

Dec. 1, 1936.

E. C. VOLLMER

2,062,847

SLICING MACHINE

Filed May 31, 1934

2 Sheets-Sheet 1

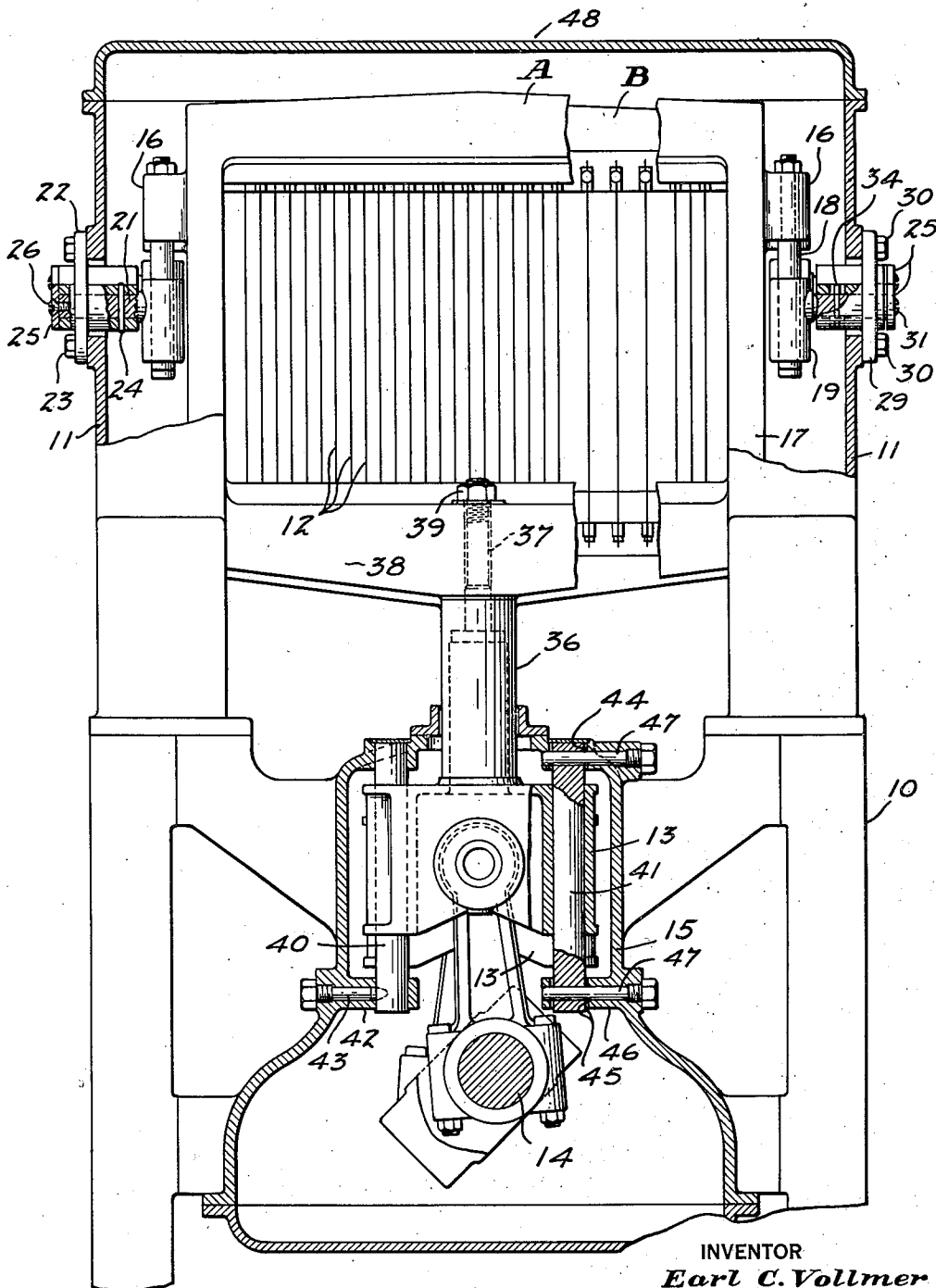


Fig. 1

INVENTOR

Earl C. Vollmer

BY

Evans & McLaughlin
ATTORNEYS

Dec. 1, 1936.

E. C. VOLLMER

2,062,847

SLICING MACHINE

Filed May 31, 1934

2 Sheets-Sheet 2

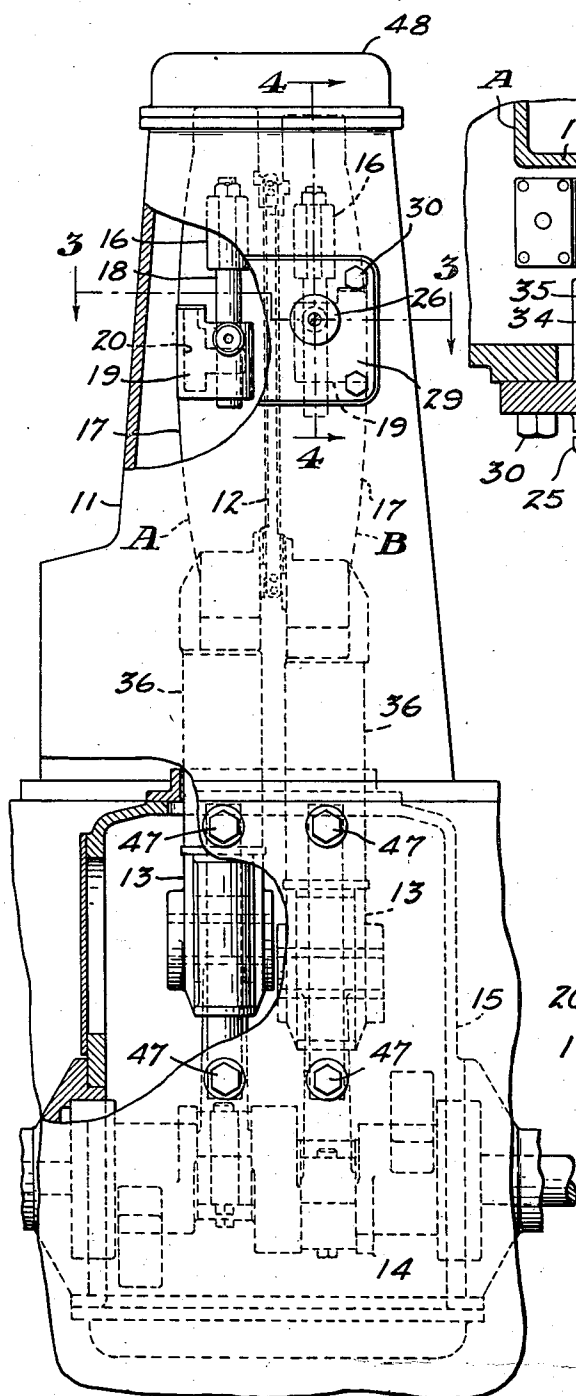


Fig. 2

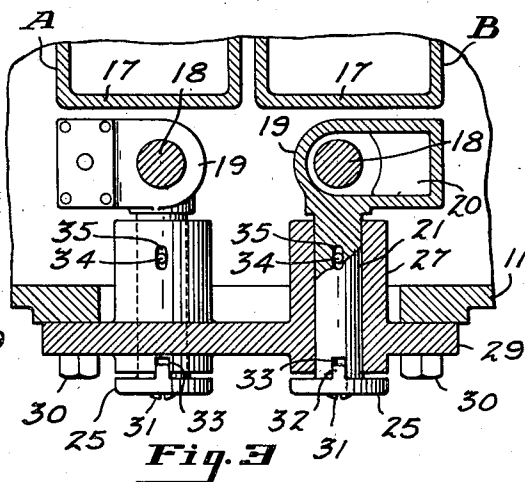


Fig. 3

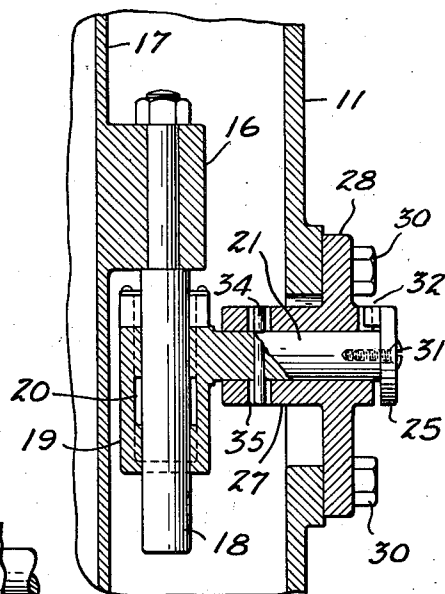


Fig. 4

INVENTOR
Earl C. Vollmer
BY *Evans & McLoe*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,062,847

SLICING MACHINE

Earl C. Vollmer, Rock Island, Ill., assignor to
Micro-Westco, Inc., Bettendorf, Iowa, a corpo-
ration of Delaware

Application May 31, 1934, Serial No. 728,353

13 Claims. (Cl. 146—153)

This invention relates to slicing machines and more particularly to slicing machines for producing a plurality of slices in a single operation.

In many types of commercial slicing machines, it is common practice to provide one or two reciprocable blade frames which carry a plurality of cutter blades, and a crank and cross head construction for reciprocating the blade frames. In order to reduce vibration it is desirable to form the blade frames and cross heads of a metal such as aluminum or aluminum alloy which is light in weight, but the one objectionable feature in doing this is that due to the generation of frictional heat within the machine and the absorption of heat from the articles being sliced, such as results between the movable and stationary parts of the machine, such parts heat up and cause binding of the movable parts with their guides.

One of the objects of the present invention is to provide a blade frame and cross head construction for slicing machines in which metal having a high coefficient of expansion as compared with cast iron may be used and which will permit expansion of the blade frame and cross head in their planes without causing binding thereof.

Another object is to provide a slicing machine blade frame which is free to expand and yet which is rigidly mounted for reciprocation.

Another object is to provide a reciprocable slicing machine blade frame with means for guiding the frame in which the guiding means is movable in the plane of the frame to permit expansion and contraction of the frame.

Another object is to provide a guided, crank operated blade frame which, although being rigidly guided, is free to expand and contract.

A further object is to provide a blade frame and cross head for driving the same which are free to expand and contract and which are guided for reciprocation in relatively close fitting bearings.

With the above and other objects in view, the present invention consists in certain features of construction and combinations of parts to be hereinafter described with reference to the accompanying drawings and then claimed.

In the drawings, which illustrate a suitable embodiment of the invention,

Figure 1 is a transverse section through a slicing machine showing the bearing means which permit expansion of the blade frames and cross heads;

Fig. 2 is a fragmentary side elevation of the slicing machine shown in Figure 1, portions of the side frame being broken away;

Fig. 3 is an enlarged section taken approximately on line 3—3 of Fig. 2; and

Fig. 4 is an enlarged section taken approximately on line 4—4 of Fig. 2.

Referring to the accompanying drawings, in

which like numerals refer to like parts throughout the several views, I have shown for the purpose of illustration a slicing machine having a lower frame structure 10 and an upper frame structure including spaced side frames 11 secured to the lower frame structure 10.

The slicing mechanism includes a pair of reciprocable blade frames A and B which may be of single piece construction as shown in the drawings, or of built-up construction. Each blade frame carries a series of cutter blades 12, one series being offset with respect to the other so that each blade of one series lies between a pair of blades of the other series and so that if desired the cutting edges of all the blades may be in alignment.

The blade frames A and B are simultaneously reciprocated in opposite directions by cross heads 13 which are reciprocated by a double throw crankshaft 14, the cross heads 13 and crankshaft 14 preferably being carried in a suitable housing 15 which is secured to the frame structure 10.

Each blade frame is provided with lugs 16 secured to or formed integral with the side pieces 17 thereof as shown in Fig. 1, which carry depending guide rods 18. These guide rods are spaced from the blade frame side pieces 17 and are parallel to the direction of reciprocation of the blade frames. Each guide rod 18 is slidably guided in a guide block 19, the rod preferably having a close sliding fit in the opening of the guide block. Each guide block is also provided with a lubricant holding chamber 20 for insuring adequate lubrication of the guide rod.

The guide blocks 19 are provided with shank portions 21 and these portions of the guide blocks at one side of the machine are supported in a bracket 22 secured by bolts 23 to the adjacent side frame 11, suitable pins 24 extending through the brackets and shank portions 21 to hold the guide blocks at that side of the machine against movement in any direction. Cover plates 25, secured by countersunk screws 26 to the shank portions 21, may also be employed to provide a neat appearance.

The shank portions 21 of the guide blocks 19 at the opposite side of the machine are slidably mounted in the hub portions 27 of a bracket or plate 29 secured by screws 30 to the adjacent side frame 11. If desired, cover plates such as the plates 25 may be secured by screws 31 to the ends of the shank portions 21, the plates being spaced from the hub portions 27 and having lugs 32 which interfit with notches 33 formed in the hub portions 27.

As before stated, the shank portions 21 are arranged to slide in a longitudinal direction within the hub portions 27 but they are held against any possible rotational movement by any suitable means, such as the pins 34 carried by the

shank portions 21 and which have a sliding fit with elongated slots 35 formed in the hub portions 27.

Obviously by arranging one of the guide blocks for each blade frame so that it may have a sliding movement at right angles to the direction of reciprocation of the blade frame, and parallel to the plane of the blade frame, the blade frame is free to expand when it absorbs heat without causing any binding of the guides in the guide blocks, thus permitting the use of close working clearances and obviating the loose fits which tend to create noise and increase wear, that have been heretofore necessary in the use of metal in the blade frames, which has a tendency to expand when subjected to heat.

Referring to Figures 1 and 2, each cross head 13 is provided with a portion 36 which slidably extends through the upper side of the housing 15 and which carries a threaded stud 37 that extends through the lower cross piece 38 of the blade frame, a nut 39 being provided to secure the blade frame to the stud 37.

Each cross head 13 is guided by a pair of guide rods 40 and 41, the guide rod 40 being mounted at its upper end in the upper side of the housing 15 and at its lower end in a lug 42 formed on the adjacent inside face of the housing 15. The guide rod 40 is anchored and rigidly held in position by a bar 43 having a portion threaded in the housing 15, the end of the bar having a portion snugly fitting in a recess formed in the guide rod.

The guide rod 41 is mounted to have a bodily movement at right angles to the direction of reciprocation of the cross head and parallel to the plane of the cross head.

In order to accomplish this, the upper end of the rod 41 extends into an enlarged opening 44 in the upper side of the housing 15 and similarly the lower end of the rod 41 extends into an opening 45 formed in a lug 46 carried by the housing 15, both openings being of greater diameter than the guide rod. The guide rod 41 is slidably supported on pins 47 having portions threaded into the housing, the lower pin extending through the lug 46.

Each cross head is mounted in the same manner and obviously like the blade frames, is free to expand without causing binding action at the guides, thus permitting the use of close working clearances and obviating objectionable sloppy and loose fits.

The space between the upper ends of the side frames 11 is unobstructed and is closed in by a removable cover plate 48, which when removed permits the blade frames A upon removal of the nuts 32, to be bodily removed from the machine, so that the blades thereof may be sharpened or so that they may be replaced by other blade frames.

It is obvious from the foregoing description that I have provided a simple yet efficient means whereby both the blade frames and cross heads may have closely fitting bearing guides and yet are free to expand when heat is generated in the blade frames without any tendency to produce binding. This construction permits the blade frames and cross heads to be rigidly secured together and to be made of the lighter metals such as aluminum and alloys thereof to reduce vibration without the necessity of providing loose guide bearings.

Another advantage is that in providing a self-adjusting means which is actuated by the rela-

ative thermal expansion and contraction between the blade frame and the supporting means of the guide elements, and between the drive cross head and the support for its guide elements, it is not so essential to machine the parts to the degree of accuracy that has been necessary heretofore, as the self-aligning feature will allow for inaccuracies in machining without causing binding.

While I have shown the vertical guide rods 18 and the guide blocks 19 carried by the blade frame and side frames respectively, it is to be understood that they may be reversed, i. e., the guide blocks may be carried by the blade frame and the guide rods carried by the side frames.

Although a single embodiment of the invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined in the following claims.

What I claim is:

1. In a slicing machine, a pair of spaced side frames, a reciprocable blade carrying frame including cross pieces and connecting side pieces, guide bars spaced from and secured to said side pieces, apertured guide brackets slidably receiving said guide bars, one of said side frames having a journal and one of said guide brackets having an extending portion slidably mounted in said journal to permit free expansion of said blade carrying frame longitudinally of said cross pieces, said extending portion having a key element engaged with said journal to constrain said portion to longitudinal movement only, and means for reciprocating said blade carrying frame.

2. In a slicing machine, a pair of spaced side frames, a reciprocable blade carrying frame including cross pieces and connecting side pieces, guide bars spaced from and secured to said side pieces, guide brackets having apertures slidably receiving said guide bars and so formed as to hold the guide bars against lateral movements therein, one of said side frames having a journal and one of said guide brackets having an extending portion slidably mounted in said journal to permit free expansion of said blade carrying frame longitudinally of said cross pieces, and means for reciprocating said blade carrying frame, the other of said brackets being rigidly secured to its supporting side frame.

3. In a slicing machine, a pair of spaced side frames, a reciprocable blade carrying frame including cross pieces and side pieces, guide bars secured to opposite sides of said blade carrying frame, apertured guide brackets slidably receiving said bars and being carried by said side frames, one of said brackets being movable toward and away from its supporting side frame to permit expansion and contraction of said blade carrying frame longitudinally of said cross pieces, and means for reciprocating said blade carrying frame, including a reciprocable cross head, means securely connecting said cross head and one of said cross pieces, a pair of guide rods for guiding said cross head and brackets for supporting said guide rods, one of said rods being movable in a direction transversely of its axis to permit expansion of said cross head.

4. In a reciprocating machine, a reciprocable cross head, a crankshaft, a connecting rod pivoted to said cross head and crank shaft, said cross head having guide openings therein parallel to its direction of reciprocation, guide rods within said guide openings, and means for supporting said guide rods, one of said guide rods being mov-

able in its supporting means in a direction at right angles to the direction of reciprocation of said cross head to permit expansion of said cross head.

5 In a slicing machine having a reciprocable blade frame, means for reciprocating said blade frame comprising a reciprocable cross head, a crankshaft, a connecting rod pivoted to said cross head and crank shaft, said cross head having guide openings therein parallel to its direction of reciprocation, guide rods within said guide openings, and means for supporting said guide rods, one of said guide rods being movable in its supporting means in a direction at right angles to the direction of reciprocation of said cross head to permit expansion of said cross head.

6. In a slicing machine having a reciprocable blade frame, means for reciprocating said blade frame comprising a reciprocable cross head, means securely connecting said cross head and blade frame, a pair of spaced guide rods parallel to the axis of reciprocation of said cross head, bearing means on said cross head embracing said guide rods, spaced supports for each of said guide rods, one of said guide rods being movable relative to its supports in a direction at right angles to said axis of reciprocation to permit expansion of said crosshead, and means for reciprocating said cross head.

7. In a slicing machine having a reciprocable blade frame, means for reciprocating said blade frame comprising a reciprocable cross head, means securely connecting said cross head and blade frame, a pair of spaced guide rods parallel to the axis of reciprocation of said cross head, bearing means on said cross head embracing said guide rods, spaced supports for each of said guide rods, the supports for one of said guide rods having rod receiving openings of greater diameter than the supported rod, whereby the rod may move with the head during expansion or contraction thereof, said rod and support having means for guiding the rod for such movement, and means for reciprocating said cross head.

8. In a slicing machine having a reciprocable blade frame, means for reciprocating said blade frame comprising a reciprocable cross head, means securely connecting said cross head and blade frame, a pair of spaced guide rods parallel to the axis of reciprocation of said cross head, bearing means on said cross head embracing said guide rods, spaced supports for each of said guide rods, the supports for one of said guide rods having rod receiving openings of greater diameter than the supported rod, whereby the rod may move with the head during expansion or contraction thereof, said last named supports having passages at right angles to said openings and said last named rod having projecting portions slidable on said passages to guide and support the rod during expansion and contraction of the cross head, and means for reciprocating said cross head.

9. In a machine of the character described a fixed frame, a frame movably mounted in the fixed frame, and guiding means interposed between the frames at each side of the movable frame, each guiding means comprising an elongated guide member, and a bearing member embracing the elongated guide member and having a sliding fit thereon, whereby the guide member is held against lateral movements in the bearing member, the guide member and bearing member at one side of the movable frame being attached,

one to the movable frame and the other to the fixed frame, and held against sidewise movements with respect to the frame to which it is attached, to constrain the movable frame to movement in a straight line, one member of the guiding means at the opposite side of the movable frame being fixed to one of the frames, and the other being slidably mounted in the other of the frames for free movement away from or toward the fixed guide members.

10. In a machine of the character described, a fixed frame, a frame movably mounted in the fixed frame, means for reciprocating the movable frame, guides for the movable frame comprising elongated parallel guide members extending along opposite sides of the movable frame, each of said guide members being fixed to one of said frames, and bearing members carried by the other of said frames, each embracing and having a sliding fit on one of said elongated guide members, whereby the guide member is held against lateral movements in the bearing member, the bearing member at one side of the movable frame being attached to and held against sidewise movements with respect to its frame and cooperating with its elongated guide member to hold the movable frame against movements lateral to its direction of reciprocation, the other of said bearing members being mounted in its supporting frame for free movements in a direction at right angles to the guide members in the plane thereof.

11. In a machine of the character described, a fixed frame, a second frame mounted for reciprocation within the fixed frame, means for reciprocating said second frame, guides for the reciprocating frame comprising guide rods extending along opposite sides of the reciprocating frame, disposed parallel to the direction of reciprocation and fixed to one of said frames, and bearing members carried by the other of said frames, in which said rods have a sliding fit, one of said bearing members being fixed to its supporting frame and the other mounted in its frame for movements sidewise of the reciprocating frame.

12. In a machine of the character described, a fixed frame, a second frame mounted for reciprocation within the fixed frame, means for reciprocating said second frame, guides for the reciprocating frame comprising guide rods extending along opposite sides of the reciprocating frame, disposed parallel to the direction of reciprocation and fixed to one of said frames, bearing members carried by the other of said frames, in which said rods have a sliding fit, means for rigidly securing one of said bearing members to its frame, and means for slidably mounting the other bearing in its frame for movements sidewise of the reciprocating frame, said mounting means including a laterally extending guide for holding the bearing to a straight line movement.

13. In a slicing machine having a reciprocable blade frame, means for reciprocating said blade frame including a reciprocable cross head, means for reciprocating said cross head, a support, bearing means between said cross head and support for guiding said cross head during reciprocation thereof, one of said bearing means being movable at right angles to the direction of reciprocation of the cross head, and means for rigidly holding said last mentioned bearing means from movement in any other direction.

EARL C. VOLLMER.