Sept. 4, 1934. T. E. FISCHER 1,972,735

ICE CHIPPER PLATE

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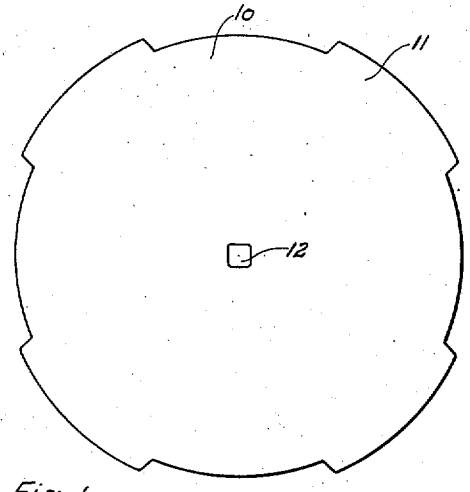


Fig. 1

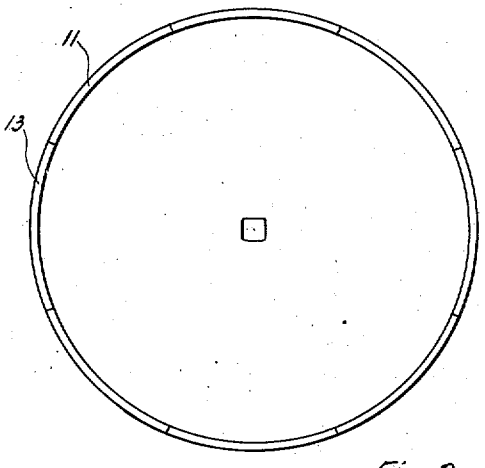


Fig. 2

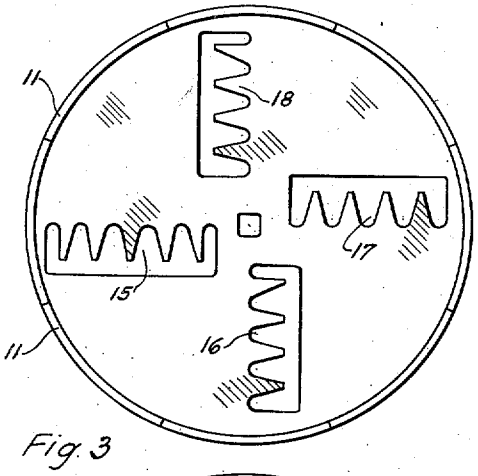


Fig. 3

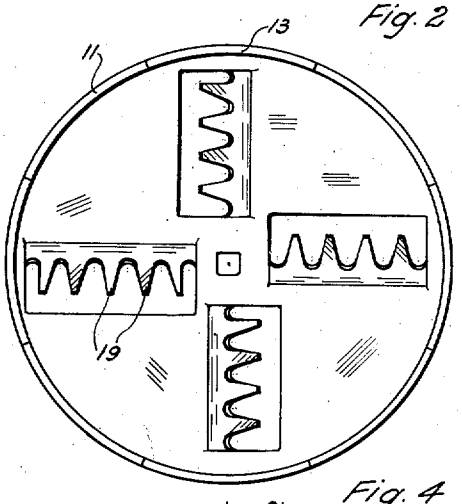


Fig. 4

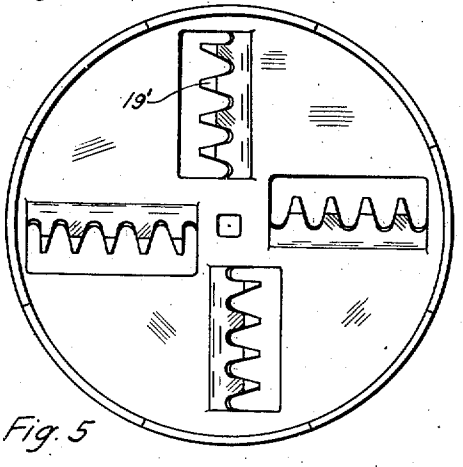


Fig. 5

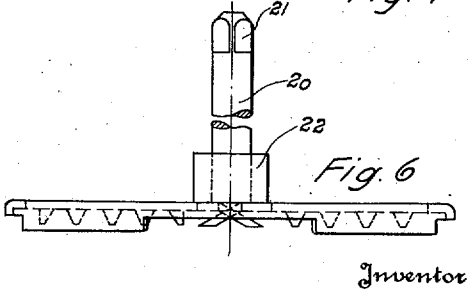


Fig. 6

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ICE CHIPPER PLATE

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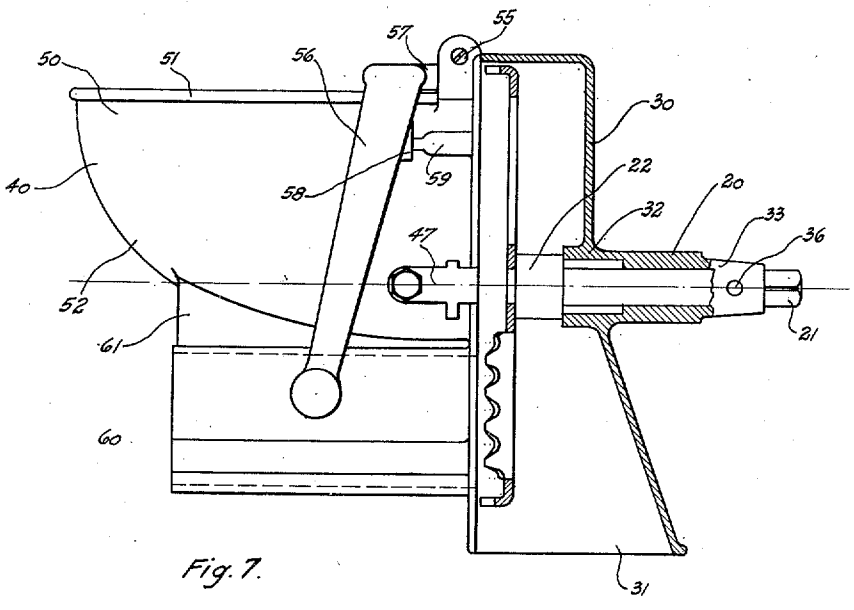


Fig. 7.

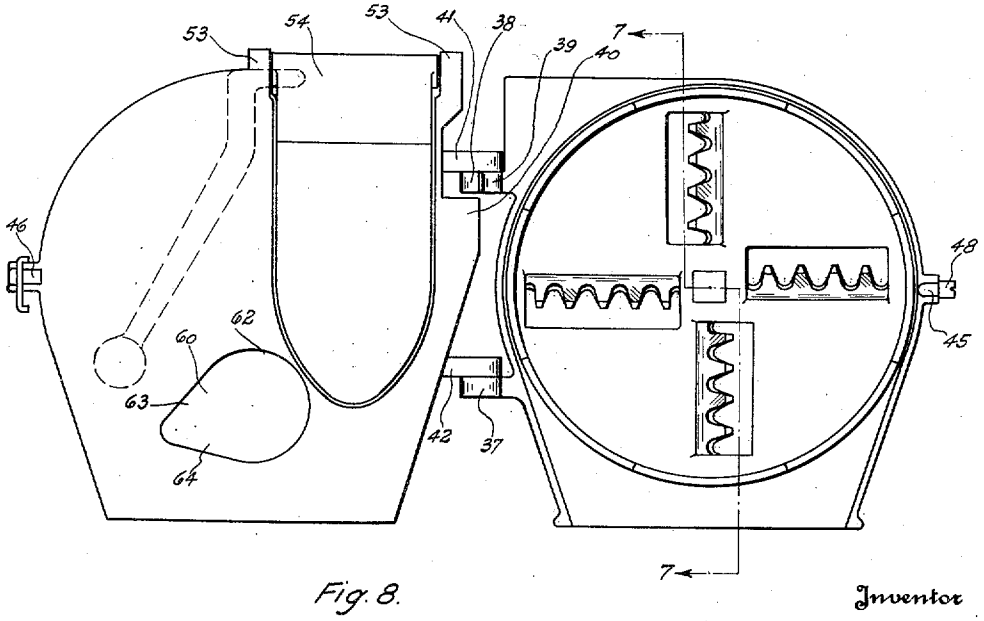


Fig. 8.

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UNITED STATES PATENT OFFICE

1,972,735

ICE CHIPPER PLATE

Theodore E. Fischer, Troy, Ohio, assignor to The Kitchen Aid Manufacturing Company, Troy, Ohio, a corporation of Ohio

Application September 8, 1931, Serial No. 561,768

4 Claims. (Cl. 83—62)

This invention relates to food handling apparatus and more particularly to a chipper plate particularly adapted to chip ice.

It is an object of the invention to provide a chipper plate suitable for chipping substances such as ice which is simple in construction, strong and rugged, easy to sharpen initially and easy to keep in a sharp condition.

It is a further object to provide a chipper plate in which the cutting teeth or knives are formed integrally with the body of the plate and in such a manner as to be easily available for resharpening.

It is a further object to provide a novel method of making such a chipper plate.

Other objects and advantages will be apparent from a study of the detailed description, the accompanying drawings, and the appended claims.

In the drawings—

Figs. 1 to 5 are plan views showing in sequence the several operations of making a chipper plate according to the present invention, Fig. 5 showing the finished plate;

Fig. 6 is a side elevational view of the finished plate with the shaft attached;

Fig. 7 is a view partially in section and partially in elevation of the chipper plate in operative position in a hopper; and

Fig. 8 is an elevational view of the hopper in opened position.

Starting with a sheet metal plate, preferably made of steel and having a thickness suitably chosen to provide sufficient strength without unduly increasing the weight of the plate, the first operation consists in stamping out a substantially circular plate 10 from the stock having formed thereon a plurality of radially extending projections 11. These projections are of equal width and are symmetrically spaced around the periphery of the plate. As illustrated in the drawings four such projections are shown but any convenient number may be chosen. At the same time that the plate is stamped out from the stock, a hole 12, substantially rectangular in outline, is likewise formed at the center of the plate.

The second operation consists in forming a peripheral flange 13 by bending over the rim of the plate at right angles to the face thereof. The flange is shallow intermediate the projections 11, which now extend at right angles to the face of the plate and project substantially above the plane of the flange.

The next operation consists in stamping out groups of cutting teeth from the face of the plate. The first group 15 is shown as having five individual teeth, although the number can be varied as desired, the first tooth being located relatively close to the center hole, the last being adjacent the peripheral flange, the whole set of teeth extending radially and being in line with the space between projections 11. The other groups of teeth 16, 17 and 18 are likewise formed, either in a single operation with the stamping out of the group 15 or in successive operations, these groups as shown each having four cutting teeth, and the teeth commencing at increasing distances from the center so that the teeth are staggered around the plate. All the groups of teeth are so formed with respect to the projections 11 that each group is aligned with the space between two adjacent projections, or in radial non-alignment with the projections themselves.

The next operation consists in pressing up the ends of the teeth 19 as shown in Fig. 4. All of the teeth are so pressed that their extremities lie in a plane which is intermediate that of the flange 13 and of the ends of the projections 11. In this way, the ends of the teeth are exposed above the level of flange 13 and so are made easily available to the action of a sharpening tool, such as a file, while at the same time they are protected by not extending above projections 11.

The next operation consists in sharpening the ends of the teeth. This is conveniently done by placing the plate in a lathe and rotating it against a cutting tool which is advanced against the outwardly projecting teeth. As shown, the cutting tool will form a beveled edge 19′ on each tooth, the face 19′ being substantially level with that of the face of the plate. This provides a sharp cutting edge at the forward part of each tooth and likewise provides a flat surface which may be easily sharpened in several ways after the device has been in use, for instance, by the use of a file. As pointed out above, the teeth extend above flange 13 and thus the sharpening process is rendered very simple. At the same time, the projections 11, standing above the teeth, protect the same against accidental impacts which would dull and bend the teeth.

A shaft 20 is fastened to the plate by means of bolting it or riveting it to the plate through the central hole, or in any other suitable manner. This forms a driving connection for the plate. A sleeve 22 is provided on the inner face

of the chipper plate and may be suitably attached to shaft 20.

While the device described above is adapted to be used with any convenient mechanism, it will be found to give very satisfactory results when used in connection with the hopper structure to be described. This hopper comprises a housing 30, substantially cylindrical in shape and provided at its lower portion with a discharge opening 31. A hub portion 32 is formed in the wall of the housing integrally therewith, and projecting from the hub is a tapered portion 33, adapted to form the support for the entire structure when it is received in an oppositely tapered member in a support. The device as illustrated is adapted to be used as an attachment of a power driven food handling machine, such as a mixing machine, the casing of which is provided in a well known manner with an attachment coupling sleeve within which the tapered portion 33 is adapted to be inserted and held in place by means of a pin mounted in the mixing machine adapted to engage a recess 36 in the tapered portion 33.

The hub 32 forms a bearing for rotatably supporting the shaft 20 of the chipper plate, the end portion 21 extending beyond the hub so as to be conveniently driven by a corresponding socket in the mixing machine. As this is an entirely conventional structure, the mixing machine with its attachment coupling is not illustrated herewith as it forms no part of the present invention, and while the present device has been described as an attachment for such a power driven machine the invention is not so limited and the shaft 20 may be driven from any suitable source of power or by means of a manually operable crank.

Projections 37 and 38 are formed integrally with the housing 30 and are provided with vertically aligned holes adapted to serve as a mounting for the removable cover and hopper portion. The upper projection 38 is formed with an outwardly extending cam surface 39 over a portion of the surface.

The cover and hopper portion comprises a casing 40 from which, as in the case of the housing 30, may be conveniently formed as a die casting, the metal used preferably being an aluminum composition to obtain lightness coupled with strength. Lugs 41 and 42 are provided at one side of the cover and pins are fitted therein adapted to seat within the holes formed in the projections 37 and 38 to pivotally mount the cover on the housing 30. A shoulder 42 is formed on the cover portion and is adapted to cooperate with the extended cam surface 39 to prevent removal of the cover from the housing until after the hopper has been swung through approximately 180° on its pivots to the open position shown in Fig. 8 when the shoulder 42 will clear the cam and permit the hopper to be lifted vertically away from the housing. Such a construction provides for ready removal of the hopper when it is desired to clean the device but it also serves as a protection to the operator since the cover can not be removed during the normal use of the device or in case the cover should become accidentally unlatched and swung through a small arc, it would still protect the operator to a certain extent from the action of the chipping plate. Projecting lug 45 is formed on the housing and is adapted to fit closely in a recess 46 in the cover. A latching arm 47 is bolted to the cover and latches over a pin 48 carried in the housing. Thus the latching arm in conjunction with the cocperating lug and recess serves to securely hold the cover in fixed position relative to the housing during the operation of the device.

A food or ice admission hopper 50 is formed in the cover, the hopper having an elongated top opening as indicated at 51 which extends across substantially the entire upper portion thereof so that foodstuffs may be readily dropped into this hopper. The bottom wall of the hopper is curved in the arc of a circle as indicated at 52. Upstanding projections 53 formed on the wall of the hopper provide a mounting for a feed plate 54 which is pivotally supported therein by means of pins 55. The feed plate is so shaped as to correspond with the internal surface of the hopper passage so that when rotated on its pivots it sweeps through the entire passage and serves to advance any material therein towards the bottom of the passage and into contact with the cutting elements. A handle 56 is provided for operating the feed plate, shown as integral therewith, and is so arranged that the food may be advanced through the trough-like passage to the treating mechanism without the necessity of touching the same with the hands or placing the hands near the cutting mechanism. In order to insure that the operator will use the feed plate the same is so constructed that it must be manually moved and held in position out of the hopper so that it tends at all times to return to the position shown wherein its face is practically flush with that of the hopper. Such action is obtained by providing a lateral extension 57 on the handle so that the weight of the same, being supported from pivots 55, normally tends to advance the plate to its extreme inner position. A lug 58 is formed upon the face of the handle and is adapted to engage a stop member 59 formed integrally with the cover to limit the downward movement of the handle to the position in which the feed plate is in its lowermost position where it is flush with the inner face of the hopper.

A second passage for the admission of material to be treated is provided as indicated at 60. This passage is substantially smaller in cross section than the hopper 50 and is located to one side of the hopper 50 and formed as a tubular extension of the cover member. A strengthening rib 61 is provided between the walls of the two passages. A portion 62 of the wall defining the lower passage is circular in cross-section while the remainder is defined by two substantially plane intersecting surfaces 63 and 64. The wall portion 63 is so inclined and intersects the wall portion 64 at such an angle that when the article to be treated is introduced into the passage and advanced against the cutting mechanism by the operator through the action of other articles in back thereof, it is urged by the rotating cutting mechanism against wall 63 and the tendency is for the article to slide against this wall into the apex of the two converging walls which in effect forms a pocket for the proper retention of the article while being treated. The dimensions of the passage 60 are so chosen that it is impossible for the hand of an adult operator to extend through the passage into contact with the cutting mechanism, but the material is advanced by placing a series of articles in the passage or if desired a manual pusher block adapted to fit within the passage may be used.

In using the hopper to chip ice, it will gen-

erally be found more satisfactory to use the hopper 50 and to raise the feed plate out of the hopper and to place the ice, either in cubes or other form, into the hopper passage. The feed plate is then advanced through the action of the handle into contact with the ice to press it forward to be acted upon by the rotating chipper plate. The spacing of the several knives of the chipper plate is such that for every revolution of the plate practically the entire section opposite the end of the hopper 50 is traversed by a cutting knife so that the ice will be uniformly chipped and so that there will be no portion which is not acted upon by a cutting knife. The flanges 11 are adapted to abut against the face of the hopper and consequently serve to space the cutting knives from the hopper a suitable distance. The thrust produced on the chipper plate is taken up by means of the collar 22 acting against the surface of hub 32.

The present device therefore provides a chipper plate which is of integral construction, inexpensive, very rugged, and simple to manufacture, being effective in use to thoroughly reduce material to small chips uniformly and without waste. After a period of use, when the cutting knives or teeth have become dulled it is a simple operation to resharpen them which operation can be easily performed by the user.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A chipping device formed of a metal plate having a bent-over peripheral flange, symmetrically arranged upstanding projections on the flange, a group of cutting teeth struck up from the plate and located in radial non-alignment with said projections, said teeth extending upwardly a distance intermediate said flange and said projections.

2. A chipping device comprising a metal plate having a peripheral flange bent over toward the operative face of the plate, symmetrically arranged upstanding projections on the flange, groups of cutting teeth formed in the plate and bent upwardly a distance intermediate said flange and said projections, said groups being aligned with the spaces between adjacent projections, and sharpened cutting edges on said teeth.

3. As an article of manufacture, a chipper plate having a peripheral strengthening flange, a plurality of spaced projections on said flange, a plurality of cutting teeth formed in said plate and positioned between said projections, the ends of said teeth extending intermediate the said flange and said projections.

4. A chipper plate of the character described comprising a circular plate having teeth extending upwardly therefrom, a strengthening flange extending in the same direction as the teeth but to a lesser degree than said teeth, and a spacing projection extending beyond said flange to protect said teeth while exposing them to the action of a suitable sharpening tool.

THEODORE E. FISCHER.

CERTIFICATE OF CORRECTION.

Patent No. 1,972,735. **September 4, 1934.**

THEODORE E. FISCHER.

It is hereby certified that the name of the assignee in the above numbered patent was erroneously written and printed as "The Kitchen Aid Manufacturing Company" whereas said name should have been written and printed as The KitchenAid Manufacturing Company, as shown by the records of the office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of October, A. D. 1934.

(Seal)

Leslie Frazer
Acting Commissioner of Patents.

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