(No Model.) 5 Sheets—Sheet 1.

# J. MONTO.

## MACHINE FOR IMMERSING TINNERS' ARTICLES IN THE GREASE POT.

No. 421,599. Patented Feb. 18, 1890.

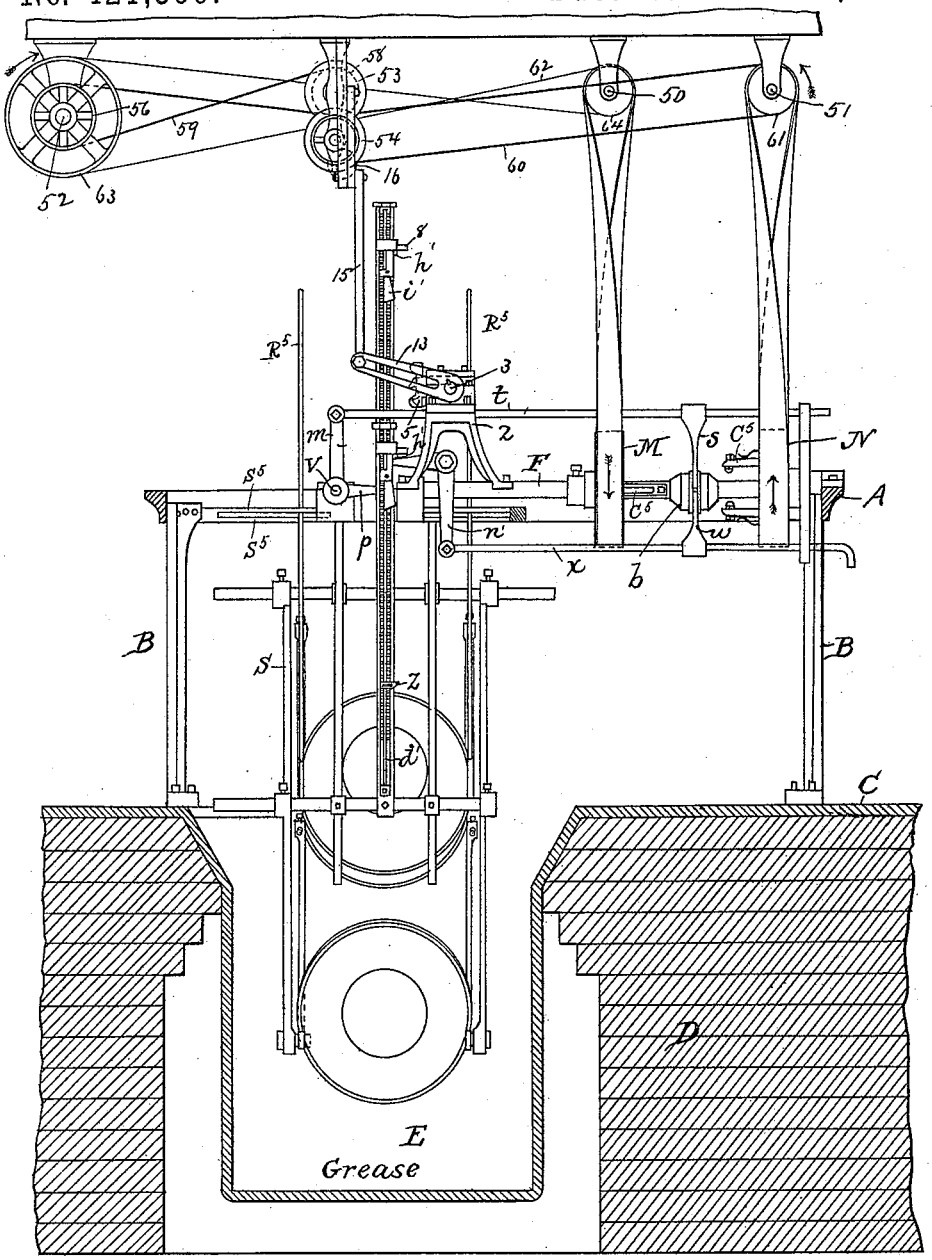


FIG. 1.

WITNESSES.
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W. G. Ramsay.

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by Wright Brown Quinby & Atty's.

(No Model.) 5 Sheets—Sheet 2.

# J. MONTO.

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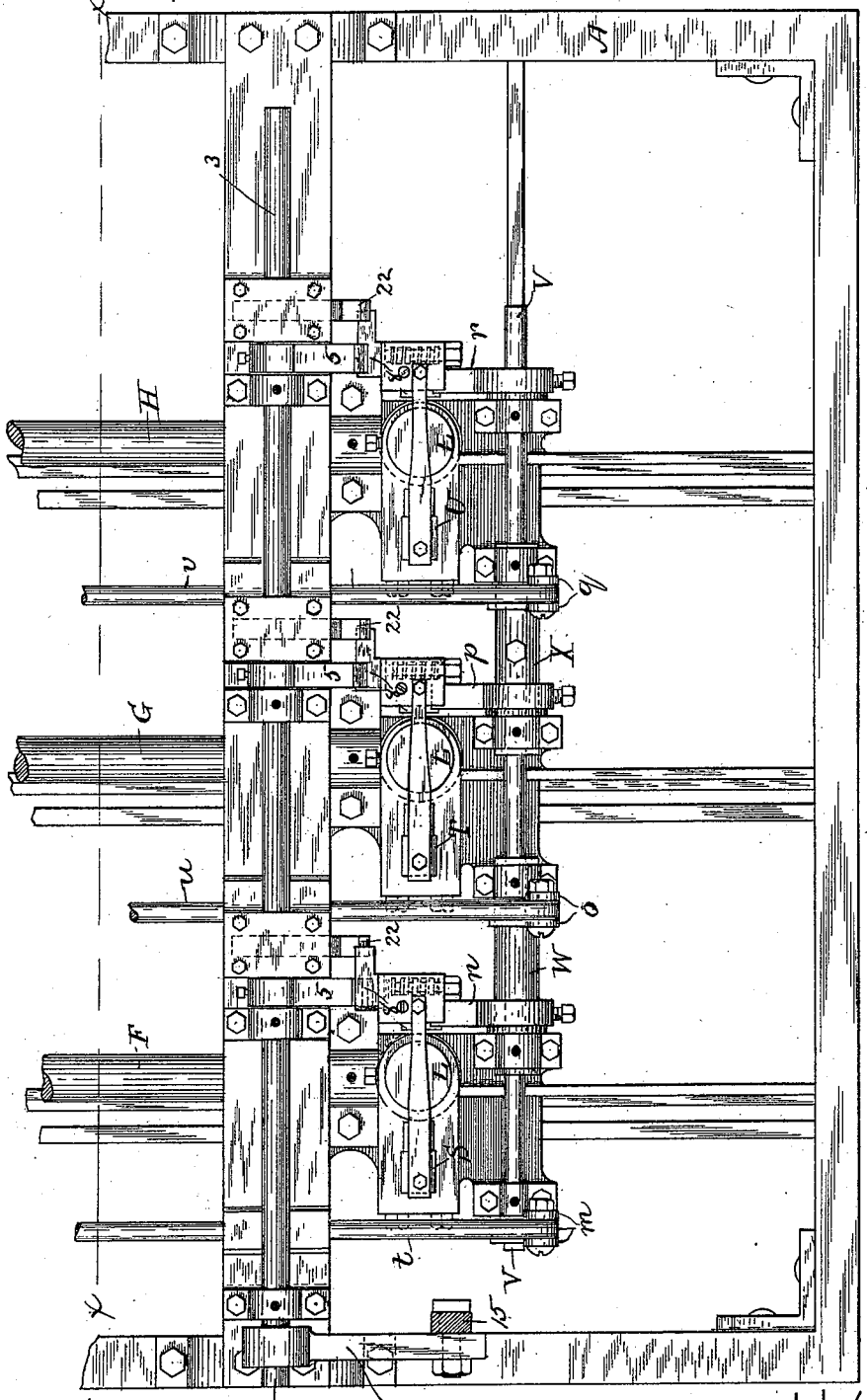


FIG. 2.

WITNESSES.
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(No Model.) 5 Sheets—Sheet 3.

# J. MONTO.

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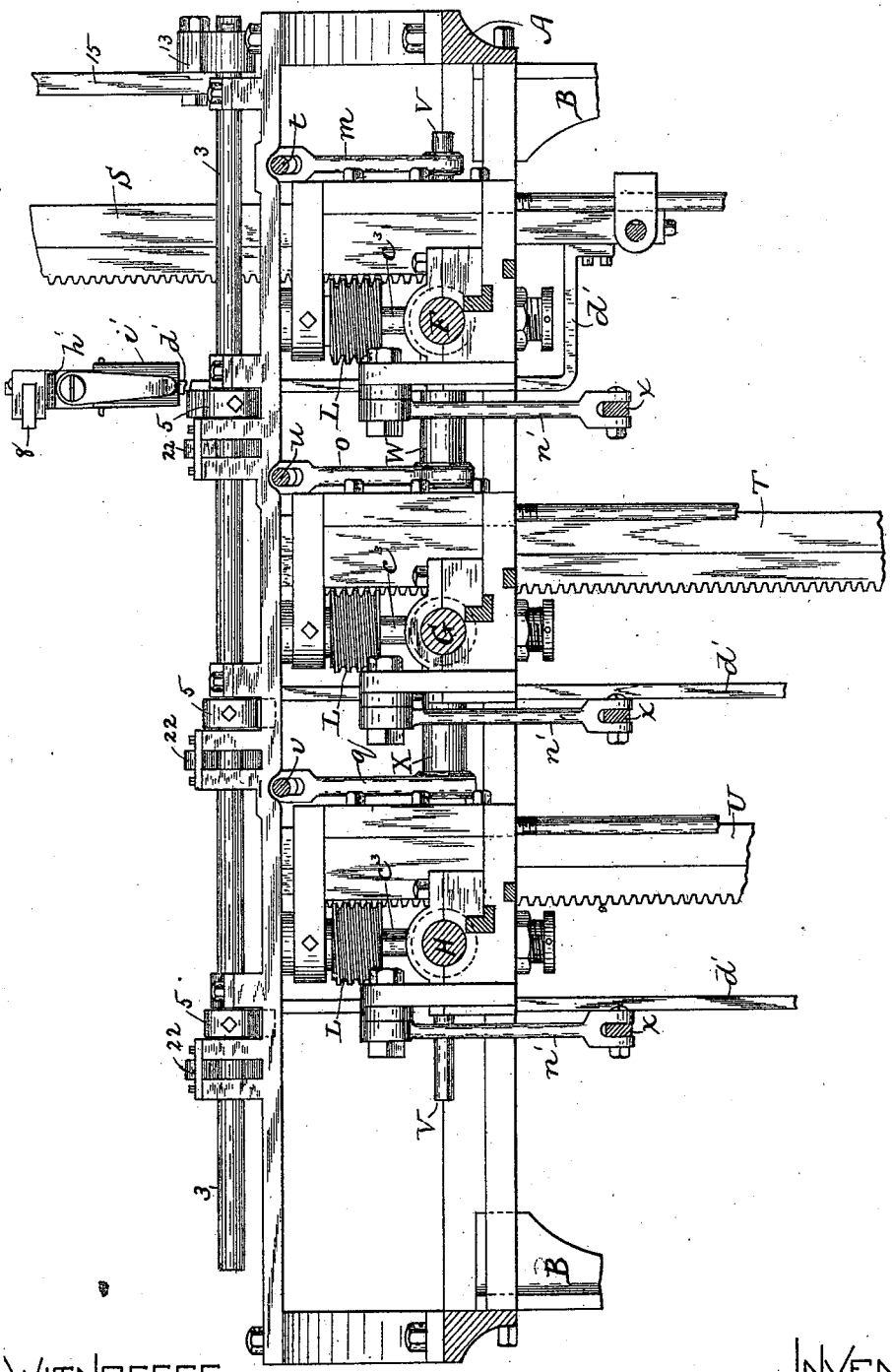

FIG. 3.

WITNESSES:
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(No Model.) 5 Sheets—Sheet 4.

# J. MONTO.

## MACHINE FOR IMMERSING TINNERS' ARTICLES IN THE GREASE POT.

No. 421,599. Patented Feb. 18, 1890.

FIG. 4.

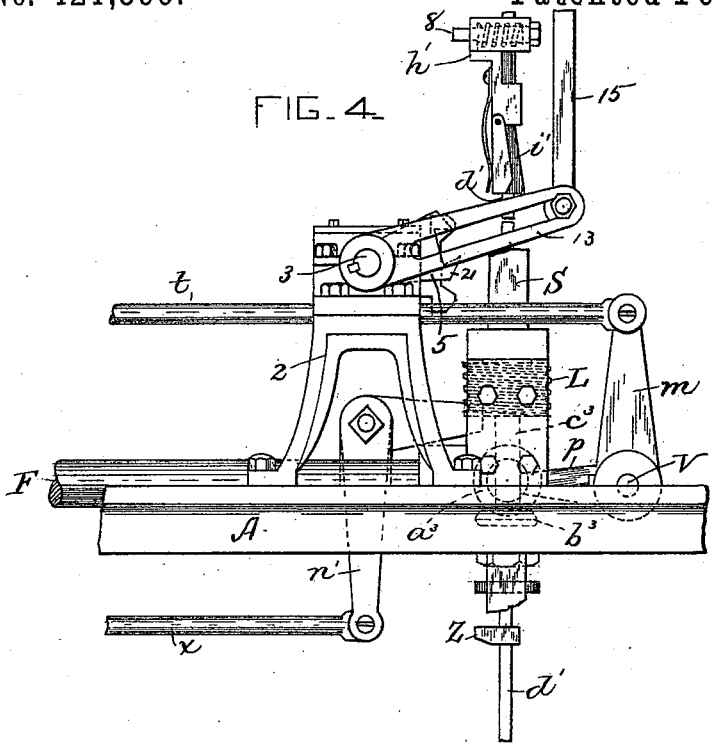
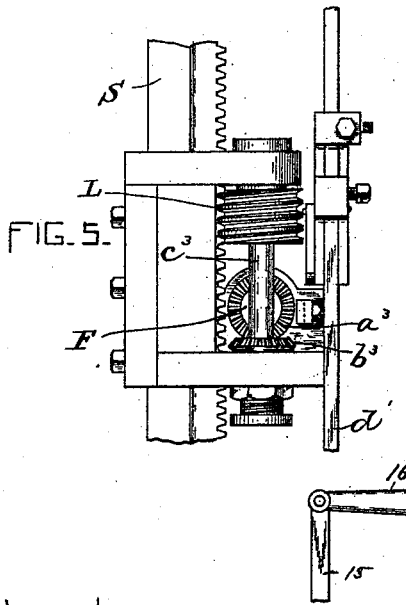



FIG. 5.



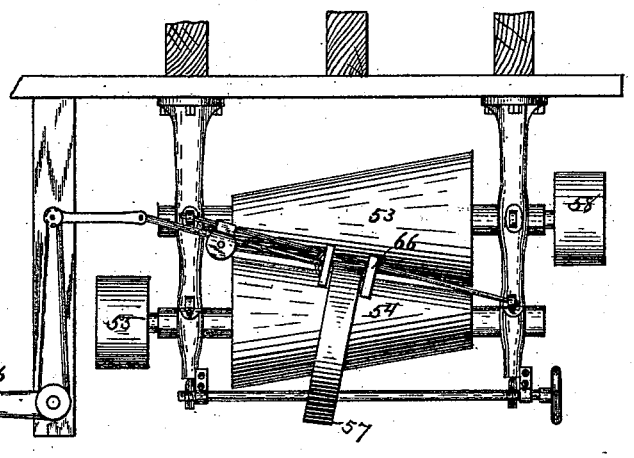




FIG. 6.

WITNESSES.
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(No Model.) 5 Sheets—Sheet 5.

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## MACHINE FOR IMMERSING TINNERS' ARTICLES IN THE GREASE POT.

No. 421,599. Patented Feb. 18, 1890.

FIG. 7.

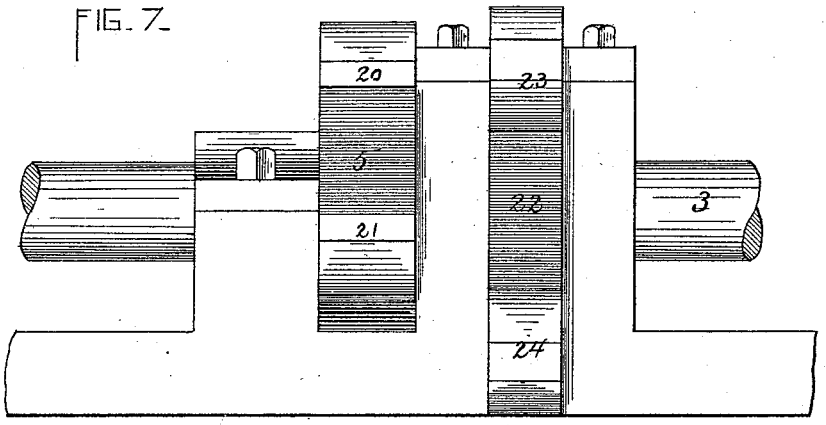



FIG. 8.

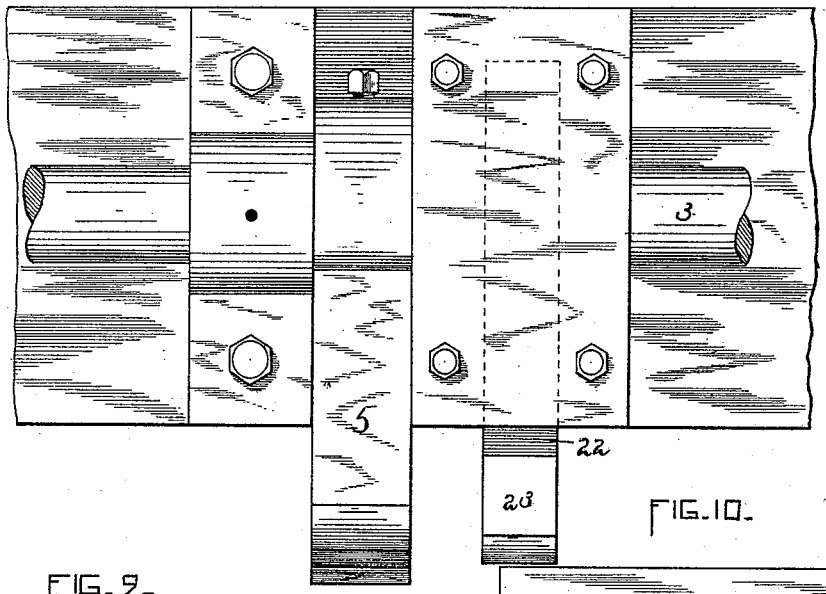



FIG. 9.

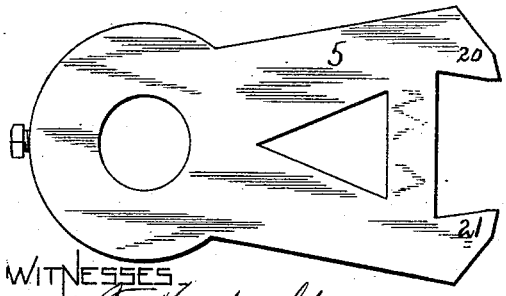
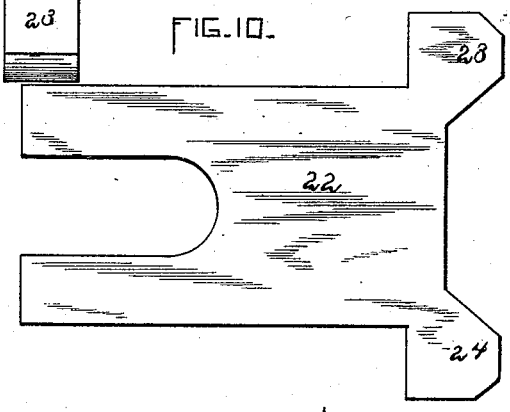



FIG. 10.




WITNESSES.
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INVENTOR.
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Attys.

# UNITED STATES PATENT OFFICE.

JOSEPH MONTO, OF CHELSEA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE STEEL EDGE STAMPING AND RETINNING COMPANY, OF BOSTON, MASSACHUSETTS.

## MACHINE FOR IMMERSING TINNERS' ARTICLES IN THE GREASE-POT.

SPECIFICATION forming part of Letters Patent No. 421,599, dated February 18, 1890.

Application filed May 31, 1889. Serial No. 312,767. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH MONTO, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Immersing Tinners' Articles in the Grease-Pot, of which the following is a specification.

This invention relates to the operation of tinning or retinning pans and other articles made of tinned metal sheets or plates, and particularly to the operation of finishing the final coating of tin, which is applied to the finished article to cover the marks and defacements received by the original tin coating of the sheet metal during the processes of manufacture. It is customary to dip the formed article into a bath of tin and then to immerse it in a bath of hot grease for the purpose of making the second coating of tin smooth and uniform by melting portions of it, and preventing it from forming ridges or protuberances on the surface of the article. Much difficulty has been experienced in the retinning operation on account of the tendency of the grease, which is necessarily dark colored and impure from long use, to adhere to the upper portion of the article when the latter is being withdrawn from the bath and leave a stain on the article, which stain cannot be removed without remelting the tin coating.

The chief object of my present invention is to obviate this difficulty; and to this end it consists in the combination, with mechanism for lowering tinned articles into a grease bath and raising them therefrom, of automatic means for varying the speed of the upward movement of the articles from the grease-bath, giving the articles a slow movement when they begin to rise and until their upper portions break through the surface of the grease, the upward movement being then accelerated, so that the articles leave the bath at a comparatively rapid rate. I find that the slow movement of the articles in starting enables their upper edges to break through the grease without taking up a coating or film of the grease, the tinned surfaces being entirely free from discoloration. After the emergence of the upper edges and the separation of the same from the grease the upward movement may be as rapid as may be desired for speed of operation, there being no tendency of the grease to adhere to the articles after their upper edges have broken through the surface of the bath.

For the purpose of illustrating my invention and showing one way in which it may be carried into practice I have shown mechanism for which Letters Patent of the United States No. 372,555 were granted to me November 1, 1887, together with certain mechanism not shown in said patent for automatically varying the speed of the upward movement of the tinned articles from the bath, the whole constituting an efficient and practical organized machine embodying the combination which constitutes my present invention.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a machine embodying my invention, parts being shown in section. Fig. 2 represents a top view of a portion of the same on a larger scale. Fig. 3 represents a section on line *x x*, Fig. 2, looking toward the right in said figure. Fig. 4 represents an end view of the mechanism shown in Fig. 2. Fig. 5 represents a side view showing the gearing that connects one of the racks with the shaft that drives it. Fig. 6 represents a side view of the speed-varying device shown in end view in Fig. 1. Figs. 7, 8, 9, and 10 represent details.

I will first briefly describe the portions of the machine which are shown in my patent, No. 372,555, above mentioned.

E represents the grease-pot, supported by a suitable setting D, of masonry, and located over a furnace.

A represents a frame located over the grease-pot and supported by legs or standards B, which are attached to the bed or support C on the setting D. Journaled in suitable bearings on the frame A are three parallel shafts F G H, each of which is provided with two loose pulleys M N, Fig. 1, which are continu-

ously driven in opposite directions by belts from continuously-rotated counter-shafts 50 and 51, Fig. 1. Each of said pulleys has a clutch whereby it may be made fast upon its shaft, and on each shaft, between the two pulleys thereon, is a sliding sleeve *b*, which is movable endwise and is adapted when moved to one end of its stroke to connect one pulley to the shaft and cause the shaft to rotate in one direction with said pulley, and when moved to the opposite end of its stroke to connect the shaft with the other pulley and cause the shaft to rotate in the opposite direction. When said sleeve is in an intermediate position, both pulleys are loose on their shaft and the latter does not rotate. The clutch mechanisms on said pulleys (shown at $C^5$ $C^5$, Fig. 1) are fully shown and described in my former patent and do not require detailed description here.

The tinned articles, which I will call "dishes," to be treated are supported in frames or holders constructed as shown in my former patent and attached to vertical racks S T U. Said racks are fitted to slide vertically in suitable fixed guides, and are connected, respectively, with the shafts F G H by suitable gearing, so that the rotation of each shaft will move the accompanying rack and its dish-holders up or down, as the case may be. The said racks, instead of meshing with pinions attached directly to the shafts F G H, as in my former patent, mesh with the worm-gears L on short vertical shafts $c^3$, said shafts $c^3$ having bevel-gears $b^3$, meshing with bevel-gears $a^3$ on the shafts F G H. The vertical shafts $c^3$ are mounted in suitable fixed bearings on the supporting-frame A. To each rack is attached an arm $d'$, carrying at its upper end a fixed dog $h'$, at its lower end a fixed dog Z, and between said dogs a pivoted spring-pressed catch $i'$, said dogs and catch being constructed as described in my former patent and moving the clutch-operating sleeves *b* on the shafts F G H through the intermediate devices described in said patent, so that each rack, after being set in downward motion by an attendant, causes the automatic upward motion of another rack, then its own stoppage at the lower end of its movement until it is set in upward motion by the descent of another rack, and finally its own stoppage at the end of its upward movement.

Accompanying each sleeve *b* is a rod *x*, adapted to slide lengthwise in guides on the supporting-frame. Said rods *x* are provided with forks *w*, engaging the sleeves *b*, so that the endwise movement of either rod *x* will move the sleeve *b* engaged therewith into the engagement with the clutch mechanism of either the pulley M or the pulley N on the shaft that supports the sleeve *b*. The rods *x* project at one end of the frame A, and in the operation of the machine each shaft F, G, or H is set in motion by the operator moving the rod *x* engaged with the sleeve *b* of that shaft inwardly until said sleeve engages the clutch of the pulley M. To the inner end of each rod *x* is pivoted the lower arm of a bell-crank lever $n'$, the upper arm of which is in position when the rod *x* and sleeve *b* are in the position last described, (sleeve *b* engaged with clutch of pulley M,) to be struck by the corresponding dog $h'$ during the latter part of the descent of the rack carrying said dog and turned to move the sleeve *b* through rod *x* out of engagement with the clutch of pulley M, thus stopping the descent of the said rack by stopping the rotation of the shaft through which motion is imparted to the same. Each rack is stopped in the manner described at the end of its downward movement until its operating-shaft is engaged with the rack-raising pulley N thereon by the downward movement of the catch $i'$ accompanying another rack. Assuming the downwardly-moving rack to be the rack T, said catch strikes an arm *p*, which is affixed to a tubular shaft X, mounted on a shaft V, which is journaled in fixed bearings. To the shaft X is affixed another arm *q*, which is pivoted to a rod *v*, the latter having a fork *s*, which engages the sleeve *b* on the third shaft H G. The contact of catch $i'$ with arm *p* partly rotates shaft X and moves rod *v*, so as to force the sleeve *b* engaged therewith into engagement with the clutch of pulley N on shaft H, thus causing the rotation of the latter and the upward movement of the rack U engaged therewith. The descent of each rack therefore starts another rack upwardly, the third rack U starting the first rack S by contact of the catch $i'$ accompanying said rack U with an arm *r* on shaft V, such contact partly rotating shaft V and causing an arm *m* on its opposite end to move the sleeve *b* on the first shaft F through a rod *t*, connected with arm *m*, into engagement with the clutch of pulley N on shaft F. The first rack S starts the second rack T by contact of the catch $i'$ accompanying said rack S with an arm *n* on a tubular shaft W, which is mounted on shaft V and has an arm *o*, which is connected by a rod *u* with the sleeve *b* on the second shaft G, the said sleeve being thus moved into engagement with the pulley N of shaft G. When each rack reaches about the highest point of its movement, the dog Z, moving therewith, strikes the under side of the upper arm of the accompanying bell-crank lever $n'$ and moves said lever and the rod *x* connected therewith sufficiently to throw the sleeve *b* engaged with said rod out of engagement with the clutch of the pulley N on the shaft supporting said sleeve, and leave said sleeve midway between the two pulleys of said shaft, thus stopping the movement of the rack, the same remaining at rest in its elevated position until the operator moves the accompanying rod *x*, and thus starts said rack downwardly. Each rack, therefore, is put in downward motion by an attendant, starts the next rack upwardly during its descent, is automatically stopped at the conclu-

sion of its downward movement until started upwardly by the descent of another rack, and is finally stopped at the end of its upward movement until the operator elects to put it again in downward motion.

I have thus described the operation of the machine as it existed prior to my present invention to avoid the necessity of reference to my former patent for a full understanding of this invention, but have not deemed it necessary to describe various minor details of construction shown in said patent—such, for example, as the rods $R^5$ and bars $S^5$, which effect the tapping of the tinned articles, said rods and bars being lettered, respectively, $t'$ and $u'$ in my former patent.

In carrying out my present invention as applied to said machine I provide automatic means for varying the speed of the counter-shaft 51, through which motion is imparted to the pulleys N, which raise the racks S T U, so that the upward movement of each rack will be slower at the start and will be more rapid after the tinned articles have broken through the grease. To this end I interpose between the main shaft 52 and said counter-shafts a pair of cone-pulleys 53 54, one of which 53 is driven by a crossed belt 59, running from a pulley 56 on the main shaft 52 to a pulley 58 on the shaft of pulley 53. The other cone-pulley 54 is driven by friction through a friction-band 57, interposed between the two cone-pulleys. The shaft of pulley 54 has a pulley 55, which is connected by a belt 60 with a pulley 61 on the counter-shaft 51. The counter-shaft 50 is driven by a belt 62 running from a pulley 63 on the main shaft to a pulley 64 on the counter-shaft 50.

It will be seen that the cone-pulley 53 is driven at a uniform speed from the main shaft, while the speed of the cone-pulley 54, driven by friction through the band 57, depends on the position of said band, the latter being movable between and endwise of the pulleys, so as to connect the smaller end of 53 with the larger end of 54, or vice versa. When the band 57 is between the smaller end of the pulley 53 and the larger end of the pulley 54, the latter is rotated at the slowest rate and imparts a correspondingly slow rotation to the counter-shaft 51; but as the band is moved toward the larger end of the pulley 53 and the smaller end of the pulley 54 the speed of the latter is increased, as will be readily seen.

The band 57 is adjusted by means of a shipper 66, which is operated by a connection with a bell-crank lever 16 to throw the band in either direction, and thus increase or decrease the speed of the pulley 54. Said bell-crank lever is connected by a rod 15 with an arm 13, which is affixed to a horizontal rock-shaft 3, journaled in bearings supported by brackets 2 on the frame A, said rock-shaft being located above and arranged at right angles with the rack-operating shafts F G H.

To the rock-shaft 3 are affixed a series of arms 5, corresponding in position and number to the racks S T U. Supported by the arm $d'$ of each rack and located just above the dog $h'$ is a movable bolt 8, which is projected by a spring and arranged so that when either rack descends the bolt 8, moving therewith, will strike one of the arms 5 of rock-shaft 3 just before the rack reaches its lowest point, and turn said rock-shaft so as to depress the lever 13 and rod 15, and thereby turn the bell-crank lever 16 so as to move the band 57 to the smaller end of the pulley 53, the speed of the counter-shaft 51 and of the rack-raising pulleys N being thus reduced. During the upward motion of the next rack (caused, as already described, by the catch $i'$ of the descending rack and the devices acted on by said catch) the bolt 8 of the ascending rack strikes the under side of another arm 5 on the rock-shaft 3 after the rack has risen far enough at a slow rate to enable the dishes carried thereby to break through the surfaces of the grease, and thereby turn the rock-shaft 3 in the direction to raise the rod 15, and through the bell-crank lever 16 and band-shipper 66 move the band toward the larger end of the pulley 53, thereby increasing the speed of the upward movement of the rack now being considered, so that the upward movement of said rack is slow for the first few inches, and is then made rapid until its end is reached. It will be seen, therefore, that the downward movement of each rack decreases the speed of the counter-shaft that raises the racks, and that the next rack that rises moves slowly at first in consequence of such decreased speed, and then operates through the intermediate mechanism to increase the speed of said counter-shaft, said increased speed continuing until it is decreased by the downward movement of another rack.

To disengage the spring-bolts 8 of each rack from the rock-shaft arm 5 with which it co-operates after said arm and the rock-shaft 3 have been given the required movement in either direction, I provide a tripping device for each bolt 8, whereby the bolt is forced back from and caused to pass by the arm 5, both in its downward and in its upward movement, after said arm has been moved the required distance. Each of said tripping devices (one of which is shown enlarged in Figs. 7 to 10) is an arm or plate 22, affixed to one of the bearings in which the rock-shaft 3 is journaled, and is provided with projections 23 24, having inclined faces. The arm 5 has shoulders 20 21, one of which is struck by the bolt 8 when the latter is descending and the other by said bolt when it is ascending. The projection 23 on the tripping-arm 22 is arranged to force back the descending bolt 8 and prevent it from striking the upper projection 20 of the rock-shaft arm 5, said bolt springing forward after passing the projection 23 into position to engage the lower projection 21 of arm 5 and move the

latter downwardly. The lower projection 24 of the tripper-arm forces back the bolt 8 during its downward movement and disengages said bolt from the lower projection of arm 5 when said arm has been given a sufficient downward movement. When the bolt 8 is ascending, the lower projection 24 of the tripper-arm throws back the bolt and prevents it from acting on the lower projection 21 of the arm 5, and after the bolt has raised the arm 5 sufficiently by engagement with its upper projection 20 the projection 23 of the tripper-arm throws back the bolt and causes it to release and pass by the arm 5.

The machine has the devices described and shown in my former patent for tilting or tipping the pans while they are in the bath.

I do not limit myself to the details of mechanism herein shown and described, but may vary the same in many particulars without departing from the spirit of the invention.

If desired, only one rack or section of the machine may be operated at a time, in which case the devices through which the descending rack acts to start another rack upwardly should be disconnected or made inoperative. Two racks or sections may be operated conjointly instead of the entire number. The thickness of the coating of the tin left on the articles after their removal from the bath is dependent on the length of the period of immersion in the bath. When all the racks are in operation, the period of immersion in the bath will be longer than when a less number is in operation; hence more of the tin coating will be removed by the melting action of the hot grease when all the sections are in operation than when one or two of the racks or sections are operated.

The conical pulleys 53 54, the band 57, and the shipper for moving said band constitute a well-known device for varying speed transmitted from a driving-shaft to a counter-shaft. I do not limit myself to this particular speed-varying means, but may use any other suitable means for accomplishing the same purpose, and in combination with any other suitable means for raising and lowering the articles from and to the bath.

In another application filed concurrently herewith and serially numbered 312,768 I show a different organization of mechanism for moving tinned articles into a grease-pot and withdrawing them at a varying speed which is slow in starting and is increased after the articles have partly emerged from the bath, and I desire to be understood as including in the scope of the first claim of this application any equivalent means—such, for example, as those described in my other application just referred to.

I claim—

1. The combination of a grease pot or bath, a carrier for tinned articles, mechanism for moving said carrier into and out of the said bath, and automatic mechanism for varying the speed of the carrier during its upward movement, whereby the tinned articles in rising break slowly through the surface of the bath and then rise at a more rapid rate, as set forth.

2. The combination of a grease pot or bath, a rack having holders for tinned articles, a shaft connected by gearing with said rack, two loose pulleys on said shaft, clutches whereby said pulleys may be locked to the shaft, mechanism for alternately operating said clutches, counter-shafts rotated in opposite directions from a main shaft and belted to said pulleys, and mechanism for varying the speed of one of said counter-shafts, whereby the rack is raised at a varying speed, as set forth.

3. The combination of a grease pot or bath, a series of racks having holders for tinned articles, a series of shafts connected by gearing with said racks, two loose pulleys on each shaft rotated in opposite directions and provided with clutches, whereby they may be locked to the shafts, mechanism for operating said clutches, two counter-shafts rotated in opposite directions and belted the one to one series of pulleys and the other to the other series, a speed-varying device intermediate of the rack-raising shaft and the motor that drives the same, and automatic means for operating said speed-varying device, whereby the rack-raising counter-shaft is driven at different speeds, as set forth.

4. The combination of the counter-shafts 50 and 51, the cone-pulley 53, driven by a main shaft, the cone-pulley 54, belted to the counter-shaft 51 and driven by a friction-band interposed between it and the pulley 53, means for rotating the shaft 50 at a uniform rate and in a direction opposite to the rotation of the shaft 51, vertically-movable racks, the shafts geared thereto and provided with loose pulleys M N, belted, respectively, to the shafts 50 51, clutches for connecting said pulleys with their shafts, mechanism, substantially as described, for operating said clutches alternately, a rock-shaft 3, having arms 5, spring-bolts moving with the racks arranged to act on the arms 5, tripping devices for said bolts, and devices connecting the said rock-shaft with the friction-band 57, whereby the movements of the rock-shaft caused by the movements of the racks are caused to adjust said band between the cone-pulleys, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 16th day of May, A. D. 1889.

JOSEPH MONTO.

Witnesses:
C. F. BROWN,
A. D. HARRISON.