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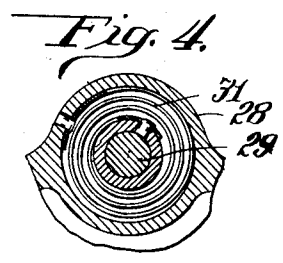
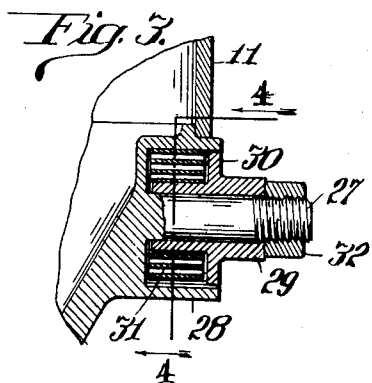
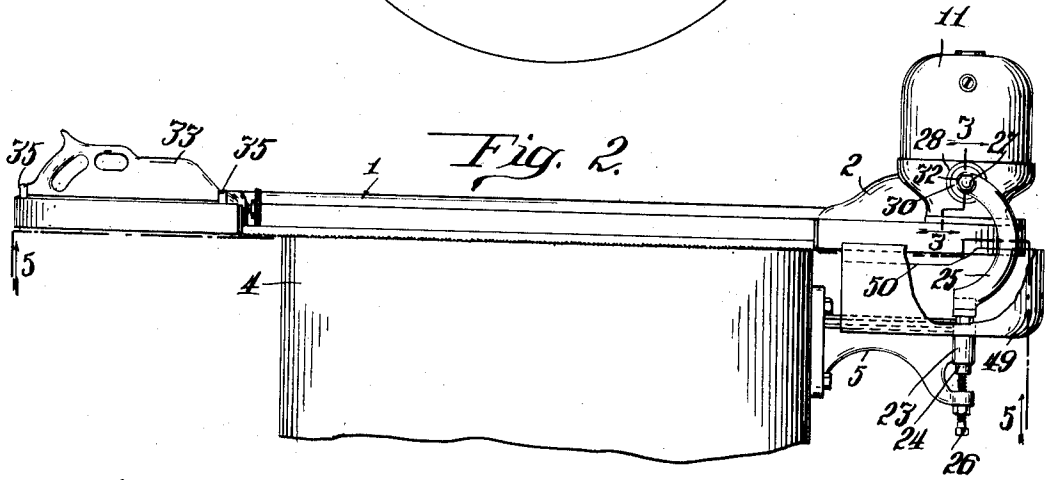
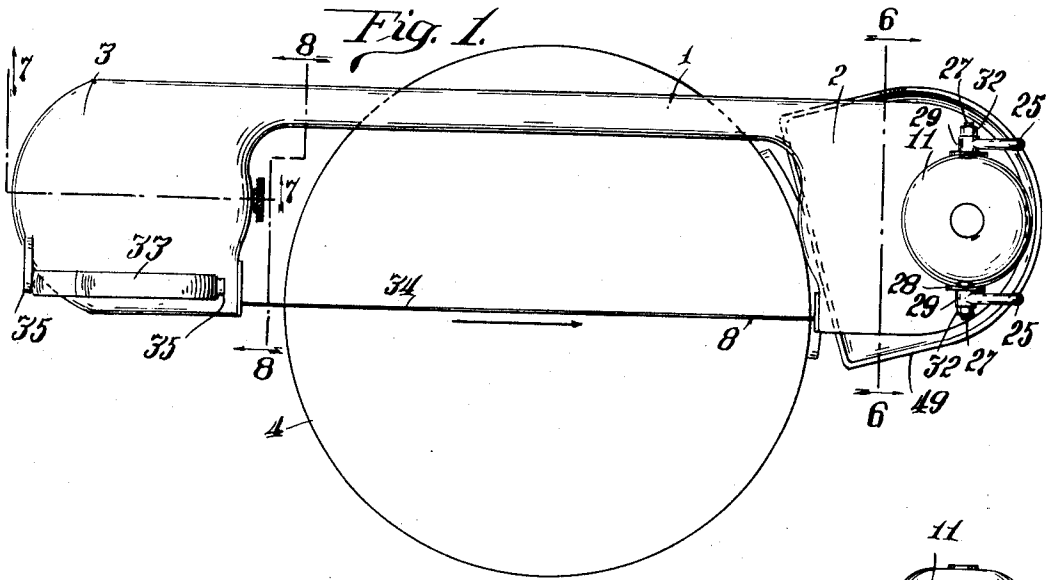
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1,938,200

BAND SAW OPERATING MECHANISM

Filed Aug. 28, 1931

2 Sheets-Sheet 1



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BAND SAW OPERATING MECHANISM

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2 Sheets-Sheet 2

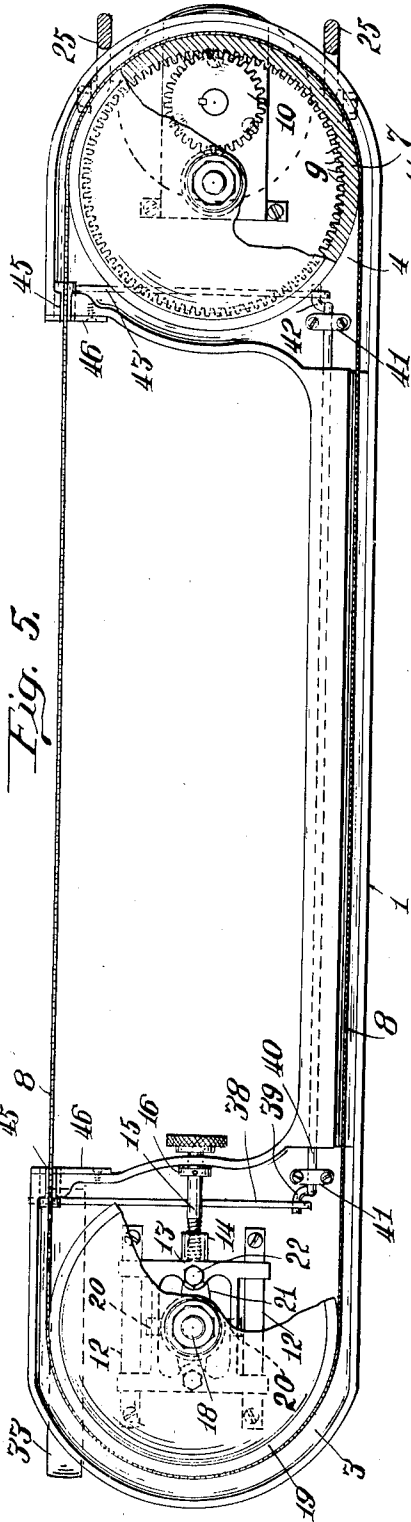


Fig. 5.

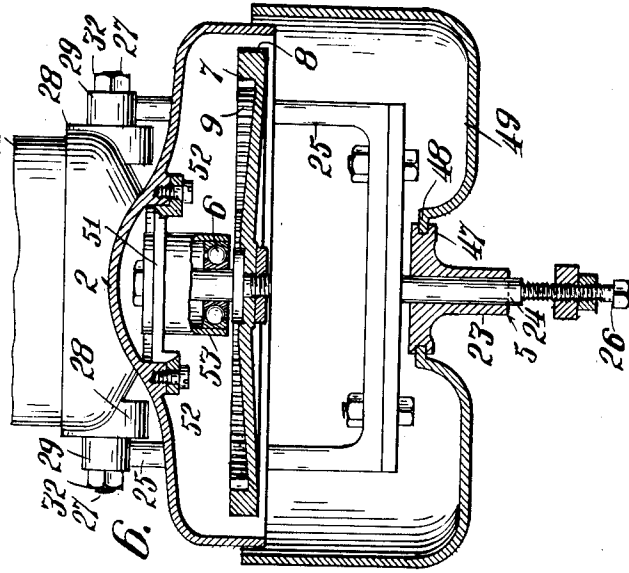


Fig. 6.

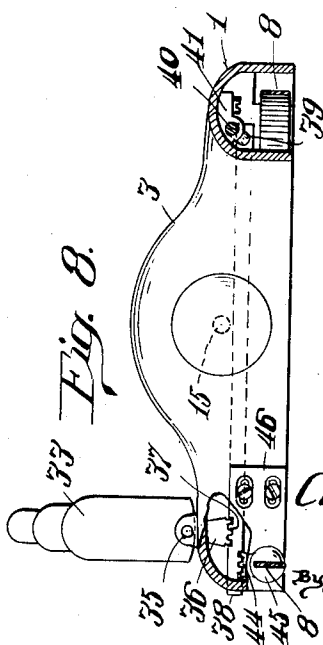


Fig. 8.

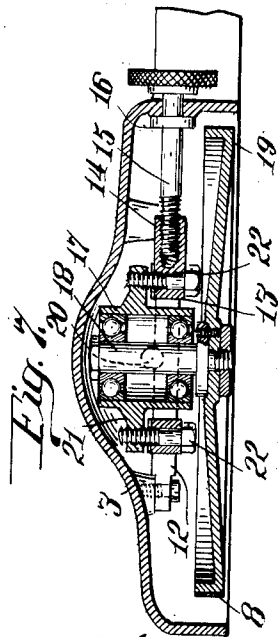


Fig. 20.

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# UNITED STATES PATENT OFFICE

1,938,200

## BAND-SAW OPERATING MECHANISM

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Application August 28, 1931. Serial No. 559,965

6 Claims. (Cl. 143—19)

This invention relates to improvements in band-saw operating mechanism of the type used in meat markets for cutting bones, the main object of the present invention being to provide a device of this character which is better adapted to the needs of the meat trade than the saws marketed heretofore, and which is also adapted for use by the wood-cutting industry.

One of the main objects of the invention is to provide a band-saw mechanism wherein the motor is more directly and efficiently associated with the saw driving elements thereof than heretofore.

A further important object of the invention is to provide means for distorting the band-saw during use thereof to enable the operator to vary the direction of the cut made by the saw.

A further object of the invention is to provide simple and efficient means for so adjusting the sheaves or pulleys over which the saw is trained as to obviate the disengagement of the saw therefrom during operation of the mechanism.

Other objects of the invention will be pointed out or understood from the following description.

In the accompanying drawings illustrating a suitable embodiment of the invention:

Fig. 1 is a plan view and Fig. 2 is a side elevation of a machine constructed in accordance with the invention.

Fig. 3 is a detail vertical sectional view on an enlarged scale on the line 3—3 of Fig. 2.

Fig. 4 is a vertical sectional view on the line 4—4 of Fig. 3.

Fig. 5 is a plan section on the line 5—5 of Fig. 2.

Figs. 6, 7, and 8 are vertical sectional views on the lines 6—6, 7—7, and 8—8, respectively, of Fig. 1.

The machine of this invention comprises the frame 1 which consists, preferably, of a unitary casting comprising a pair of substantially cylindrical end portions 2 and 3, having dished heads, and an intermediate connecting portion, indicated by the reference numeral 1, which is of inverted channel shape. The said end portions 2 and 3 are open at the bottom.

The said end portion 2 is disposed at the end of said frame which is commonly disposed adjacent to or in overhanging relation to a meat-block 4 or an equivalent thereof. In the instance illustrated, the said frame 1 is carried by a bracket 5 secured to the meat-block 4 in the manner hereinafter described.

Within the end portion 2 there is rigidly

mounted a ball bearing 6 for the stud-shaft of the pulley 7 over which the saw 8 is trained. The said pulley 7 is equipped with an internal spur-gear rim 9 which meshes with the spur-gear 10 mounted on the shaft of the motor 11 which is rigidly mounted on the head of said end portion 2 of the frame 1.

Mounted within the end portion 3 is a pair of rails 12 on which a carriage 13 is slidably mounted. This carriage is equipped with a threaded sleeve 14 in which the threaded shank of the set-screw 15 engages. The said set-screw 15 is rotatably mounted in the circumferential wall of said end portion 3 and is held against longitudinal movement relatively thereto by means of the collar 16 in an obvious manner.

The ball-bearing 17 for the stud-shaft 18 of the pulley 19 over which the saw 8 is trained, is equipped with trunnions 20 which are engaged in bearings disposed upon the carriage 13, the axis of said trunnions 20 being perpendicular to the rails 12 and to the axis of the set-screw 15. The said bearing 17 is thus a rocking element which is also provided with projections 21 in which the set-screws 22 engage, the latter being mounted in the carriage 13, as shown in Fig. 7, for effecting adjustment of the bearing 17 and pulley 19 to position necessary to prevent the saw 8 from becoming disengaged from said pulleys 19 and 7 during operation of the machine.

The bracket 5 is equipped with a bearing 23 in which the stud-shaft 24 of the yoke 25 is engaged. Said stud-shaft 24 rests upon the upper end of a set-screw 26 mounted in the bracket 5 and enables the yoke 25 to be raised or lowered.

The arms of said yoke 25 are arcuate to pass around the peripheral portion of the end portion 2 of the frame 1 and are pivotally engaged at their upper ends with the trunnions 27 of the frame of the motor 11 as shown in detail in Figs. 3 and 4. As is clearly shown in Fig. 3, the trunnion 27 projects from a sleeve or socket formation 28. The arm of the yoke 25 carries the bearing 29 which receives the trunnion 27. The bearing 29 is equipped with an annular flange between its ends which fits the sleeve or socket formation 28 and closes the mouth thereof. Clock springs 31, under given normal tension, are secured to the circumferential walls of the socket formations 28 and, at their other ends, to the bearings 29, the latter being confined upon the trunnions 27 by means of nuts 32 mounted upon the threaded outer end portions of said trunnions.

The frame 1 is thus rendered pivotally movable about the vertical axis of the stud-shaft 24 of the

yoke 25 and about the horizontal axis of the trunnions 27, the tension of the springs 31 being such as will normally maintain the frame 1 in raised position.

5 A handle 33 is pivotally mounted on the end portion 3 of the frame 1 to rock on an axis parallel with the travel of the free portion 34 of the saw 8 shown in Fig. 1. To this end the said end portion 3 is equipped with bearings 35 in which  
10 pivot pins secured to the handle 33 are engaged.

A segmental gear 36 is rigid with the handle 33 and is rotatable on the axis of the bearings 35 which is concentric with the gear teeth. The latter nest with the rack teeth 37 of the bar 38  
15 which is slidable at one end in a bearing or opening in the circumferential wall of the end portion 3 (see Fig. 7) and at its other end is pivotally engaged with the crank arm 39 at one end of a rod 40 which constitutes a rock-shaft journalled  
20 in bearings 41 in the respective end portions 2 and 3 of the frame 1, the rod or rock-shaft 40 being mainly disposed within the channeled portion of the frame 1 joining said end portions 2 and 3.

25 The end portion of said rod or rock-shaft 40, which projects into the end portion 2 of the frame, is also equipped with a crank arm 42 aligned with the crank arm 39 and this companion crank arm is pivotally engaged with a rack-bar  
30 43. The latter and the rack-bar 38 are provided on their lower edges with rack teeth which mesh with those of segmental gears 33 rigid with rocking saw-guides 45 equipped with guide recesses through which the said free portion 34 of the saw 8 engages. Said saw-guides 45 are journalled  
35 in bearings carried by adjustable plates 46 mounted upon the opposed portions of the peripheral walls of the portions 2 and 3 of the frame 1.

40 This mechanism is such that if it be desired to distort the free or cutting portion 34 of the saw 8 to divert the direction of the cut from the normal plane to one angularly disposed thereto, this being frequently desirable in meat  
45 markets and otherwise to bring the plane of the saw-cut perpendicular to the bone or other object which is angularly disposed upon the block 4 or other support.

50 In practice, the saw 8 travels at very high speed in the direction of the arrow shown in Fig. 1. The saw teeth thus carry the saw-dust into the portion 2 of the frame, the particles adhering to the teeth being dislodged by centrifugal force as the teeth pass around the pulley 7. As the  
55 teeth are disposed in a plane which is sometimes slightly below that of the lower edge of the peripheral wall of the portion 2 of the frame 1, the adhering particles are apt to be projected for some distance and thus bespatter employes or  
60 customers of the meat market.

To avoid this possibility, the bracket 5, or equivalent support, is equipped with parallel guide rails 47 to engage the inner opposed parallel flanges 48 bordering a recess in the bottom  
65 wall of a pan 49 having a U-shaped wall, the arcuate portion of the latter projecting above the plane of the lower edge of the peripheral wall of the portion 2 of the frame when the latter is horizontally disposed, which is usually the lowest  
70 position assumed by said frame. The arcuate portion of the wall of the pan is substantially semi-cylindrical and is of appreciably larger diameter than the opposed arcuate portion of the peripheral wall of the said portion 2 of the frame  
75 so as to be spaced from the latter. The par-

allel side portions 50 of the wall of the pan being cut away at their upper ends to afford ample pivotal movement of the frame 1 about the axis of the stud-shaft of the yoke to meet the requirements of users.

In use, the frame 1 is usually so disposed relatively to the meat-block 4 that the cutting portion 34 of the saw 8 extends substantially diametrically of the said block 4. The said frame is normally disposed at an incline to the surface  
85 of said block with its end portion 3 raised sufficiently not to interfere with the butcher's cutting of steaks, chops, and the like.

After the knife-cuts have been made, the piece of meat in which the same are made is adjusted  
90 to bring the first cut substantially into the plane of cut of the portion 34 of the saw 8 which is then brought down to cut through the bone in the plane of the knife-cut.

Obviously, the bone, as in the case of a hind-  
95 quarter of beef, will rarely be disposed otherwise than at some angle of inclination to the surface of the meat-block 4. Hence, as the butcher lowers the saw, he also tilts the handle 33 about its pivotal axis to distort the portion 34 of the  
100 saw 8 relatively to the balance of said saw to bring the same into the plane of the knife-cut or into the plane substantially perpendicular to the axis of the bone to be cut.

This distortion of the saw 8 is believed to be  
105 novel in the art and is highly advantageous to the user as practice has demonstrated that such distortion may extend through an angle of approximately ninety degrees without injury to the saw.

When the machine is intended for use by carpenters, cabinet makers, and other artisans, the frame 1 may be pivotally mounted to suit their needs with respect, for example, to effecting a long saw-cut in a horizontal plane, suitable  
115 mountings being easily within the skill of persons engaged in machine manufacture without special illustration or description herein.

The lower end portion of the casing of the motor 11 is rigid with the bearing for the motor  
120 shaft shown in Fig. 5. This bearing is rigid with a frame 51 which is secured by bolts 52 to the end portion 4 of the frame of the carriage.

The said frame 51 is rigid with the casing 53 of the ball bearing for the shaft of the disk  
125 or pulley which is geared to the motor shaft and over which the saw 8 is trained.

The said frame 51 may be adjusted to extend slightly angularly to the plane common to all of the teeth of the saw 8 for the same reasons as  
130 are recited with reference to the idle pulley over which the saw 8 is trained.

I claim as my invention:

1. A band-saw driving mechanism including a frame equipped with pulleys over which the band-  
135 saw is trained, a support for said frame, a motor casing rigid with said frame and equipped with trunnions, a yoke pivotally mounted on said support and with the said trunnions to cause said frame to be pivotally movable relatively to said  
140 yoke on an axis extending laterally of that on which said yoke swings relatively to said support, and springs operatively associated with said yoke and said trunnions for counter-balancing the weight of said frame.

2. A band-saw driving mechanism including a frame equipped with pulleys over which the band-  
145 saw is trained, a support for said frame, a motor casing rigid with said frame, a pair of trunnions on said motor casing, a yoke pivotally mounted  
150

on said support and engaged with said trunnions, sockets in said casing around said trunnions, springs mounted in said sockets and operatively associated with said yoke and said motor casing for counter-balancing the weight of the other end portion of the frame, a motor in said casing, and gearing between said motor and one of said pulleys.

3. A band-saw driving mechanism including a frame equipped with pulleys over which the band-saw is trained, a support for said frame, a vertical bearing on said support, a yoke journaled in said bearing, means operatively connecting said frame with said yoke to cause said frame to be pivotally movable relatively to said yoke on an axis extending laterally of that on which said yoke swings relatively to said support, pan supporting means mounted on said support and a saw-dust receiving pan disposed below the pivoted end portion of said frame and detachably engaged with said pan supporting means.

4. A band-saw driving mechanism including a frame equipped with pulleys over which the band-saw is trained, a support for said frame, a vertical bearing on said support, a yoke journaled in said bearing, means operatively connecting said frame with said yoke to cause said frame to be pivotally movable relatively to said yoke on an axis extending laterally of that on which said yoke swings relatively to said support, a pair of horizontally disposed guide flanges rigid with the said support, a substantially U-shaped saw-dust receiving pan equipped with guide rails engaged with the guide flanges of the said support for detachably securing said pan to said support, the upper edge portion of the said pan being disposed about and spaced from one end of the

first-named frame and projecting above the lower edge of the latter thereby to prevent contact of said frame with said pan during pivotal movement of said frame about the vertical axis of the said yoke.

5. A band-saw mechanism including a frame, a pair of band-saw pulleys rotatably mounted in opposite ends of the said frame, an internal gear-wheel rigid with one of said pulleys, a bearing rigid with said frame and disposed adjacent the pivotal axis of one of said pulleys, a pair of trunnions rigid with said bearing, a motor shaft journaled in said bearing and equipped with a gear pinion meshing with said internal gear, a support for said frame equipped with a vertical bearing, a yoke journaled in said bearing and having its arms engaged with said trunnions, and counter-balancing springs engaged with said yoke and said first-named bearing.

6. A band-saw mechanism including a frame, a pair of band-saw pulleys rotatably mounted in opposite ends of the said frame, an internal gear-wheel rigid with one of said pulleys, a bearing rigid with said frame and disposed adjacent the pivotal axis of one of said pulleys, a pair of trunnions rigid with said bearing, a motor shaft journaled in said bearing and equipped with a gear pinion meshing with said internal gear, a support for said frame equipped with a vertical bearing, a yoke journaled in said bearing and having its arms engaged with said trunnions, sockets around said trunnions, and counter-balancing springs engaged with said yoke and said first-named bearing, said springs being mounted in said sockets.

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