July 12, 1938. P. A. EYRICK ET AL 2,123,827

ICE CRUSHER

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Fig. 1.

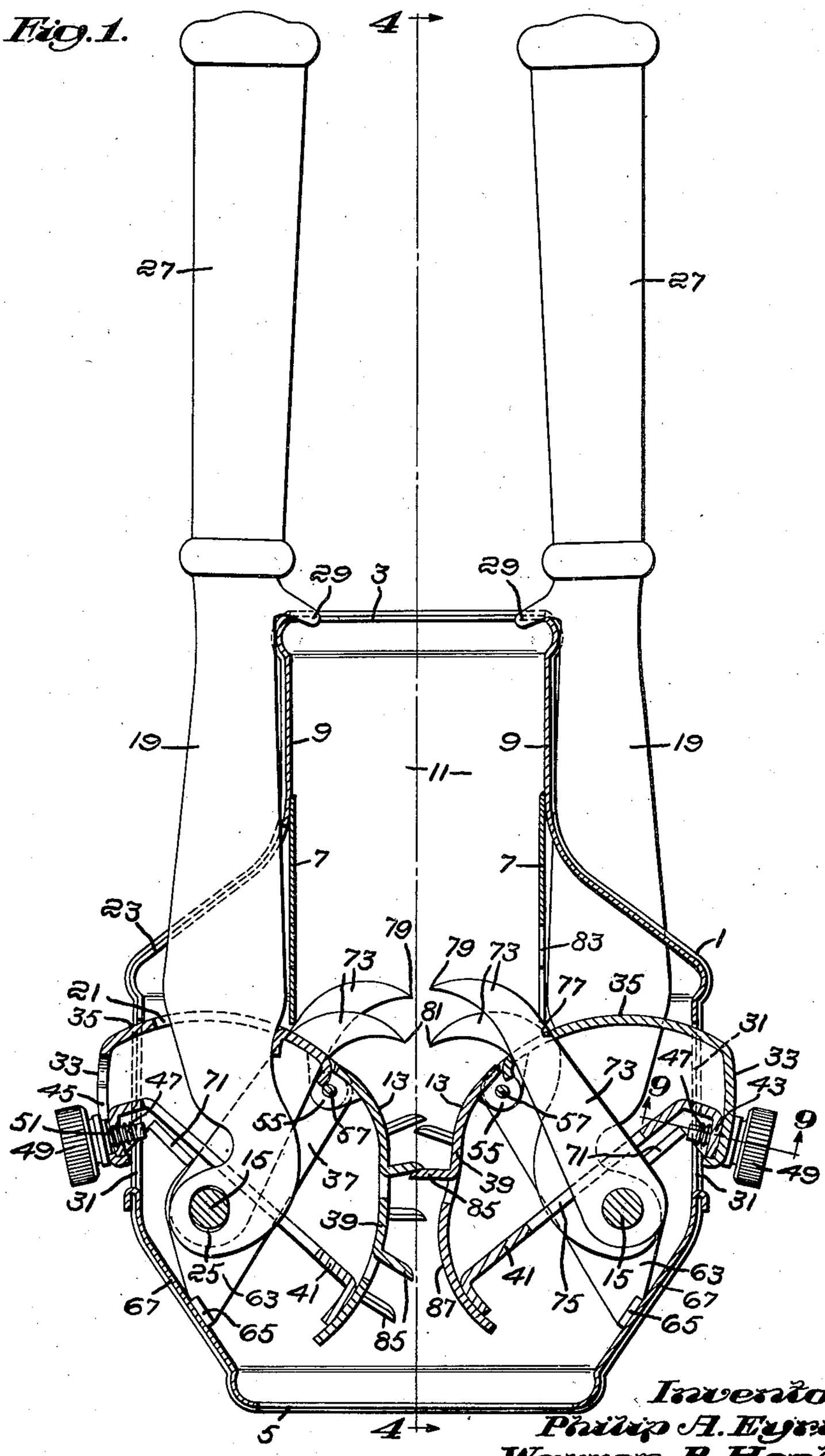

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Fig. 2.

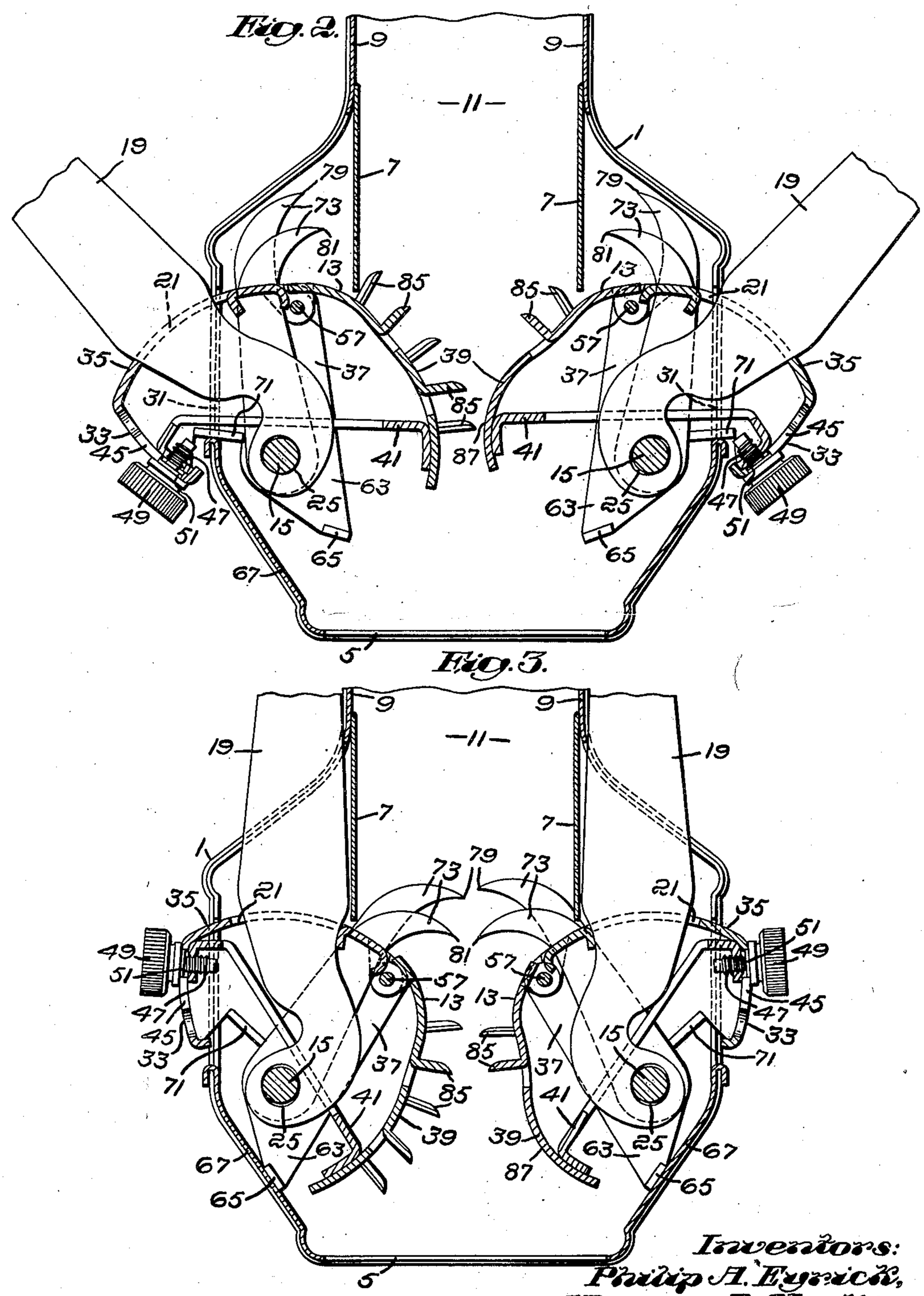

Fig. 3.

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Fig. 4.

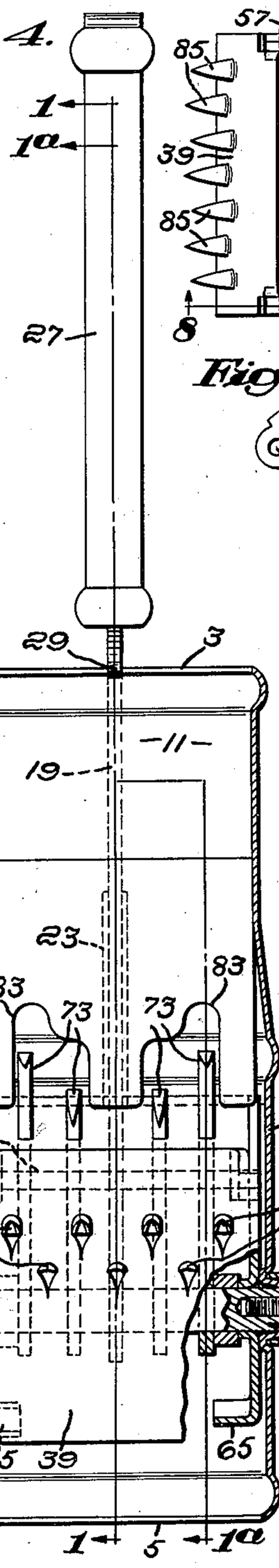


Fig. 7.

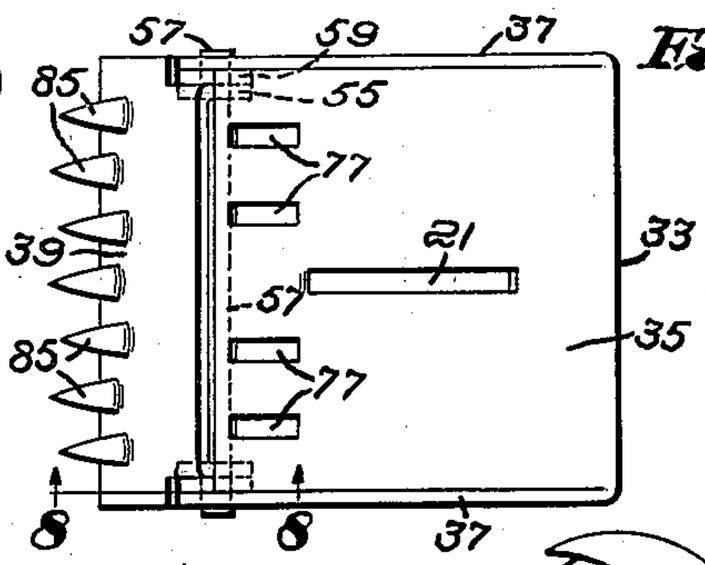


Fig. 8.

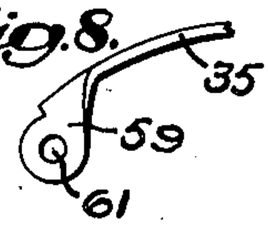


Fig. 5.

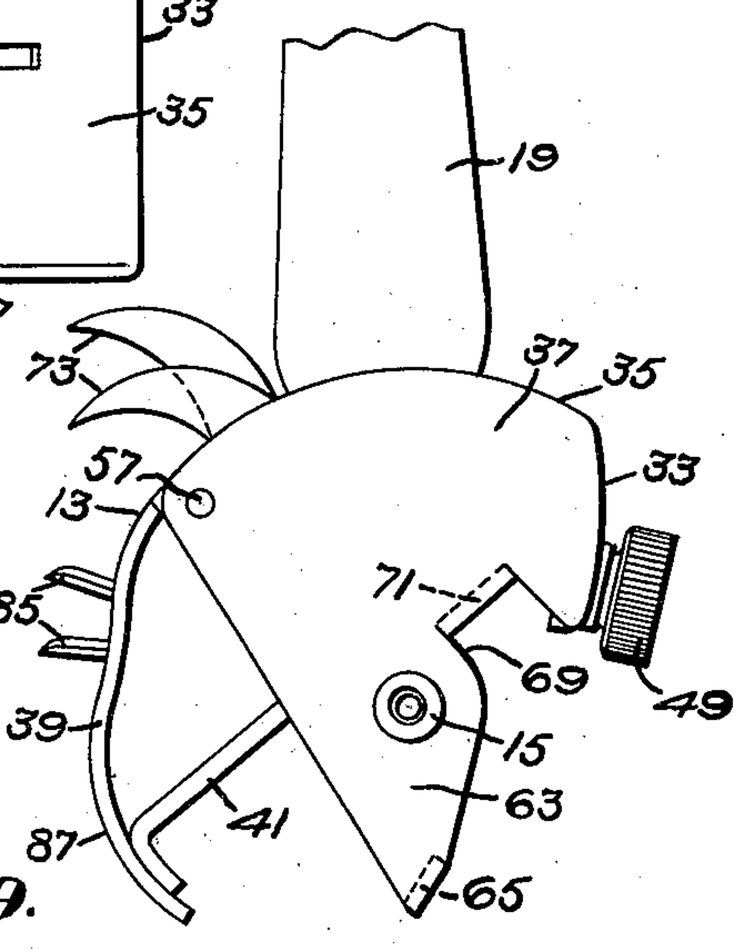
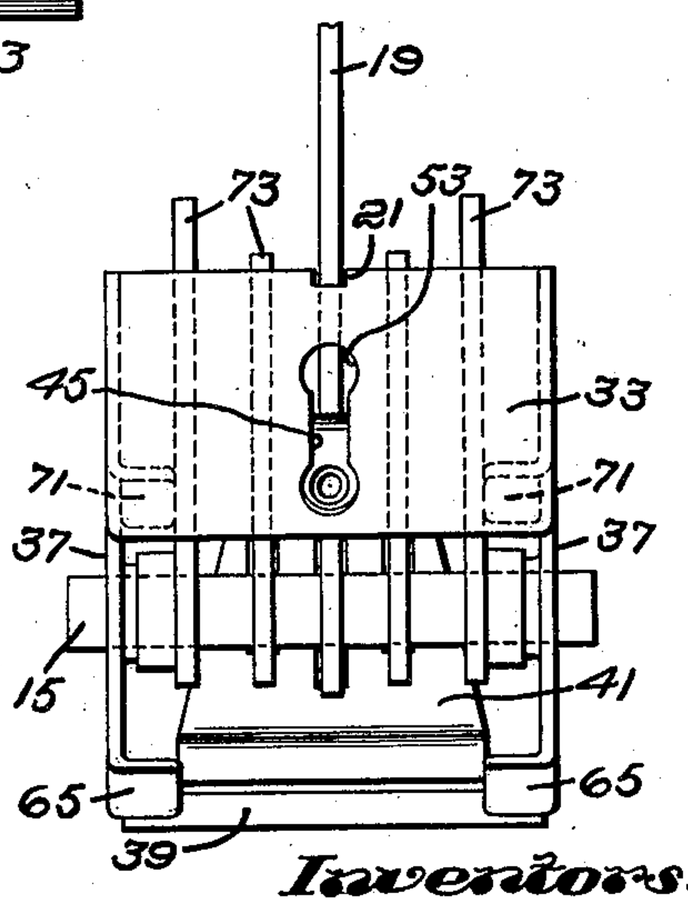


Fig. 9.

Fig. 6.



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UNITED STATES PATENT OFFICE

2,123,827

ICE CRUSHER

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Application March 7, 1936, Serial No. 67,662

16 Claims. (Cl. 83—63)

Our invention, which relates to ice crushers, will be best understood from the following description when read in the light of the accompanying drawings of an embodiment thereof, the scope of which invention will be more particularly pointed out in the appended claims.

In the drawings:—

Figure 1 is a vertical section of an ice crusher according to the invention, with parts in elevation, the parts at the left of the medial line being a section on the line 1—1 of Fig. 4, and the parts at the right thereof being a section on the line 1^a—1^a of Fig. 4;

Fig. 2 is a fragmentary view of the ice crusher according to Fig. 1, with parts in a different operative position;

Fig. 3 is a fragmentary view of the ice crusher according to Fig. 1, with the ice crushing instrumentality adjusted to produce a coarser division of the ice;

Fig. 4 is a section on the line 4—4 of Fig. 1;

Fig. 5 is a side elevation of one of the rocker members of the ice crushing instrumentality, with a fragment of one of the handle members attached;

Fig. 6 is an elevation of the rocker member according to Fig. 5, looking at the latter figure from the right, with parts omitted;

Fig. 7 is a plan of the rocker member according to Fig. 5, with parts omitted;

Fig. 8 is a detail as viewed on the line 8—8 of Fig. 7; and

Fig. 9 is a section on the line 9—9 of Fig. 1, showing a detail.

Referring to the drawings, the ice crusher comprises a casing 1 having an upper opening 3 for receiving the ice to be crushed and a lower opening 5 for discharging the ice after it is crushed.

At the interior of the casing are spaced plates 7, the upper edges of which are welded to the lower portions of the side walls 9 of the neck of the casing, these members projecting downwardly into the body of the casing to form a receptacle or hopper 11 for receiving the ice. The lower opening of the hopper 11 is partially closed by an ice crushing instrumentality comprising a pair of rocker members adapted to act upon and crush the ice which passes between the opposed surfaces 13 thereof, and to feed the crushed ice toward the lower opening 5 of the casing.

As shown, the rocker members are mounted upon shafts 15 supported at opposite ends in the opposite side walls 17 of the casing. Pivotally mounted upon these shafts 15 are handle members 19, which lie in the same vertical plane and extend through narrow slots 21 in the rocker members and narrow slots 23 in the casing to the exterior of the latter, so that the handle members may be oscillated to oscillate the rocker members. It will be observed that the slots 21 in the rocker members are of length greater than the width of the handle members so that there is lost motion between the handle members and the rocker members. This construction enables a hammer blow to be imparted by the handle members to the rocker members, which is effective readily to break up the ice.

As shown, the openings 25 at the lower ends of the handle members, through which openings the shafts 15 extend, are of oval or elliptic shape with their major diameters extending lengthwise of the shafts, so that the handle members have a lost motion connection to the shafts causing the handle members to move vertically relative to the casing when the operator grasps the grip portions 27 of the handle members and raises the device off a table or other support. This lost motion is effective in the present device for operating a readily releasable means for locking the handle members in their positions shown by Fig. 1 when the device is placed in vertical position upon a support. For this purpose the handle members are shown as formed with lateral hook-like projections 29 adapted to hook over the edge of the upper opening 3 of the casing when the device is placed upon the support. When the grip portions of the handle members are grasped by the operator and the device raised from the support the hook-like members will automatically disengage and will not reengage until the device is again placed upon the support and the handle members moved into their positions shown by Fig. 1.

As best illustrated by Fig. 1, the rocker members project at their outer sides through openings 31 in the casing. These rocker members, as shown, are hollow, each having an outer or rear wall 33, and, formed integrally with the rear wall, a top wall 35 and opposite side walls 37, the top wall and side walls being formed by bending over portions of the sheet of metal which forms the rear wall. Pivotally connected to the body portions, just described, of the rocker members are portions 39 to which are welded arms 41 the outer ends of which latter are bent to form portions 43 in adjustable sliding engagement with the inner surfaces of the rear walls 33 of the body portions. As illustrated, the rear walls 33 are provided with dumb-bell-shaped slots 45 through which extend the screw-threaded

shanks 47 of set screws 49, these shanks being screw-threaded into the portions 43 of the arms 41. By this means the portions 43 of the arms can be slid upwardly from their position shown in Figs. 1 and 2 to their position shown in Fig. 3, so as to swing the portions 39 of the rocker members relative to the body portions thereof. As shown, the set screws 49 have portions 51 adapted to enter the enlargements 53 at the upper and lower ends of the dumb-bell-shaped slots 45, so as securely to lock the portions 43 of the arms 41 in their adjusted positions. As illustrated, three positions of adjustment corresponding to three different degrees of fineness of the crushed ice are provided, namely, the positions shown by Figs. 1 and 3 and an intermediate position secured by having one of the set screws 49 at the upper end of its slot 45 and the other set screw at the lower end of its slot.

As shown, the parts 39 of the rocker members are provided with downturned ears 55 through which extend a pin 57 pivotally connecting said parts to the body portions of the members, these pins at their opposite ends being supported by the opposite side members 37 of the bodies of the rocker members. For strengthening the parts, the corners of the top members 35 of the body portions of the rocker members are bent downwardly to form ears 59 which have perforations 61 through which the pins 57 also extend.

As illustrated, the side member 37 of the body of each rocker member is provided at opposite sides thereof with a downwardly projecting portion 63, the extremity of which is bent at right angles to form a stop 65 which cooperates with the casing portion 67 when the parts are in the positions illustrated by Figs. 1 and 3. The opposite edges of each side member between the shaft 15 and rear wall 33 are notched, as indicated at 69, by slitting said side members and bending the portions between the slits at right angles, these bent portions forming stop members 71 which engage with the lower edges of the adjacent openings 31 in the casing when the parts are in the positions shown by Fig. 2. Thus the stop members 65 and 71 cooperate with the casing to limit the travel of the rocker members in opposite directions.

As shown, each rocker member is provided at its uppermost portion with a row of large teeth 73. These teeth have openings permitting them to be threaded on the shafts 15, and extend radially of the shafts through openings 75 in the bars 41 and openings 77 in the top walls 35 of the bodies of the rocker members. By this construction when the rocker members are oscillated by the handle members the teeth move with them. Four of such teeth are shown for each rocker member, and it will be observed from Figs. 1 and 4 that in the present device the outer pair of teeth of the row are shaped to have their ice engaging points 79 in a higher plane than the ice engaging points 81 of the middle pair of teeth. These teeth act to split the ice entered into the hopper 11, and it has been found that by having the ice engaging points of some of the teeth in a lower plane than the ice engaging points of other teeth clogging of the ice between the several teeth and between the latter and the casing is prevented. For example, if a cube of ice is entered into the hopper, the ice engaging points 81, when the handle members are oscillated, will break off a pair of opposite edge portions of the cube on the first closing stroke of the rocker members, while on the next closing stroke of the rocker members the ice engaging points 79 will engage opposite sides of the cube toward its center and break up the remaining portions. Were the ice engaging points all in the same plane there would be a tendency for the cube to be split into flat sheets which would tend to clog between the teeth, and between the outer teeth of the row and the adjacent walls of the casing.

As shown, the plates 7 forming the side walls of the hopper 11 are cut away, as best shown at 83 in Fig. 4, to permit passage of the teeth 73 into and out of the hopper. When the parts are in the position shown by Fig. 2, ice may be entered into the hopper to rest against the rocker members, the teeth 73 then being outside the hopper. When the parts are moved into the position shown by Fig. 1 the teeth 73 have been moved into the hopper to engage the ice.

The portions 39 of the rocker members are struck up to provide teeth 85 which are smaller than the teeth 73, and these teeth act to divide the ice as it passes between the rocker members and to feed the ice downwardly between said members so that the crushed ice will be discharged through the lower opening 5 of the casing. Although but one of the rocker members need be provided with teeth 85, it has been found that best results will be secured by providing one of the members 39 at its upper portion with several rows of teeth, as illustrated, the toothless lower portion of this member 39 being bulged, as indicated at 87, toward the other rocker member so as to provide less clearance between the rocker members adjacent that toothless portion. By having fewer teeth on one member than on the other, and preferably no teeth at at least the lower portion of one of the members, the device acts to prevent clogging of the ice between the two members. Commonly if both members 39 were provided with teeth throughout their entire extent the ice would clog between said teeth.

It will be understood that within the scope of the appended claims wide deviations may be made from the form of the invention illustrated and described without departing from the spirit of the invention.

We claim:

1. An ice crushing device comprising a casing, an ice crushing instrumentality in said casing, means comprising a handle member for supporting said device and operating said instrumentality, said handle member operatively having a lost motion connection to said casing for causing relative movement between the two in one direction when said device is lifted by said handle member and in the opposite direction when said device is placed upon a support and said handle member is released, and locking means comprising a hook-like part on said handle member for engaging a cooperating part on said casing automatically operated into releasing and engaging positions by said lost motion in opposite directions respectively.

2. An ice crusher having an ice crushing instrumentality comprising a swinging member, said member having a part movable therewith for operating upon the ice hingedly connected thereto about an axis parallel to the axis of swinging of said member, and means carried by said swinging member for adjusting said part through its hinged connection into a plurality of positions.

3. An ice crusher having, in combination, a hopper for the ice to be crushed, said hopper having a bottom opening, a pair of ice crushing

and feeding members having opposed, generally convex faces at the bottom opening of said hopper, which members are mounted for swinging about axes below and at opposite sides of said opening and at least one of which is provided with ice engaging projections, and a pair of handle members at opposite sides of said hopper mounted for independent swinging in a vertical plane for independently operating said members.

4. An ice crusher having, in combination, a hopper for the ice to be crushed, said hopper having a bottom opening, a pair of handle members pivoted for swinging in a vertical plane about axes below and at opposite sides of said bottom opening, an ice crushing and feeding instrumentality comprising members having opposed, generally convex surfaces at said bottom opening, said last mentioned members being operatively connected to said handle members respectively for swinging movement about said axes, at least one of said members of said instrumentality having a part operatively adjustably pivoted for swinging relative to the handle member which operates it about an axis parallel to and above the axis about which said handle member swings.

5. An ice crusher having an ice crushing instrumentality comprising a pair of rocker members having generally arcuate surfaces opposed to each other, which members are mounted for rocking about axes substantially parallel to said surfaces, said members having ice engaging teeth projecting from said opposed surfaces, the teeth on one of said members being confined to a smaller surface area of the generally arcuate surface thereof than are the teeth of the other member to provide a toothless portion at the lower part of one of said surfaces opposed to a toothed portion on the lower part of the other surface, the toothless lower portion of said surface being offset toward the opposed teeth on the lower part of the opposed surface.

6. A manually supported ice crusher having, in combination, an ice receiving casing, a pair of manually operated handle members for supporting said casing, an ice crushing instrumentality in said casing comprising two cooperating parts independently operated by said handle members and provided with ice engaging projections, said parts being carried for independent swinging movement relative to said casing whereby the latter and either of said handle members may swing relative to the other handle member.

7. A manually supported ice crusher having, in combination, a casing having an upper ice receiving opening and a lower ice discharging opening, an ice crushing and feeding instrumentality in said casing comprising two cooperating parts movable relative to said casing and adapted to crush between them ice entered into said casing through said ice receiving opening and to discharge it therefrom through said ice discharging opening, a pair of upwardly extending handle members carried by said casing for supporting it and for independently operating said cooperating parts of said instrumentality, said handle members being carried for independent swinging movement relative to said casing in the same vertical plane whereby said casing and either of said handle members may swing relative to the other handle member.

8. A manually supported ice crusher having, in combination, a casing, an ice crushing instrumentality in said casing, a pair of upwardly extending swinging handle members for supporting said casing and for operating said instrumentality, one at least of which handle members operatively has a vertical lost motion connection to said casing, and means operated by such lost motion for automatically locking the last mentioned handle member against movement relative to said casing when said casing is placed on a support and said member is released by the operator while in raised position and for automatically unlocking it when said handle member is moved upward by the operator to lift said casing from the support.

9. An ice crusher comprising a casing having a pivoted rocker member for operating upon the ice, a handle member operatively pivoted to said casing for operating said rocker member, said rocker member having a closed-ended slot through which said handle member extends whereby motion of said handle member in opposite directions may be imparted to said rocker member by engagement with the ends of said slot.

10. An ice crusher comprising a casing having a pivoted rocker member for operating upon the ice, a handle member operatively pivoted to said casing for operating said rocker member, said rocker member having a closed-ended slot through which said handle member extends whereby motion of said handle member may be imparted to said rocker member, said slot being of length materially greater than the dimension of said handle member lengthwise of said slot whereby hammer blow may be imparted by said handle member to said rocker member.

11. An ice crusher comprising a casing having a pivoted rocker member for operating upon the ice, which member is operatively provided with spaced abutments movable therewith, and means for operating said rocker member comprising a manually operated lever actuated part positioned between and cooperating with said abutments, the spacing of said abutments being sufficient to cause said part to have lost motion relative to said abutments whereby hammer blow may be imparted by the operator to said rocker member.

12. An ice crusher having, in combination, a casing, an ice crushing instrumentality in said casing, a handle member for supporting the device and operating said instrumentality, which handle member is mounted for swinging relative to said casing in a vertical plane and has a lost motion connection relative to said casing for causing relative movement between the two in one direction when the device is lifted by said handle member and in the opposite direction when the device is placed on a support, and means for locking said handle member against swinging movement relative to said casing comprising cooperating parts adapted to be moved into and out of engaging relation by said relative movement of said handle member and casing in opposite directions.

13. An ice crusher having, in combination, an ice crushing instrumentality comprising a pair of opposed members in spaced relation, at least one of which is mounted for swinging movement relative to the other, and at least one of which carries an ice engaging part opposed to the other member for operating upon the ice between the last mentioned member and said part, said part being mounted on that member which carries it for adjustment toward and away from the other member, and means carried by that member which carries said part for securing the latter in a plurality of selected adjusted positions relative to said member.

14. An ice crusher having, in combination, a hopper for the ice to be crushed having a bottom opening, a pair of ice crushing and feeding members having generally convex faces opposed to each other in spaced relation mounted for swinging on axes below and at opposite sides of said opening, said faces of said members being so shaped as to present substantially cylindrical surface portions of radius approximately that of the distance from the axis of swinging of each member to the adjacent edge of said opening whereby substantially to close the spaces between said faces and edges in all positions of said members, and said faces having other portions shaped to move toward and away from each other as said members are swung in opposite directions on their axes.

15. An ice crusher having, in combination, a casing, a a pair of handle members for supporting said casing by the operator, said casing including a hopper for the ice to be crushed, a pair of cooperating ice crushing parts between which the ice is received from said hopper, means operatively connecting one of said handle members to one of said ice crushing parts, and means independently operatively connecting the other of said handle members to the other of said ice crushing parts, whereby the ice may be crushed by relative movement of said handle members, each handle member and its associated ice crushing part being mounted for independent movement relative to said casing and relative to the other handle member and its associated ice crushing part, whereby when said casing is freely supported by the operator holding said handle members in separate hands respectively either or both of said handle members may be moved with its associated ice crushing part relative to said casing and the latter may move with the other handle member or relative to both handle members.

16. An ice crusher having, in combination, a casing, a pair of upwardly directed handle members for supporting said casing by the operator, which handle members are mounted on said casing for swinging in the same plane, said casing including a hopper having a bottom opening for the ice to be crushed, a pair of cooperating ice crushing parts between which the ice is received from the bottom opening of said hopper, means operatively connecting one of said handle members to one of said ice crushing parts, and means independently operatively connecting the other of said handle members to the other of said ice crushing parts, whereby the ice may be crushed by relative movement of said handle members, each handle member and its associated ice crushing part being mounted for independent movement relative to said casing and relative to the other handle member and its associated ice crushing part, whereby when said casing is freely supported by the operator holding said handle members in separate hands respectively either or both of said handle members may be swung to move with its associated ice crushing part relative to said casing and the latter may swing with the other handle member or relative to both handle members.

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