June 18, 1929. R. L. O'MEARA 1,717,465

MACHINE FOR TREATING ANIMAL OFFAL AND THE LIKE

Filed Oct. 15, 1925 2 Sheets-Sheet 1

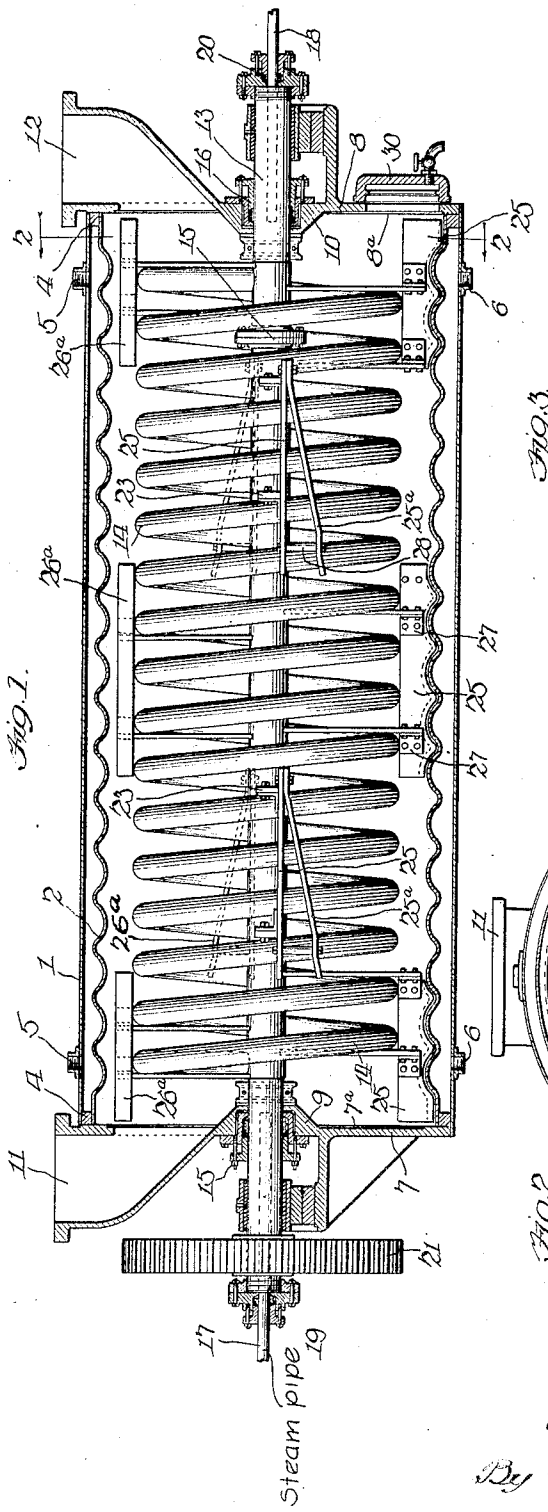


Fig. 1.

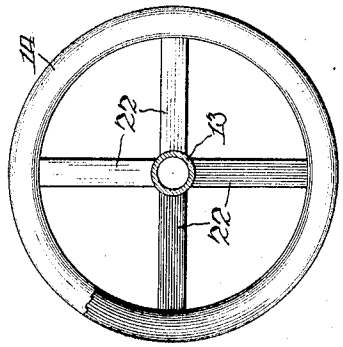


Fig. 3.

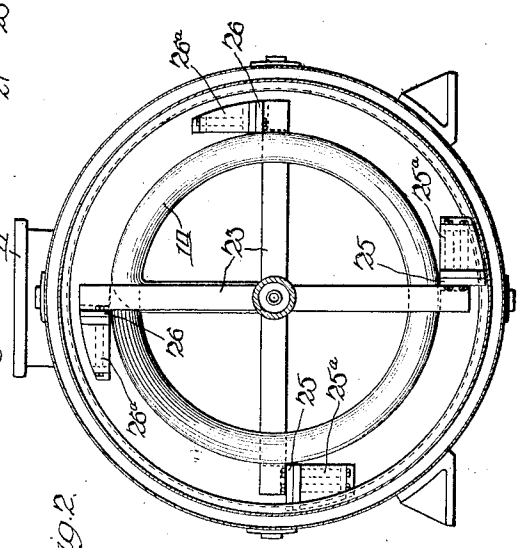


Fig. 2.

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MACHINE FOR TREATING ANIMAL OFFAL AND THE LIKE

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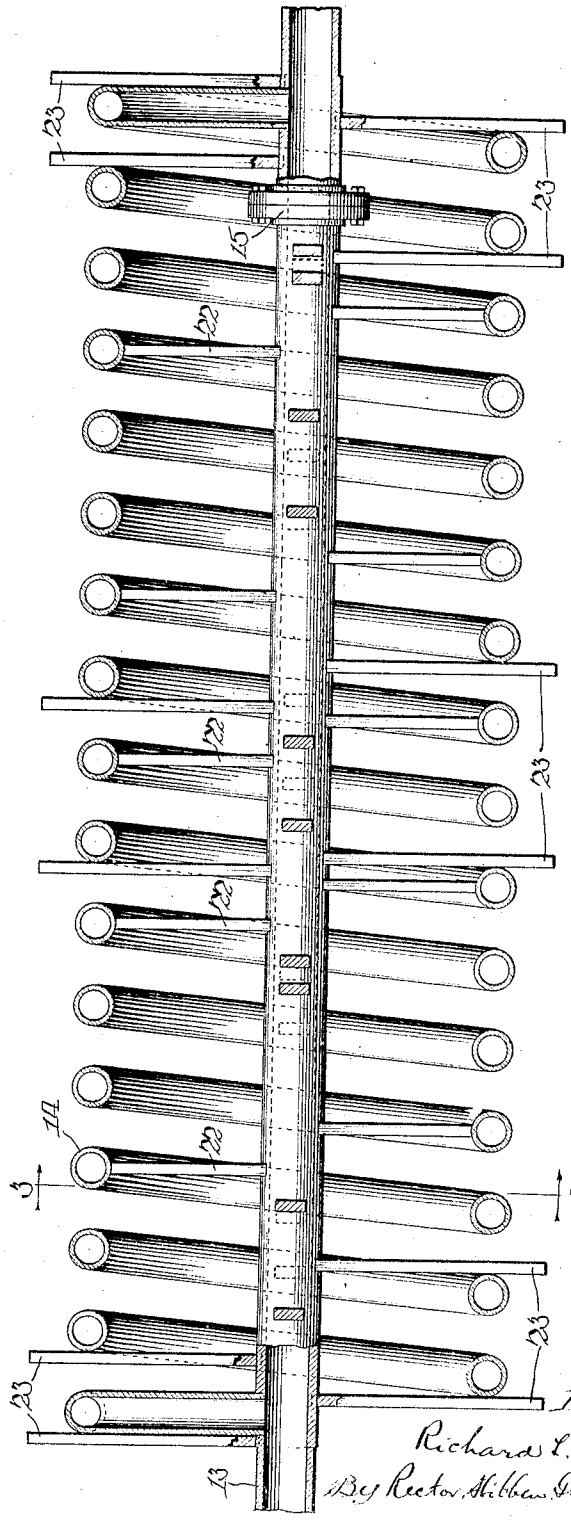


Fig. 1.

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Richard L. O'Meara
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Patented June 18, 1929. 1,717,465

UNITED STATES PATENT OFFICE.

RICHARD L. O'MEARA, OF CHICAGO, ILLINOIS, ASSIGNOR TO MECHANICAL MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MACHINE FOR TREATING ANIMAL OFFAL AND THE LIKE.

Application filed October 15, 1925. Serial No. 62,537.

The purpose of the present invention is to provide an improved rendering apparatus adapted for the rendering of packing house offal and the separation of fat and grease from the other constituents of the material treated. My novel apparatus is more particularly designed for use in carrying out the "dry" process of treating such material, in which the material is subjected to a dry heat to remove the constitutional moisture of the material and melt the fat, which latter is drained off from the material, either at intervals or at the conclusion of the rendering operation. Various modifications in detail of this procedure are known, and my invention does not relate to the particular process employed, but to the construction and arrangement of the parts of the machine, which is designed to be used to accomplish various modes of treatment of the material of the general character above mentioned. The object of my invention is the provision of a rendering apparatus suitable for general use and which because of certain novel features of construction, shall be particularly strong and rugged, possess high efficiency in the application of the heating element, and be provided with stirring elements which shall be effective in operation, constructed to permit ready assembly of the connected parts of the apparatus and operate to discharge the treated material at the conclusion of the rendering operation. With the foregoing and incidental objects and advantages in the construction and arrangement of parts in view I have designed and invented the rendering apparatus illustrated in the accompanying drawings and hereinafter described in detail, the essential elements of my invention being more particularly point out in the appended claims defining my invention.

In the drawings Figure 1 is a longitudinal central vertical section of my novel rendering apparatus; Fig. 2 is a vertical cross-section of the same on the line 2—2 of Fig. 1, looking in the direction of the arrow, all of the parts excepting the central shaft being shown in elevation; Fig. 3 is an elevation of the parts lying to the right of the vertical plane indicated by the dotted line 3—3 of Fig. 4, the arrow indicating the direction in which the parts are viewed; and Fig. 4 is an axial vertical section of the central shaft and heating coil of the machine and arms secured to it by means of which the agitating and discharge blades are supported.

Like reference characters indicate like parts in all the figures of the drawing.

Describing now the construction of my novel rendering apparatus as illustrated in the drawings, the rendering tank or receptacle for the material to be treated includes a stationary cylindrical outer shell 1, and a connected inner shell 2 which broadly speaking is cylindrical in form and formed with circumferential corrugations the two shells being spaced apart and sealed at their ends by spacing rings 4—4 to which both shells are welded. The annular space between the drums forms a steam chamber or jacket into which steam (which is the heating agent universally employed in such apparatus) is admitted through inlet openings 5—5, drain openings 6—6 being provided through which water of condensation may be carried off.

It may here be stated that my apparatus is designed to be used in the rendering of fat-bearing material on a large scale, and in practice a suitable dimension for the outer drum or shell is about five feet in diameter, and twelve feet in length.

The ends of the steam jacket above described are closed and supported by skeleton frame castings 7 and 8, to which are secured metal plates 7^a and 8^a, respectively serving to completely close the ends of the rendering chamber (except for the openings provided for the introduction and removal of the material to be treated), the castings being formed with central hubs, marked 9 and 10, respectively, and large openings, marked 11 and 12 respectively. The openings 11 and 12 may either, or both, be used either as feed openings or as vent openings for the escape of the odors and vapors and steam generated during the rendering process, and whether functioning as feed openings or vents it is desirable that they shall be of ample capacity, as illustrated.

It will be understood that in some cases it may be desirable at some stage of the particular process employed to entirely close the rendering chamber so that pressure may be generated from the water of constitution of the material under treatment and thus produce

more or less distintegration of the material, and that in other cases it may be desired to subject the rendering chamber to a vacuum to hasten evaporation of the water. I therefore contemplate the use of suitable control valves for hermetically sealing the openings 11 and 12, and suitable connection with other apparatus not herein described, for accomplishing the results desired or essential to carry out the particular process in which my novel rendering tank may in a given case be used.

Rotatably mounted in bearings in the hubs 9 and 10 of the end frame members is a rotatable stirring and heating member consisting of a central shaft 13 to which is secured a helical heating coil 14, which is braced and supported by radial arms carrying a series of stirring and discharge elements. The shaft 13 is hollow and at its ends open to the steam supply used for heating the apparatus but at an intermediate point, marked 15, the passage of steam directly through the shaft is blocked by a suitable plug, or a solid section, or any desired form of construction for accomplishing the purpose. On opposite sides of the blocked section of the shaft the ends of the coil 14 are welded to the shaft so that the passage within the coil is in communication with the steam supply. As shown, the bearings of the shaft 13 in the hubs are packed by means of suitable glands 15ª and 16, respectively, to form steam tight joints hermetically sealing the rendering compartment of the machine. The steam is admitted to the hollow shaft and heating coil through steam pipes 17 and 18 which pass through suitable packed joints marked 19 and 20, respectively, arranged to permit rotation of the shaft and parts carried thereby. The shaft 13 is rotated, in the present instance, by a gear wheel 21 secured to one end thereof, and is arranged to be turned in either direction, as desired, by suitable operating connections, not necessary to be here described.

At one end and at the lower side of the rendering chamber a discharge opening is provided, in the present instance this opening being formed in the frame casting 8 and arranged to be closed by a door 30. An outlet is provided for drainage of the melted fat, and in some cases, in accordance with the particular practice being followed, for the drainage of water resulting from disintegration of the material being treated, this outlet in the present case being formed in the door 30 near its bottom.

In the practical use of my rendering apparatus, the rendering chamber will ordinarily be filled to from one-half to two thirds of its total capacity with the offal to be rendered, which material will offer a very considerable resistance to the rotation of the coil and scraper blades later to be described, and it is therefore essential to provide a particularly strong and rigid support for such member. This I accomplish by means of a series of radial flat supporting arms 22 which are spaced axially along and are welded to the shaft 13, and are also welded to the inner faces of the coil 14. These arms are set edgewise, that is, with their side faces parallel to their plane of movement, and thus afford maximum strength in imparting a movement of rotation to coil 14 while adding minimum resistance to movement through the material.

In addition to the arms 22, I employ a series of flat stirrer arms 23 which are also axially spaced and set edgewise and welded to the shaft 13 in the same manner as the arms 22 but the side faces of which are welded to the sides of adjacent turns of the coil 14 and at their ends are equipped with agitating blades, comprising scraping and stirring blades, both kinds of which blades act to agitate and stir the material, and with discharge blades as will next be described.

In the present instance I have provided ten sets of double paddles or blades, each set including an agitating blade and an associated discharge blade, the sets of associated blades and the stirrer arms which support the several sets being arranged in pairs diametrically opposite each other. Each set of blades includes either a scraping blade 25 and an associated discharge blade 25ª, or a stirring blade 26 and associated discharge blade, marked 26ª, secured together and supported at the end of a pair of the arms 23. As shown in the drawing the scraping blade (marked 25) at the outer end of one pair of arms 23 is formed with a corrugated edge, and this blade is set to have very slight clearance with the corrugated inner shell 2, while the diametrically opposite stirring blade, (marked 26) is formed with a straight edge and has sufficient clearance inside the corrugation to permit the entire rotating structure to be inserted inside the drum structure by radial displacement of the shaft 13 with reference to the axis of the drum.

The scraping blades 25 and stirring blades 26 are disposed parallel with the axis of rotation of the shaft 13, while the associated discharge blades 25ª and 26ª are set at an angle thereto.

The blades 25 and 26 may be secured to the arms 23 in any manner which is sufficiently strong and secure, and in the present instance I employ angle clips 27 which are each riveted both to the particular arm and to the blade 25 or 26, as the case may be, and weld the one end of the discharge blade to the associated scraping or stirring blade and connect the other end of such discharge blade to the scraping blade by a spacing strut or bolt 28. The arms 23 and the scraping or stirring blades may, however, be riveted or bolted together if desired.

It is obvious that when the coil and blade structure is rotated to drive the blades 25 and

26 against the material the material will be agitated without substantial displacement laterally by the blades, while when rotated in the opposite direction (which is done when it is desired to discharge the material through the discharge door 30, which is opened for the purpose) the action of the inclined discharge blades 25[a] and 26[a] will work the material towards the discharge opening. The inclination of the coil 14 is in the present instance such as to oppose the discharging action of the discharge blades, but the effect of this coil is relatively slight, and is overcome by the action of the discharge blades when the coil is reversely rotated to discharge the contents of the rendering chamber.

The axial spacing and edgewise disposition of the flat arms 22 and 23 with reference to their path of rotation is conducive to comminution of the material under treatment, and also affords maximum strength and rigidity against torsional strain due to resistance offered by the material.

I claim:

1. A machine for treating animal offal and the like having a cylindrical rendering chamber and having agitating and heating means arranged within said chamber including a rotatably mounted hollow shaft communicating with a source for supplying steam, and a spiral coil arranged concentrically of and secured to and communicating with the interior of said shaft, and a plurality of axially spaced flat radial arms set to rotate edgewise and severally welded to said shaft and inner faces of the turns of the coil, and a plurality of other axially-spaced flat radial arms also set to rotate edgewise and projecting beyond said coil and severally welded to said shaft and side faces of the turns of the coil, and agitating blades secured to the ends of said last mentioned arms.

2. A machine for treating animal offal and the like having a horizontal cylindrical rendering chamber, and having agitating and heating means arranged within said chamber including a rotatably mounted hollow shaft communicating with a source for supplying steam, a spiral coil arranged concentrically of and secured to and communicating with the interior of said shaft, a plurality of axially spaced radial arms severally welded to said shaft and side faces of the turns of said coil and projecting beyond said coil, said radial arms being also angularly spaced about the shaft whereby a pair of adjacent arms and the segment of the coil between the points of attachment of said arms have a mutual bracing action and agitating blades secured to the ends of said arms.

3. A machine for treating animal offal and the like having a horizontal cylindrical rendering chamber, agitating and heating means arranged within said chamber including a rotatably mounted hollow shaft communicating with a source for supplying steam, a spiral coil arranged concentrically of and secured to and communicating with the interior of said shaft, a plurality of axially spaced radial arms arranged in pairs severally welded to said shaft and side faces of the turns of said coil and projecting beyond said coil, and a plurality of agitating blades each secured to the ends of a pair of said arms.

4. A machine for treating animal offal and the like having a horizontal cylindrical rendering chamber and having agitating and heating means arranged within said chamber including a rotatably mounted hollow shaft communicating with a source for supplying steam, a spiral coil arranged concentrically of and secured to and communicating with the interior of said shaft, a plurality of axially spaced flat radial arms set to rotate edgewise and arranged in pairs and projecting beyond said coil and severally welded to said shaft and side faces of the turns of the coil, and agitating blades each secured to the ends of one pair of said arms.

5. A machine for treating animal offal and the like having a horizontally arranged rendering chamber formed with circular end walls and a connecting circumferentially corrugated wall, and having within said chamber agitating mechanism including a central shaft and a plurality of blades supported by said shaft and formed each with an undulating scraping edge corresponding in outline to the corrugations of said connecting wall and arranged adjacent thereto and a plurality of stirring blades also supported by and spaced nearer the shaft than said first-mentioned blades and angularly spaced with respect to such first-mentioned blades to permit radial displacement of the shaft and clearance of the blades in assembling the shaft and blades as a whole.

6. A machine for treating animal offal and the like having a horizontally arranged rendering chamber formed with circular end walls and a connecting circumferentially corrugated wall, and having agitating mechanism including a central shaft and a plurality of blades supported by said shaft and formed each with an undulating scraping edge corresponding in outline to the corrugations of said connecting wall and arranged adjacent thereto and a plurality of stirring blades also supported by and spaced nearer the shaft than said first mentioned blades and arranged diametrically opposite said first mentioned blades to permit radial displacement of the shaft and clearance of the blades in assembling the shaft and blades as a whole.

7. A machine for treating animal offal and the like having a horizontal cylindrical rendering chamber, agitating and heating means

arranged within said chamber including a rotatably mounted hollow shaft, a spiral coil arranged concentrically of and secured to and communicating with the interior of said shaft communicating with a source for supplying steam, radial arms secured to said shaft and side faces of the turns of said coil and projecting beyond said coil, and associated agitating and discharge blades secured to pairs of said arms, said agitating blades being set transverse to the plane of rotation of said shaft and said discharge blades being set obliquely thereto.

RICHARD L. O'MEARA.

CERTIFICATE OF CORRECTION.

Patent No. 1,717,465. Granted June 18, 1929, to

RICHARD L. O'MEARA.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, line 2, claim 7, after the word "shaft" and before the comma, insert the words "communicating with a source for supplying steam" and strike out the same in lines 5 and 6, same page and claim; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 30th day of July, A. D. 1929.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)