

June 25, 1935.

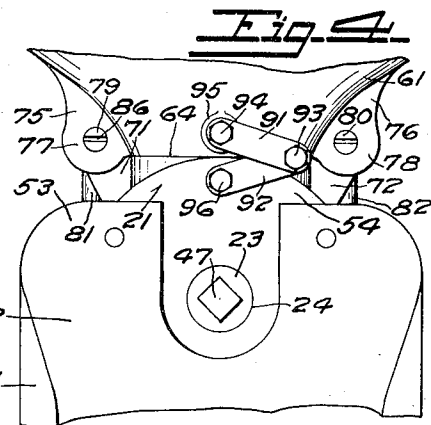
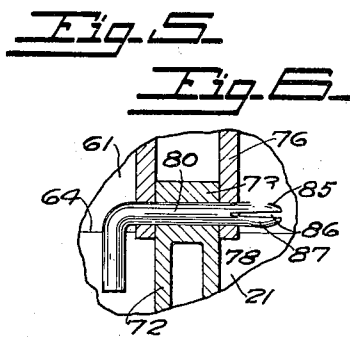
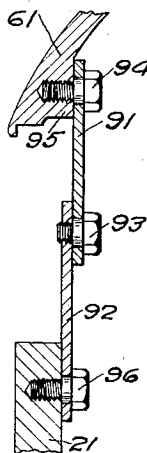
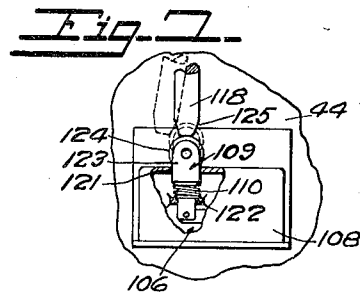
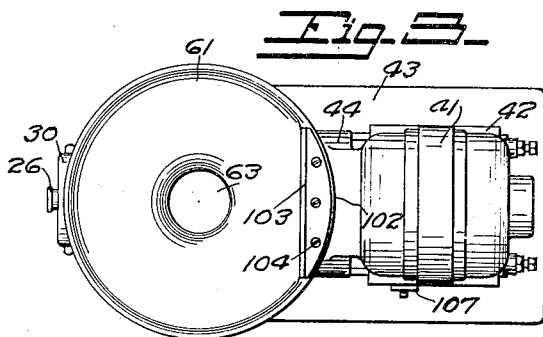
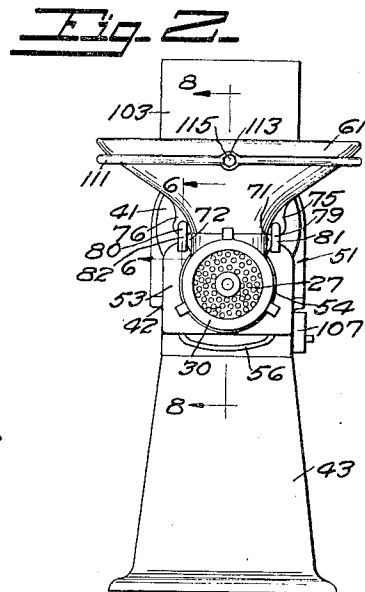
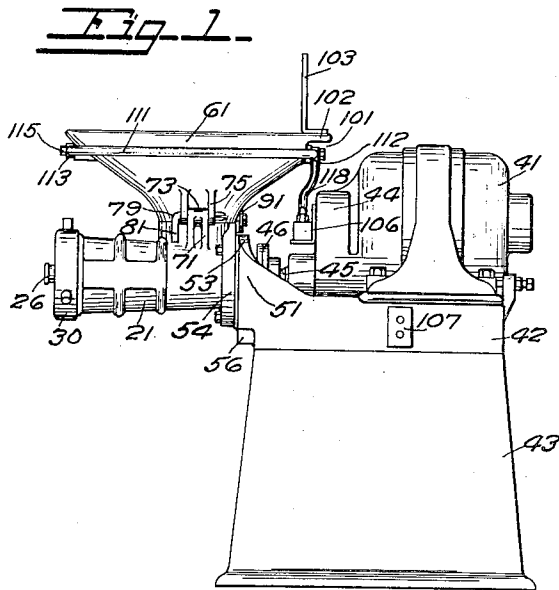
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2,006,318

MEAT GRINDING MACHINERY

Filed Oct. 7, 1933

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

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UNITED STATES PATENT OFFICE

2,006,318

MEAT GRINDING MACHINERY

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5 Claims. (Cl. 146—182)

It has been the practice to build meat grinding machinery employing a hopper, especially such machinery employing a feed-screw fed from the hopper, in increasingly larger units for greater capacity, and great difficulty has been encountered in cleaning such machinery, it being understood that such machinery is employed in grinding a perishable product, and that frequent and effective and careful cleanings are necessary to maintain the same in sanitary condition.

The material operated on by the machine is fed to the hopper, as by being pitched or dumped into the hopper and is in practice pushed toward the feed-screw by the operator using a stick or paddle for the purpose, because if the operator attempted to use his hands for pushing the material toward the feed-screw, there would be danger of mutilating his fingers or hand and of having his hand drawn into the feed-screw. It is desirable also that the operator does not physically touch the meat.

Furthermore, the top of the hopper is located quite off the floor, being usually almost shoulder high to the operator, so that the operator cannot under ordinary conditions reach into the hopper with his hands to any great extent or reach to the bottom of the hopper or to the feed-screw for cleaning purposes.

Cleaning the hopper and the feed-screw has therefore heretofore been a difficult problem, it being necessary heretofore to dismantle the machine by taking out the feed-screw and reaching as far as possible toward the bottom of the hopper through the barrel of the grinding machine in attempts to clean the inner portion of the barrel and lower portion of the hopper. Such attempts to clean have heretofore been expensive and difficult and ineffectual.

It is the object of my invention to avoid such difficulties, and to provide means whereby all parts of the hopper and meat passage of the machine are readily accessible for cleaning purposes and for rendering the same sanitary and inspection proof.

It is the object of my invention, further, to provide novel means for preventing overflow of meat beyond the hopper in feeding the hopper; and, further, to provide novel means in association with the hopper for controlling the power for operating the machine.

My invention consists in novel means for mounting the hopper of a machine of this character; further, in novel means for securing the hopper in place; further, in a novel joint between the bottom of the hopper and the mouth of the bar-

rel for the feed-screw; further, in a novel top for the hopper for controlling the meat charged thereinto; further, in novel power-control means in association with the hopper; and, further, in novel means for disposing of the drip from the bearing of the feed shaft.

The invention will be further readily understood from the following description and claims, and from the drawings, in which latter:

Fig. 1 is a side elevation of my improved device.

Fig. 2 is an end elevation of the same.

Fig. 3 is a plan view of my improved device.

Fig. 4 is an end elevation showing the hinging and limiting means for the hopper, partly broken away.

Fig. 5 is a sectional detail view of the limiting means, taken on the line 5—5 of Fig. 9, and partly broken away.

Fig. 6 is a sectional detail view of one of the hinging means for the hopper, taken on the line 6—6 of Fig. 2, partly broken away.

Fig. 7 is a detail view of the control means, partly broken away, showing the control parts in position for actuation of the machine in full lines, and for stoppage of the machine in dotted lines.

Fig. 8 is an axial section of my improved device, taken on the line 8—8 of Fig. 2, and partly broken away; and,

Fig. 9 is a vertical section of my improved device, taken on the irregular line 9—9 of Fig. 8, and partly broken away, showing the hopper in tilted position at one side of the barrel in full lines, and in tilted position at the other side of the barrel in dotted lines.

The meat grinding machine exemplified comprises a frame 21, shown in the form of a barrel in which a feed-screw 22 rotates. The feed-screw has a journal 23 rotating in a bearing 24, in the inner end wall of the barrel, and at its outer end has a journal 25 journaled in a bearing 26 in a perforated plate 27, releasably secured to the outer end of the barrel, as by being received in an internal annular rabbet 28 in the outer end of the barrel and clamped between a shoulder 29 formed by the inner wall of the rabbet and a clamp collar 30 threaded to the outer end of the barrel. The perforated plate is prevented from turning by a pin 31.

The journal 25 may be on a journal stem 32, made separate from the feed-screw and screwed in axial position thereto, as shown by the threaded connection 33.

A knife structure 36 has a hub 37 received about

a flange 38 of the journal stem 32, and is held thereto so as to rotate therewith. The knife structure has suitable wings having knife blades secured thereto, which rotate across the front face of the perforated plate so as to cut the meat being exuded through the perforations. Various perforated plates may be substituted for each other for cuttings of different finenesses.

The feed-screw is suitably rotated, as by means of an electric motor 41, mounted on a base 42, secured to a pedestal 43. The rotor of the motor has drive connection with suitable gearing in a speed reducing gear box 44 for driving a drive-shaft 45 at desired speed, the drive-shaft being journaled in suitable bearings in the gear box.

There is a suitable coupling 46 between the drive-shaft and the feed-screw, the feed-screw being releasable by endwise movement of the feed-screw from the coupling, as by providing the feed-screw with a square end stub 47, received in a square hole 48, in the coupling 46. The coupling also has key connection 49 with the drive-shaft 45.

A bracket 51 extends from the base and comprises separated bracket arms having a space 52 therebetween, the bracket having laterally extending flanges 53, to which an end flange 54 at the forward end of the barrel 21 is bolted, for supporting the barrel and the parts mounted thereon.

The base is provided with a trough 55 under the rear end of the barrel and coupling for receiving any dripping there may be through the inner bearing. The trough slants downwardly and outwardly and is provided with a spout 56 which overhangs the upper end of the column. A suitable container or pipe may receive the drippings from the spout.

A hopper 61 is provided for the barrel 21, and is arranged to receive meat which is to be ground. The barrel is provided with a mouth 62. The hopper is provided with an exit opening 63, whose position registers with that of the mouth. There is a joint 64 between the lower end of the hopper and the wall of the mouth.

The inner face 65 of the wall of the opening at the lower end of the hopper extends inwardly with relation to the inner face 66 of the mouth throughout the circumference of the mouth, so as to provide an overhanging offset shoulder 67 between the hopper and the barrel, in order that the meat and the juices thereof being fed through the hopper into the mouth may flow in inwardly offset relation through the mouth of the barrel in order to provide ready flow past the faces of the joint between the hopper and said mouth and deflect the meat and its juices from said joint. This offset shoulder may be provided with a flange 68 received inside the wall of the mouth.

The hopper is movable with relation to the mouth of the barrel, and is preferably rockable on pivot means adjacent to the mouth, so as to permit the hopper to be oscillated away from the mouth, and to expose the mouth of the barrel as well as the lower end of the hopper and the screw in the barrel, for convenient reach of the parts by the operator, as for attention and cleaning purposes.

It will be understood that in practice the upper end of the hopper in a machine of this character is approximately shoulder high to the operator, and that the hopper in machines as heretofore constructed is a fixed part of the frame of the machine. The frame and hopper are in practice heavy coatings of iron. It is ex-

tremely difficult or impossible for the operator to reach the lower portion of the inside of the hopper or the mouth of the barrel or the inner end of the feed-screw in the barrel, in machines of this character as heretofore constructed.

I therefore provide novel means for separating the lower end of the hopper from the barrel for exposing the inner portion of the hopper, the mouth and the inner end of the feed-screw, making these parts readily accessible to the operator and permitting ready attention to and cleaning of the same.

I have exemplified the hopper as pivotally mounted at both its sides, so that the hopper may be rocked toward either side of the barrel, and the lower end of the hopper, the mouth and the feed-screw exposed from either side of the machine, and alternately from both sides of the machine.

The barrel is at its respective sides provided with pivot brackets 71, 72, having pivot bearings 73, 74 thereon. The respective sides of the lower end of the hopper are provided with pivot brackets 75, 76, having pivot bearings 77, 78 thereon. The pivot bearings on either the barrel or the hopper are axially spaced apart so as to receive the pivot bearings of the other of said parts therebetween.

Pivot pins 79, 80 are received through the pivot bearings at the respective sides of the frame or barrel and the hopper. These pivot pins are preferably releasable, and are respectively provided with handles 81, 82, by means of which they may be readily pulled out of their pivot bearings sufficiently to release the hopper and reinserted into the same.

The inserted end of each of the pivot pins is tapered, as shown at 85, and said end is provided with a slot 86 for forming tongues 87 at the respective sides thereof. These tongues are slightly spread for normally separating the tongues in order to frictionally hold the pivot pins in their bearings after the same have been inserted. The tapered ends of the pivot pins permit their ready insertion axially into their bearings, and the normal spreading of the tongues frictionally holds the pivot pins in their bearings.

The respective pivot pins are located above and to the side of the joint 64 between the lower end of the hopper and the mouth of the barrel, so that when the hopper is rocked into open position at either side of the barrel, the joint face on the lower end of the hopper moves away from the joint face on the mouth, so as to expose both the joint faces throughout their areas for cleaning purposes.

Rocking movement of the hopper is limited so as to prevent undue opening movement of the hopper, as well as accidental return of the hopper. These limiting means are exemplified as toggle links 91, 92, which are pivoted together by a pivot pin 93, shown as a shoulder bolt threaded into the end of one of the links. The respective ends of the combined links are pivoted by a shoulder bolt 94 to a lug 95 on the hopper and by a shoulder bolt 96 to the barrel. The lower link 92 is shown at the inside of the upper link 91 under the lug 95. The parts are arranged to permit ready folding of the links, regardless of the direction in which the hopper may have been opened.

The pivot bolts 94 and 96 are preferably located in the vertical plane in which the axis of the feed-screw is located when the hopper is in operative position to permit extreme tilting movement of the hopper in both directions.

When the links are in extended relation, with the hopper rocked to either side of the feed-screw, the links support the hopper, so that the greater portion of its weight is at the outside of the pivot on which the hopper is rocked, in order that it may be supported safely in such over-balanced position, and thereby require effort to move the hopper toward normal position.

In such open relation, the pivots of the links are also in a straight line for placing said links on dead center, which resists closing movement of the hopper. The mounting of the links permits the links to be readily collapsed when the operator begins tilting the hopper toward closing position.

The upper end of the hopper is provided with an indentation 101 for forming a shelf 102. An upwardly extending shield 103 is fixed to the shelf, as by screws 104, and forms an obstructing wall for arresting the meat which may be pitched or dumped into the hopper, and preventing any of the same being thrown or pitched beyond the hopper or upon the motor frame. This shield is movable with the hopper.

When the hopper is in down position, both of the pivot pins are inserted in their pivot bearings for rigidly securing the hopper in place and clamping the joint face of the hopper upon the joint face of the mouth to prevent leakage at the joint.

An electric translating device, for instance, a switch 106, controls the operation of the motor. This switch is a normally open switch and is provided for safety control. A usual starting and stopping switch 107 is also provided. The safety switch may be a usual normally open switch in a box 108 shown fixed to the gear box 44. A control part 109 extends out of the box, being pressed outwardly by a spring 110 for opening the switch and stopping the motor. The control part must be continuously pressed inwardly for motor operation. Safety means are provided cooperating with the switch for controlling the switch and stopping the motor when raising the hopper and throughout raised relation of the hopper. Operating means are also provided for opening this switch while the hopper is in normal position.

An operating part 111 is provided adjacent to the upper margin or rim of the hopper. The operating part is exemplified as a bar or ring which is received about the edge of the hopper, and is movable by contact therewith by the operator. The ring has bearings 112, 113, in which pivot bolts 114, 115 are located and threaded into bosses 116, 117 on the respective sides of the hopper.

An arm 118 extends from the ring. It is shown extending downwardly from the bearing 112. The lower end of this arm bears upon the control part 109 for holding the control part or button depressed and the switch 106 closed so long as the parts are in normal positions. (Fig. 7). If the safety device has been operated, the control part is in raised position and in obstructing relation with the lower end of the arm, so that the control part must be first manually depressed before the arm can again be placed above the control part and the safety device restored to normal position.

If the hopper be raised to either side, the arm is also raised for opening the safety switch 106, so that the motor cannot be operated during raised relation of the hopper. Safety in operation and during cleaning of and attention to the parts is thereby assured.

The control part exemplified includes a stem

which is slidable in bearings 121, 122 in the control box 103 (Figs. 7 and 8), and has a fork 123 in which a roller 124 is journaled.

The engaging faces between the arm and the control part are preferably so arranged that the switch may be closed by operation of the arm or the ring 111. Thus the lower end of the arm 118 is beveled as at 125 at both sides so that the arm, while normally obstructed by the roller, may readily cause movement of the control part 109 by causing its tapered end to climb the round periphery of the roller 124, when the ring is reset into normal position. The arm has a flat end to aid in holding the arm and ring 111 in normal positions.

My improved device provides ready means for convenient access to parts of a grinding machine of the character mentioned, which were heretofore substantially inaccessible or extremely difficult to reach, and provides ready means whereby the lower end of the hopper, the mouth of the barrel and the inner end of the feed-screw may be readily reached for attention and cleaning, and enhances the sanitary efficiency of a machine of this character.

My invention further provides convenient and substantial means for accomplishing the purposes for which it is designed, and for operating and positioning the parts in such manner that accident is avoided.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a meat grinding machine, the combination of a barrel having a feed mouth, a feed-screw in said barrel, an upwardly extending hopper having a feed opening in its lower end registering with said feed mouth, pivot means between the respective sides of said barrel and the respective sides of said hopper respectively provided with releasable pivot pins for respectively disconnecting and connecting said respective pivot means for rocking movements of said hopper toward the respective sides of said barrel, and connected links having hinge connections with said barrel and said hopper for limiting opening movements of said hopper in both directions and supporting said hopper in raised relations at both sides of said barrel, said hinge connections with said barrel and said hopper respectively being in a vertical plane substantially coincident with the vertical plane in which the axis of rotation of said feed-screw is located when said hopper is in down position.

2. In a meat grinding machine, the combination of a barrel having a feed mouth, a feed-screw in said barrel, an upwardly extending hopper having a feed opening in its lower end registering with said feed mouth, pivot means between the respective sides of said barrel and the respective sides of said hopper respectively provided with releasable pivot pins respectively having handles thereon for axial movements in both directions of said respective pivot pins for respectively disconnecting and connecting said respective pivot means for pivotal movements of said hopper toward the respective sides of said barrel, and connected links having hinge connections with said barrel and said hopper for limiting opening movements of said hopper in both directions and supporting said hopper in raised relations at both sides of said barrel, said hinge connections with said barrel and said hopper respectively being in a vertical plane substantially coincident with the vertical plane in which the axis of rotation of

said feed-screw is located when said hopper is in down position.

3. In a meat grinding machine, the combination of a barrel having a feed mouth, a feed-screw in said barrel, a hopper for said feed mouth, an electric motor for driving said feed-screw, control means for the latter including an electric switch having a movable control part, and a manually movable safety control bar pivoted to said hopper, said manually movable safety control bar provided with an arm normally in obstructing relation with said movable control part for operative relation in the motor circuit, and arranged for being shifted by manual movement of said manually movable safety control bar independent of movement of said hopper and for being shifted with said hopper, both said shifted positions of said arm placing said movable control part for inoperative relation in said motor circuit.

4. In a meat grinding machine, the combination of a barrel having a feed mouth, a feed-screw in said barrel, a hopper for said feed mouth, an electric motor for driving said feed-screw, control means for the latter including an electric switch having a movable control part, and a manually movable safety control bar pivoted to said hopper, said manually movable safety control bar provided with an arm normally in obstructing relation with said movable control part for operative relation in the motor circuit, and arranged for

being shifted by manual movement of said manually movable safety control bar independent of movement of said hopper and for being shifted with said hopper, both said shifted positions of said arm placing said movable control part for inoperative relation in said motor circuit, said movable control part forming an obstruction obstructing return of said arm to such normal relation.

5. In a meat grinding machine, the combination of a barrel, a feed-screw therein, said barrel having a feed mouth communicating with said feed-screw, a hopper on said barrel having a feed opening in registry with said feed mouth, means movably supporting said hopper with relation to said barrel, an electric motor for driving said feed-screw, an electric translating device for controlling the motor circuit of said motor, and means for operating said electric translating device comprising a bar substantially encompassing said hopper and exposed substantially throughout the same to contact by the operator, said bar pivoted to said hopper, and an operating part having operative connection with said translating device and movable by manual pivotal movement of said bar on said hopper and by movement of said bar with said hopper when said hopper is moved on said barrel.

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