Jan. 17, 1928. 1,656,277

G. E. HAAK ET AL

CUTTING AND SPINNING MECHANISM

Filed Jan. 27, 1926

Fig. 1.

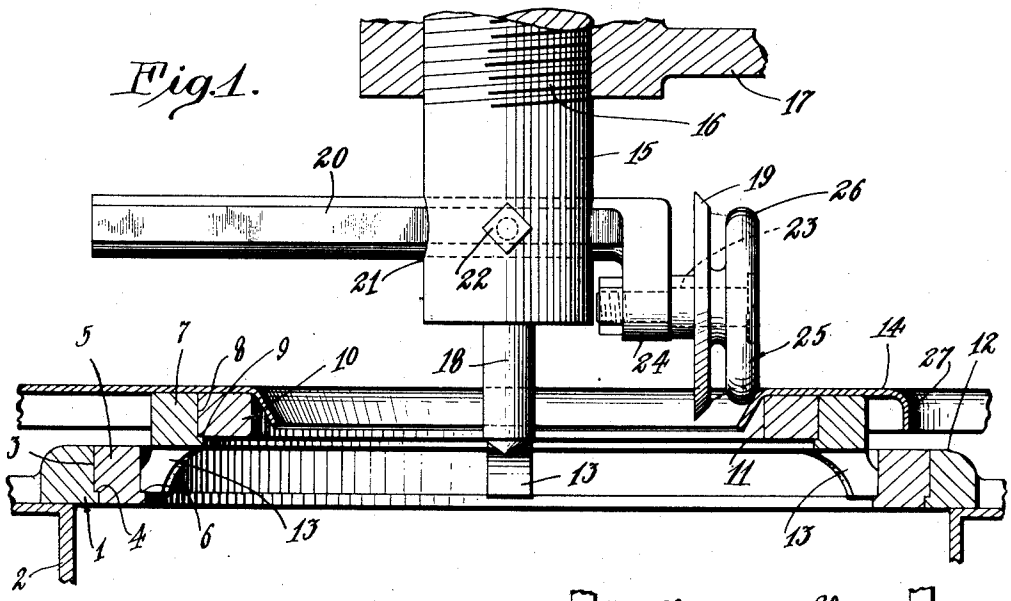
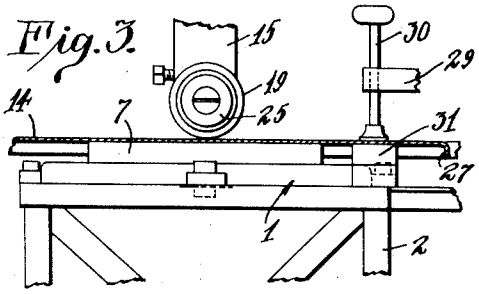


Fig. 3.



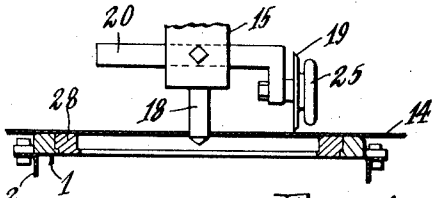


Fig. 4.

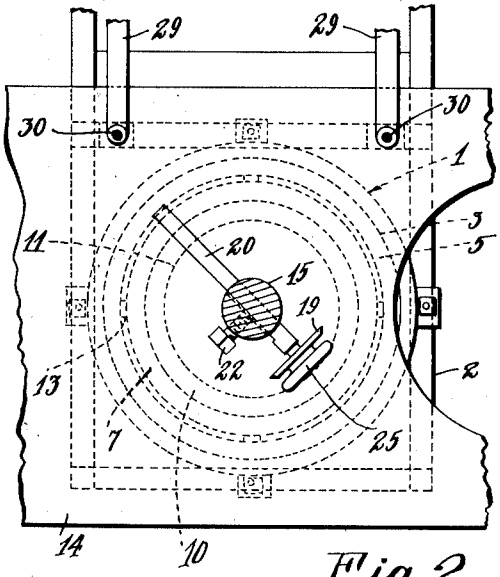
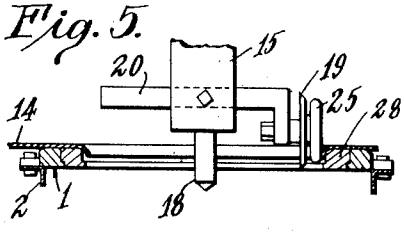


Fig. 2.

Fig. 5.



Inventors

George E. Haak

Alfred J. Kimberley

By Lyon & Lyon

Attorneys.

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UNITED STATES PATENT OFFICE.

GEORGE R. HAAK AND ALFRED J. KIMBERLEY, OF LOS ANGELES, CALIFORNIA, ASSIGNORS TO CALIFORNIA RESTAURANT EQUIPMENT COMPANY, A CORPORATION OF CALIFORNIA.

CUTTING AND SPINNING MECHANISM.

Application filed January 27, 1926. Serial No. 84,044.

This invention relates to mechanism for cutting openings in steam tables and for spinning the edges of these openings, the general purpose being to provide simple means for constructing the cover plates of steam tables which are largely used in restaurants for keeping food hot.

The general object of the invention is to provide a simple mechanism and a simple tool for effecting this operation, and which will enable openings of different sizes to be readily cut and formed with flanges; also to provide means for preventing the spun edge, or flange on the under side of the cover, from interfering with the performance of the cutting and spinning operation on another opening in close proximity to an opening already cut.

A further object of the invention is to provide a simple combined cutting and spinning tool with which a die can cooperate to effect the cutting of the opening and the spinning of its edge substantially in one operation.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combinations of parts to be described hereinafter, all of which contribute to produce an efficient cutting and spinning mechanism.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawings:

Fig. 1 is a vertical section through a spinning table and illustrating the cutting and spinning tool in operation; this view shows the steam table cover in place with the spinning operation partially completed, and also shows a portion of the spindle and parts of the spindle support broken away.

Fig. 2 is a plan upon a reduced scale showing a portion of a steam table cover in position on the spinning table and broken away; parts of the frame of the spinning table also are broken away.

Fig. 3 is a side elevation showing the upper portion of the spinning table with the lower portion of its frame broken away; this view also shows the steam table cover in position on the die ready to be cut and spun, and particularly illustrates means which we may employ for clamping the cover in position.

Fig. 4 is a view similar to Fig. 3, but shows the die of the spinning table in cross-section; this view shows the cutting tool in another position so as to illustrate the manner in which it cooperates with the die to cut an opening in the plate and spin its edge into the die.

Fig. 5 is a view similar to Fig. 4, but showing the operation at a further stage in its progress, with the spinning tool operating to spin the edge of the opening into the bore of the die.

In practicing the invention we provide a die of substantially circular form on the upper face of which the steam table cover is supported. We also provide a cutter and a spinning tool which are preferably constructed as rotary tools, and, if desired, may be formed in one piece. The cutting and spinning tool is supported for rotation about a vertical axis passing through the die; as the rotation occurs around this axis the tool descends and its first effect on the steam table cover is to cut an opening in it. As the operation progresses the cutting and spinning tools move downwardly and the spinning tool engages the cut edge of the opening and spins the same down into the bore of the die. In order to accomplish this we provide a spinning table 1 which may be supported on a suitable frame 2 at a convenient height from the floor. This table has a circular opening 3 in it with an annular shoulder 4 which may operate as a seat for a die 5. The die 5 has a shoulder 6 similar to the shoulder 4.

In cutting and spinning openings of large diameter the opening 3 in the table may operate as a die. However, in Fig. 1 we have illustrated the use of the machine when a relatively small opening is to be formed and spun in the steam table cover. In this case we provide a special die 7 having a circular opening 8 with a shoulder 9. This shoulder 9 supports the smallest die 10 which can be used in the machine. The die 10 is simply a ring with a bore 11 and constructed so that it can be supported on the shoulder 9 with its upper face flush with the upper face of the die 7.

The die 7 could of course be used as a die

to cooperate with the cutting and spinning tool, but as illustrated in Fig. 1, it is operating merely as a holder for the smaller die 10. In order to support the die 10 above the upper face 12 of the spinning table, the die 7 is provided with a plurality of short legs or lugs 13 on its under side which rest on the shoulder 6 of the spinning table.

The steam table cover 14 is in the form of an elongated plate, (see Fig. 2). In operating upon this plate, it is laid in position on the upper face of the die 10, and if desired, it may be clamped so as to hold it securely in position as the tool performs the cutting and spinning operation.

The cutting and spinning tool may be supported and rotated in any suitable manner so that it rotates on the central axis of the opening 11 of the die, and is operated so that it is fed downwardly as the rotation takes place around the axis. The drill spindle of a power drill or drill-press may be readily adapted for this purpose, but any suitable means may be provided for effecting the downward feeding movement. In the present instance we provide a spindle 15 similar to a drill spindle, but having threads 16 which pass through a threaded opening in a fixed arm 17 forming part of the machine. The lower end of this spindle has a centering tool or tip 18 and when the operation is begun this centering tip 18 is introduced into an opening previously formed at this center point.

We provide means rotated by the spindle for cutting an opening in the plate or steam table cover 14, and for turning down or spinning the edge of this opening into the cylindrical bore 11 of the die 10. For this purpose we prefer to employ a rotary cutter 19 (see Fig. 1) which is rotatably attached to an arm 20 mounted adjustably in an opening 21 at the lower end of the spindle 15. This arm 20 may be clamped in any adjusted position by a set-screw 22, and the cutter 19 is mounted for rotation on a horizontal axis which is disposed radially from the central axis of the spindle 15. For this purpose the cutter 19 is mounted to rotate on a horizontal pin 23 attached in a laterally projecting head 24 formed at one end of the arm 20.

On the side of the cutter remote from the axis of the spindle 15 we provide a spinning tool 25. This spinning tool may be mounted to rotate on the pin 23, and if desired, may be constructed as a part integral with the cutter 19.

In Figure 4 we illustrate the commencement of the cutting and spinning operation; as the spindle 15 rotates, the beveled edge of the cutter 19 cuts an opening in the cover plate 14 so that a disc of metal is severed from the plate 14; as the operation progresses the edge 26 (preferably rounded) of the spinning tool 25 engage the edge of the opening (see Fig. 1) and sweeps along the cylindrical face of the die opening, in this way spinning this edge down into the bore 11 of the die to form a cylindrical flange.

In the operation of the spinning tool and die, it will be evident that as the spinning wheel moves down into the opening of the die it is disposed as a chord across the edge of the circular opening of the die. In other words, the plane of the wheel is in the plane of a chord of the circle of the opening, and the spinning wheel at two diametrically opposite points on its edge, presses the spun edge against the face of the die.

When large openings are being formed in the steam table cover, or plate 14, the flange of an opening already formed may not interfere with the formation of other openings; in other words, the flange already formed may clear the edge of the spinning table. But in case it is desired to form an opening close to another opening which has already been formed, the forming die may be supported clear above the upper face of the spinning table as illustrated in Fig. 1. In this view the flange 27 of an opening already formed in the steam table cover is illustrated supported clear of the upper face 12 of the spinning table.

Fig. 5 shows the operation of spinning substantially completed, and in this view the spinning tool is represented as cooperating with a large sized die supported in the table so that its upper face is flush with the upper face of the table; in other words, the die 28 illustrated in Fig. 5 corresponds to the die 5 which in Fig. 1 is merely operating as a die holder.

If it is desired to employ clamping means for securing the steam table cover when being operated upon, any suitable means may be employed for this purpose. If desired, a pair of horizontal arms 29 may be provided to project out over the edge of the cover 14 (see Figs. 2 and 3) and these arms may be provided with ordinary screw clamps 30 which can be screwed down so as to clamp the cover against the top of the spinning table or against blocks 31 set in position on the upper face of the spinning table as illustrated in Fig. 3.

It will be evident that this invention enables openings to be very quickly cut and spun in steam table covers or any similar operation to be performed; and our invention enables the cutting and spinning to be performed substantially as a single operation. By providing dies of different diameters it will be evident that the same spinning table can be used to enable openings of different sizes to be readily cut and spun.

It is understood that the embodiment of the invention described herein is only one of the many embodiments this invention may take, and we do not wish to be limited in

the practice of the invention, nor in the claims, to the particular embodiment set forth.

What we claim is:—

1. In a machine for cutting openings and spinning their edges in steam table covers or the like, the combination of a die having a circular opening, for supporting the steam table cover, a rotating arm mounted to rotate about the vertical axis passing through the center of the die opening, a cutter carried on the arm for cutting a hole through the cover as the arm rotates, a spinning tool in the form of a wheel removed from the plane of the cutter, and carried by the arm further from the axis of rotation than the cutter, means for advancing the arm downwardly as the same rotates to move the spinning wheel into the die opening with the plane of the wheel disposed as a chord of the circular opening and cause its edge at two diametrically opposite points to sweep along the inner face of the die opening and cooperate with the same to spin the edge of the opening in the cover down into the die.

2. A combined cutting and spinning tool to cooperate with a circular die opening to cut openings in steam tables and spin their edges, having an arm for attachment to a rotary spindle, a cutter carried by the end of the arm, and a rotating spinning tool in the form of a wheel with a projecting edge, supported on the arm and located on the side of the cutter remote from the arm, said spinning tool constructed to pass down into the die opening in the plane of a chord of the circular opening, and having a rounded edge operating to sweep along the inner face of the circular die at two diametrically opposite points, and cooperate with the same to spin the edge of the opening in the cover against the face of the opening in the die.

3. In a machine for cutting openings in steam table covers and spinning their edges, the combination of a die having a circular opening with a cylindrical face, a cutter mounted to rotate on the axis of the die opening and operating to cut an opening in the cover, a spinning tool in the form of a wheel supported on the side of the cutter remote from the said axis, means for moving the cutter and spinning tool downwardly as the same rotate, to cut an opening in the cover, said spinning tool operating to extend as a chord in the circular opening and press the edge of the spun material at two diametrically opposite points on the wheel against the cylindrical face, and having a rounded edge.

Signed at Los Angeles, California, this 20 day of January, 1926.

GEORGE E. HAAK.
ALFRED J. KIMBERLEY.