machine on the bed 2' and pushed under the jaw 3 onto the endless apron. When the jaw descends, the teeth thereon penetrate the ice and crack it, and when the jaw is raised the endless apron moves downward over the bed 2, carrying the bits of ice toward the delivery end of the machine. The downward movement of the jaw alternates with the forward movement of the endless apron, the latter being stationary when the jaw is operating. In order to further reduce the broken ice and to insure that the larger bits shall not exceed a certain size, I provide the machine with an auxiliary cracker, which I will now describe. Near the lower end of the endless delivering-apron is rotatively mounted in the frame a shaft 31, which is driven from the shaft 23 by ordinary toothed gear-wheels 32. (Seen in Fig. 4.) On the shaft 31 are fixed gangs or series of cutters or teeth, the points of which play close to the endless apron at the point where it leaves the bed 3, which is the delivering-point. In order that the rows or gangs of teeth on the shaft 31 may be varied in number at will and also to simplify the construction, I prefer to cast the teeth 33 in segment-bars 34 and to secure these bars to the shaft. In Fig. 3 six of these bars are shown; but there may be more or less than six. This shaft 31, together with the gangs of teeth thereon, may be readily removed at will, as it is held in place in its bearings by blocks 35. (Clearly shown in Figs. 1 and 3.) When these blocks are removed, the shaft 31 may be drawn down and out of the open slot-like bearings in the frame.

It will be obvious that if the machine is to be operated by hand only, the power-shaft, crank-shaft, and connecting-rod 17 may be omitted entirely; or, on the other hand, if power only is to be used, the prolonging handle 7 will not be required. In the plan, Fig. 4, the crank-shaft and the rod 17 are partly broken away.

The cushion 15 is not essential and might be omitted. There should be, however, some form of stop to arrest the downward movement of the lever 5 in case hand-power is employed to actuate the jaw 3.

I have shown, Fig. 1, the ratchet-wheel 27 as having coarse or large teeth; but the teeth may be fine or numerous and the link 30 may be coupled adjustably to the arm 28 in a well-known way, so that the pawl 29 will impart at each movement more or less movement to the endless apron, according to its adjustment. This mode of making ratchet mechanisms adjustable is too common to require special illustration.

In lieu of using the lever prolongation or handle 7 for operating the jaw 3, the fly-wheel 22 may be furnished with a crank, as indicated at 36 in Fig. 1.

Having thus described my invention, I claim—

1. In a machine for cracking ice, the combination, with a supporting-frame, and a bed therein to receive the block of ice, of a toothed jaw arranged over said bed and pivoted in the frame, the lever 5, fulcrumed in bearings in said jaw and provided with an arm 8, a toggle 11, coupled at one end to the frame and at the other to said jaw, and a link 9, which couples the arm 8 of the lever to the knuckle of said toggle, as set forth.

2. In an ice-cracking machine, the combination, with a supporting-frame, and the inclined stationary beds 2 and 2', arranged at different levels, as described, of an endless apron, composed of transverse bars with spaces between them, arranged to travel intermittently over the bed 2, the pivoted cracking-jaw over said bed 2, and the apron, and means, substantially as described, for actuating said apron when the jaw is raised, as set forth.

3. In a machine for cracking ice, the combination, with the supporting-frame, the bed arranged therein to receive the ice, the intermittently-moving apron which travels over said bed, and the vibrating cracking-jaw arranged over said apron and bed, of the shaft 31 at the delivering end of the machine, provided with teeth for reducing the cracked ice, and means for rotating said shaft, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JEAN E. RICHARD.

Witnesses:

HENRY CONNETT,
HERBERT BLOSSOM.