

Aug. 9, 1949.

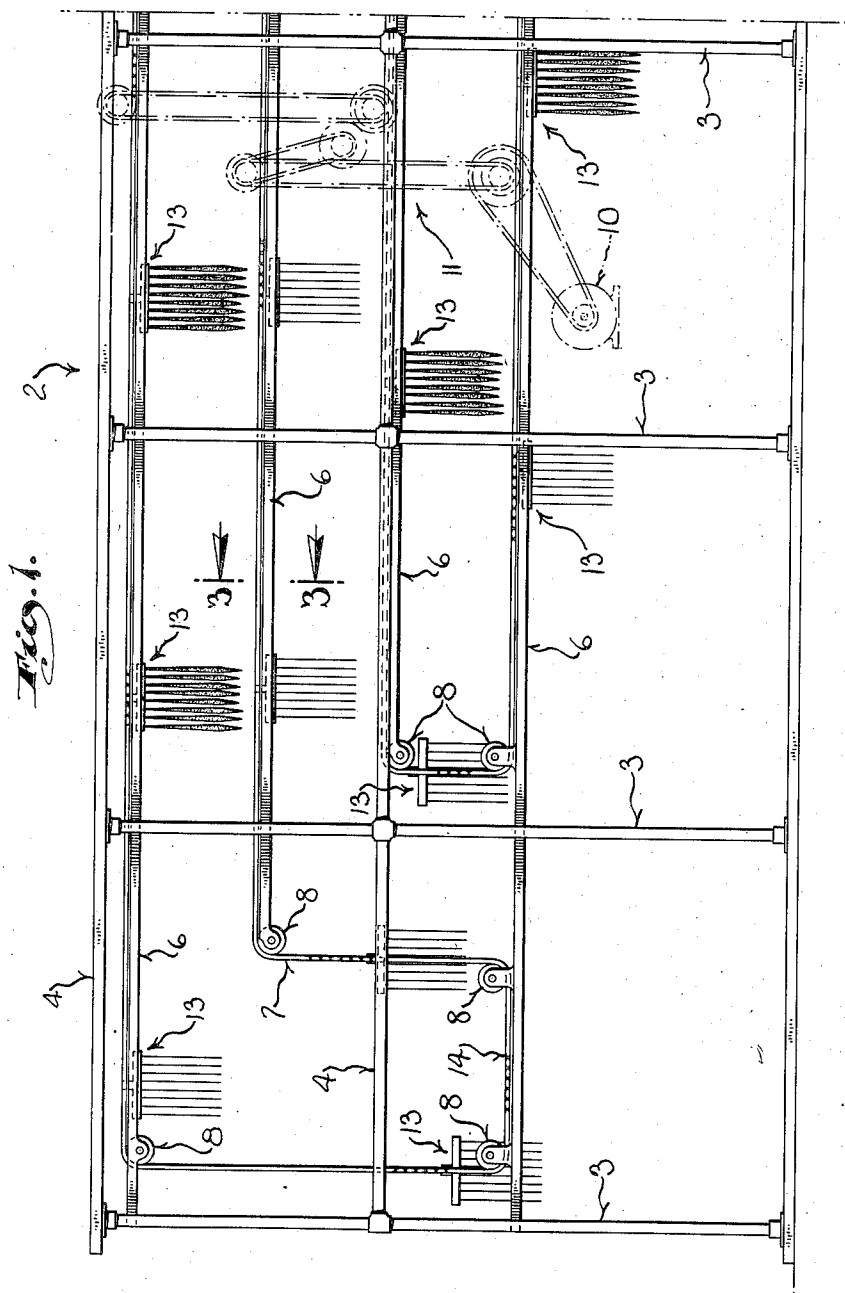
A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 1



Inventor
Alfred E. Moore
by *Dr. Milton Jones*
attorney

Aug. 9, 1949.

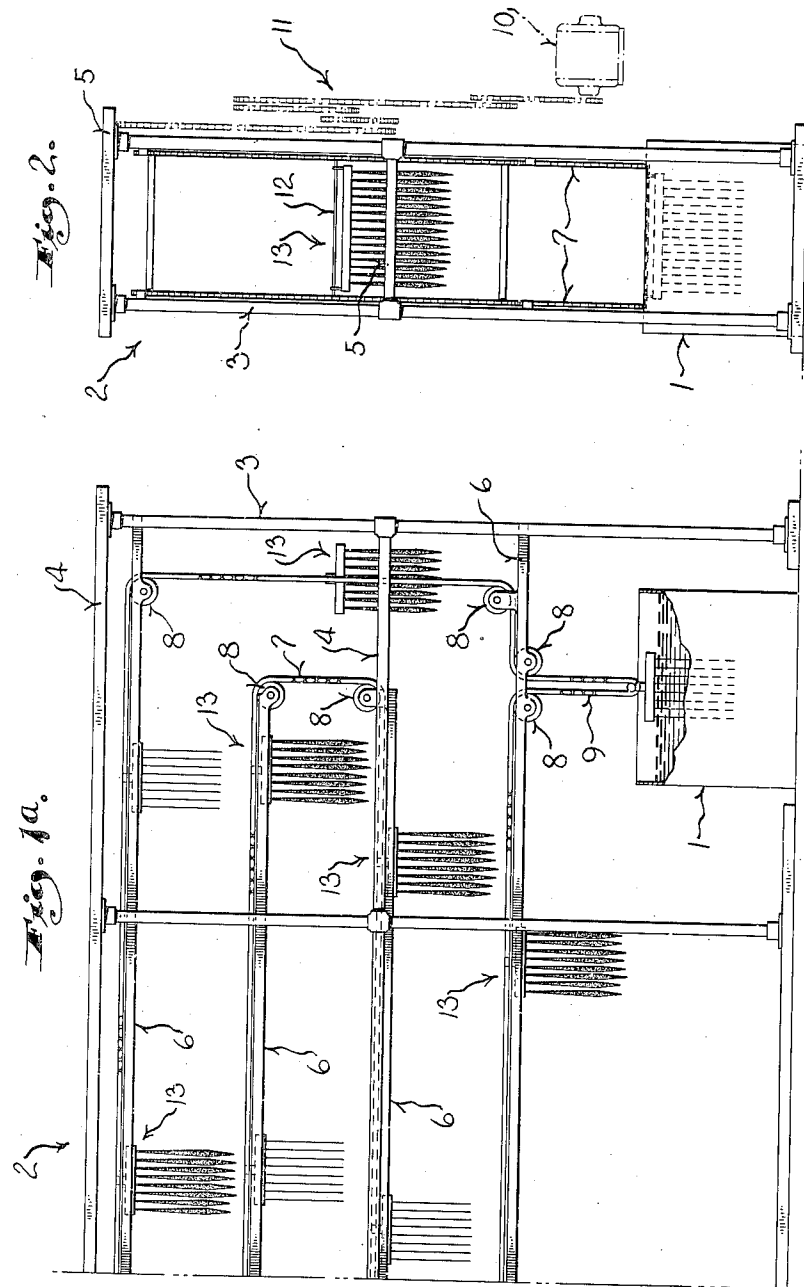
A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 2



Inventor.
Alfred E. Moore
By *Wm. Miller Jones*
attorney

Aug. 9, 1949.

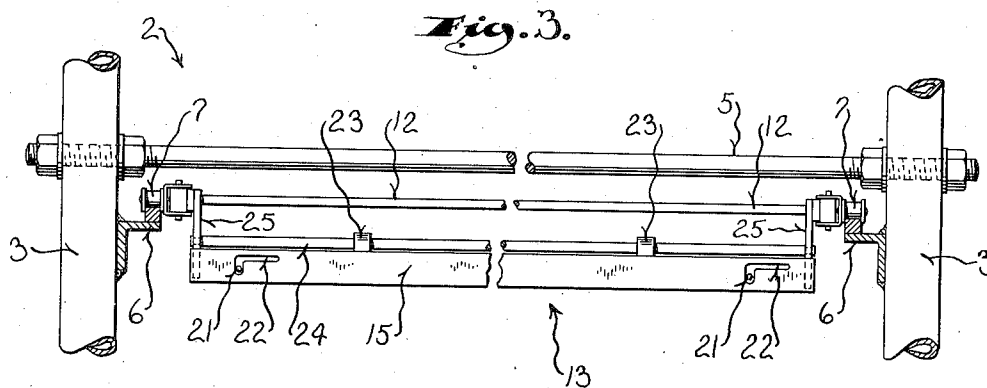
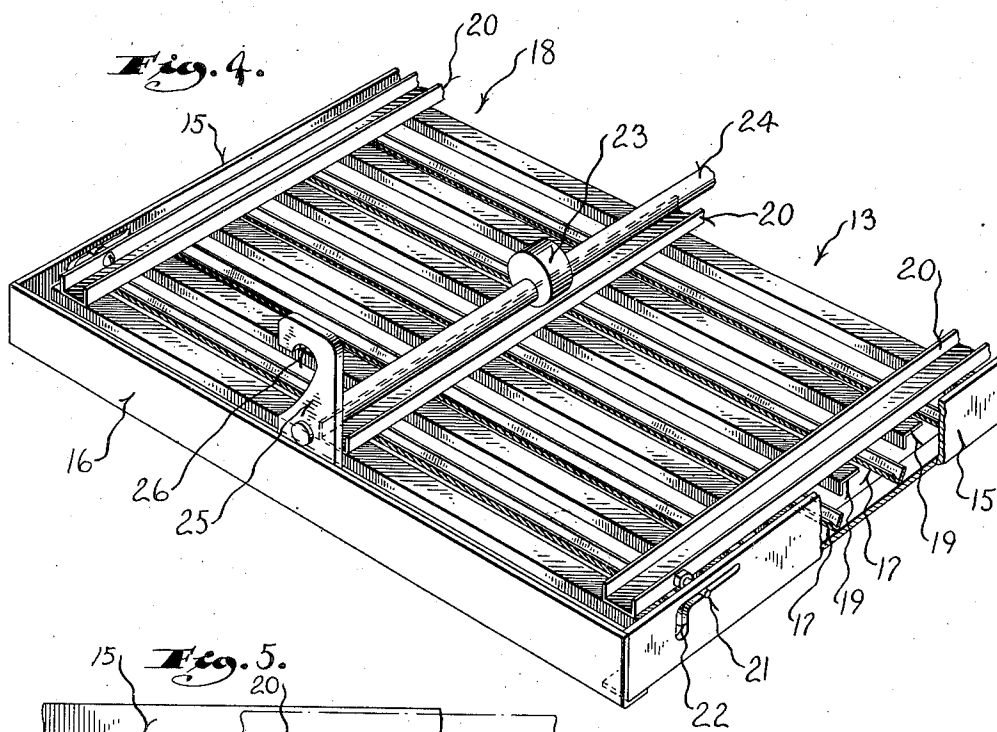
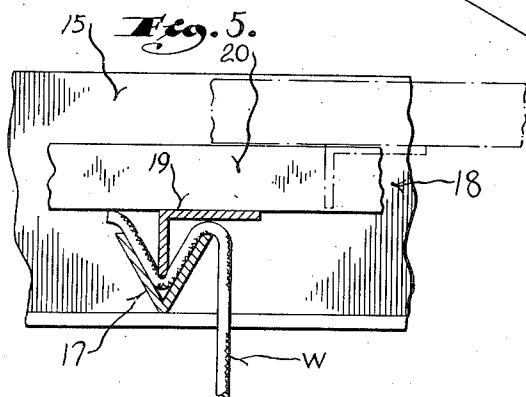
A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 3



Inventor
Alfred E. Moore
By *Irvington Jones*
Attorney

Aug. 9, 1949.

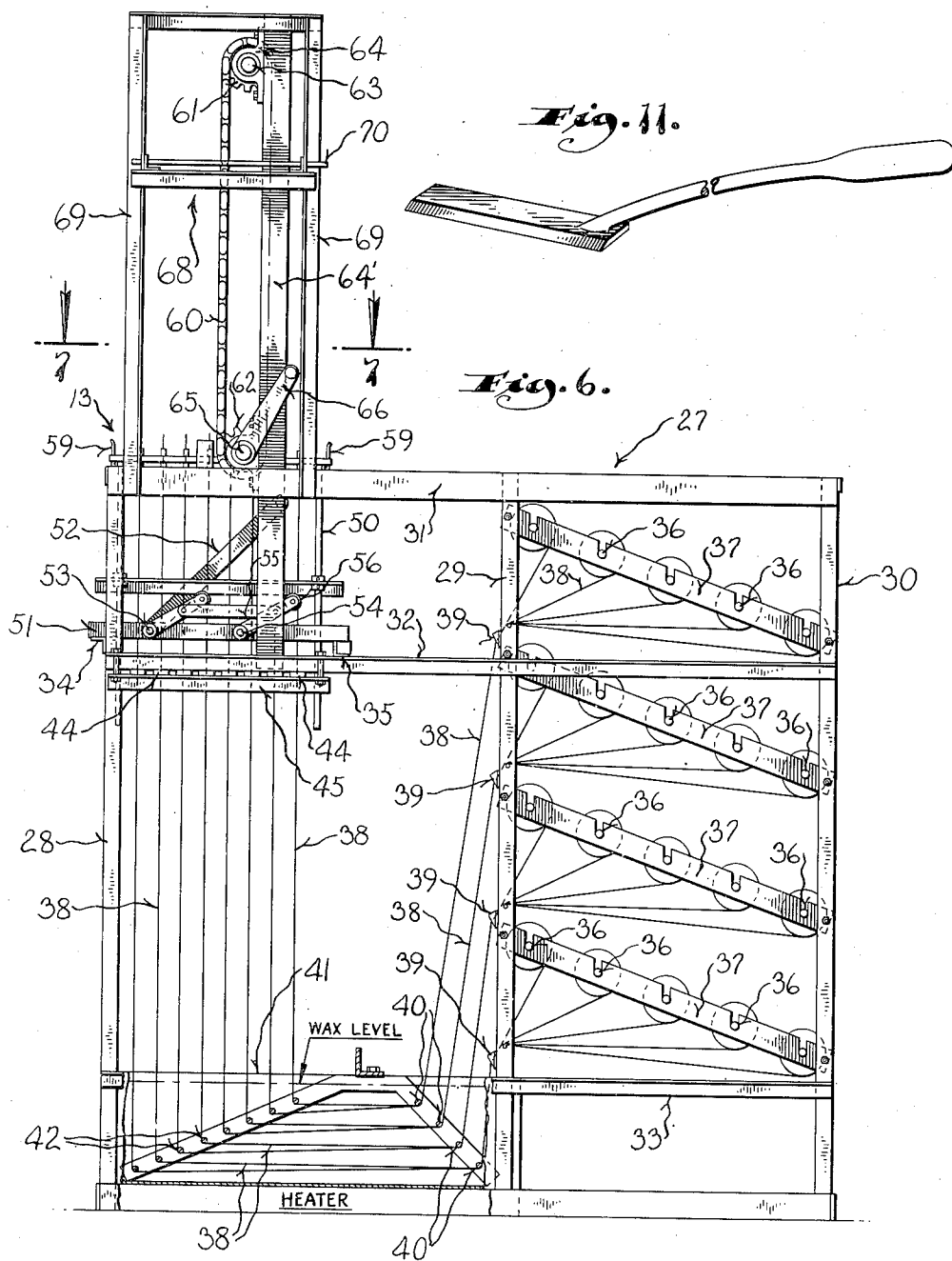
A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 4



Inventor
Alfred E. Moore
By Dea Milton Jones
Attorney

Aug. 9, 1949.

A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 5

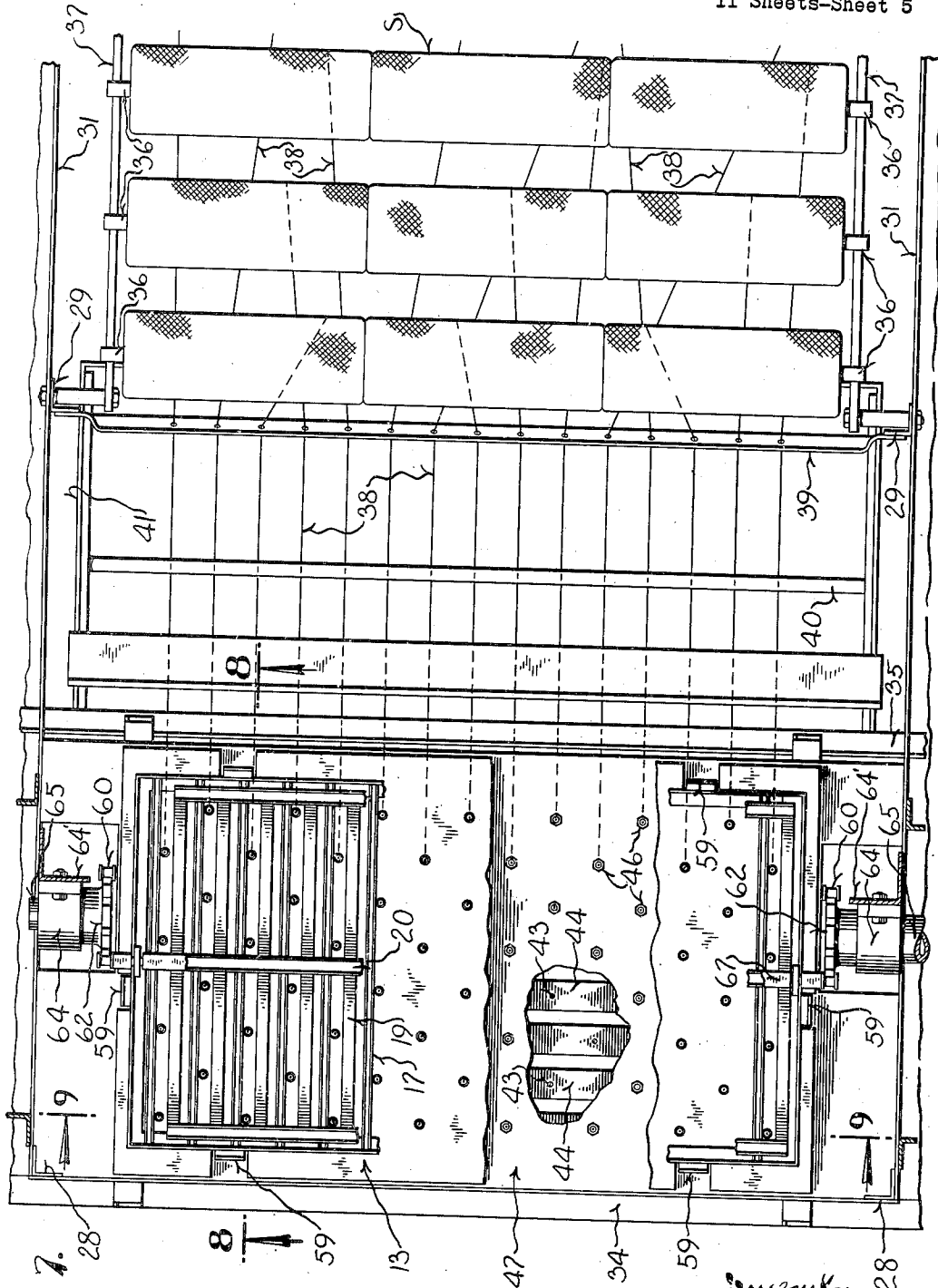


Fig. 7.

Inventor
Alfred E. Moore
D. Shuttles Jones
Attorney

Aug. 9, 1949.

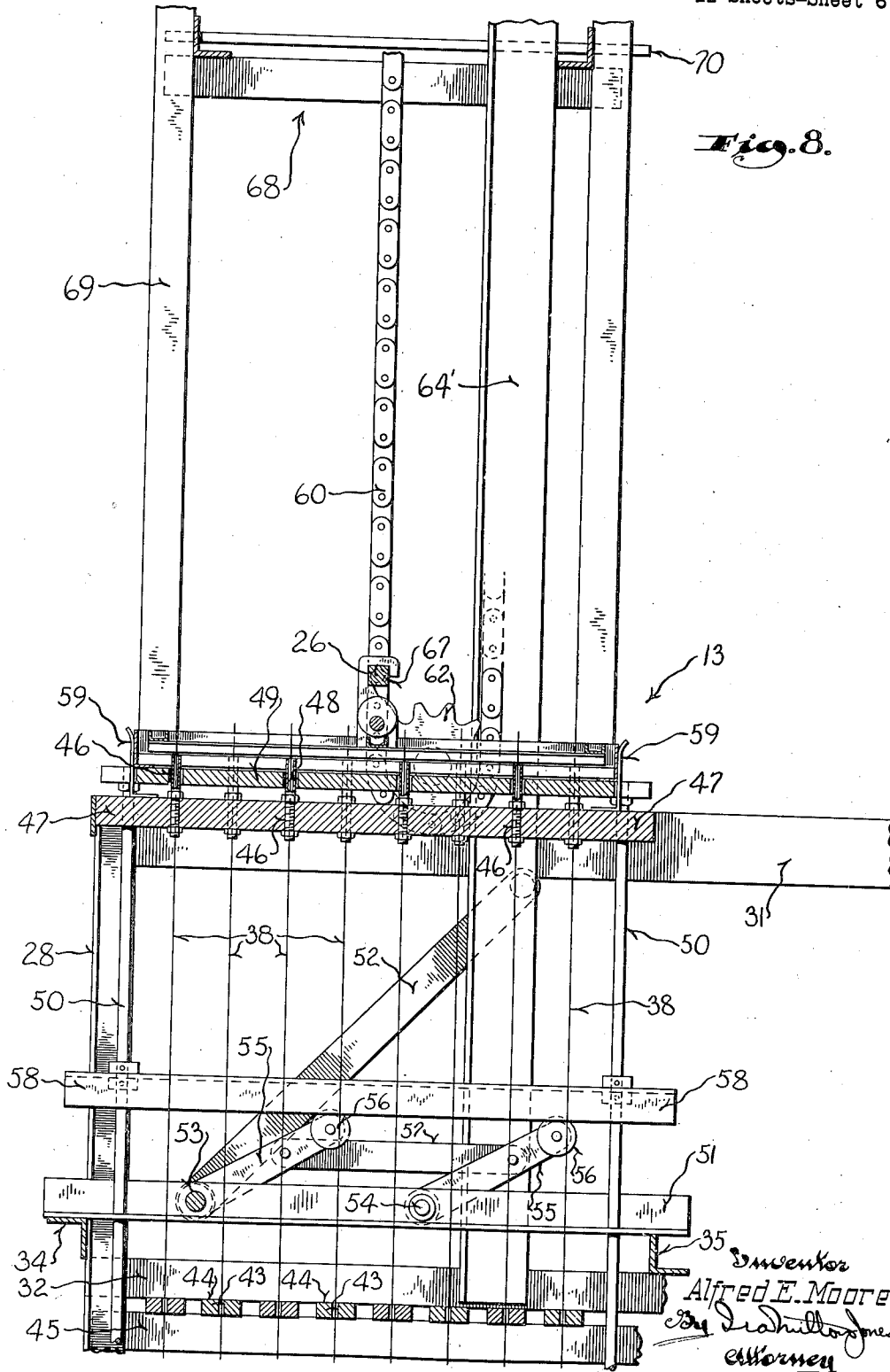
A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 6



Aug. 9, 1949.

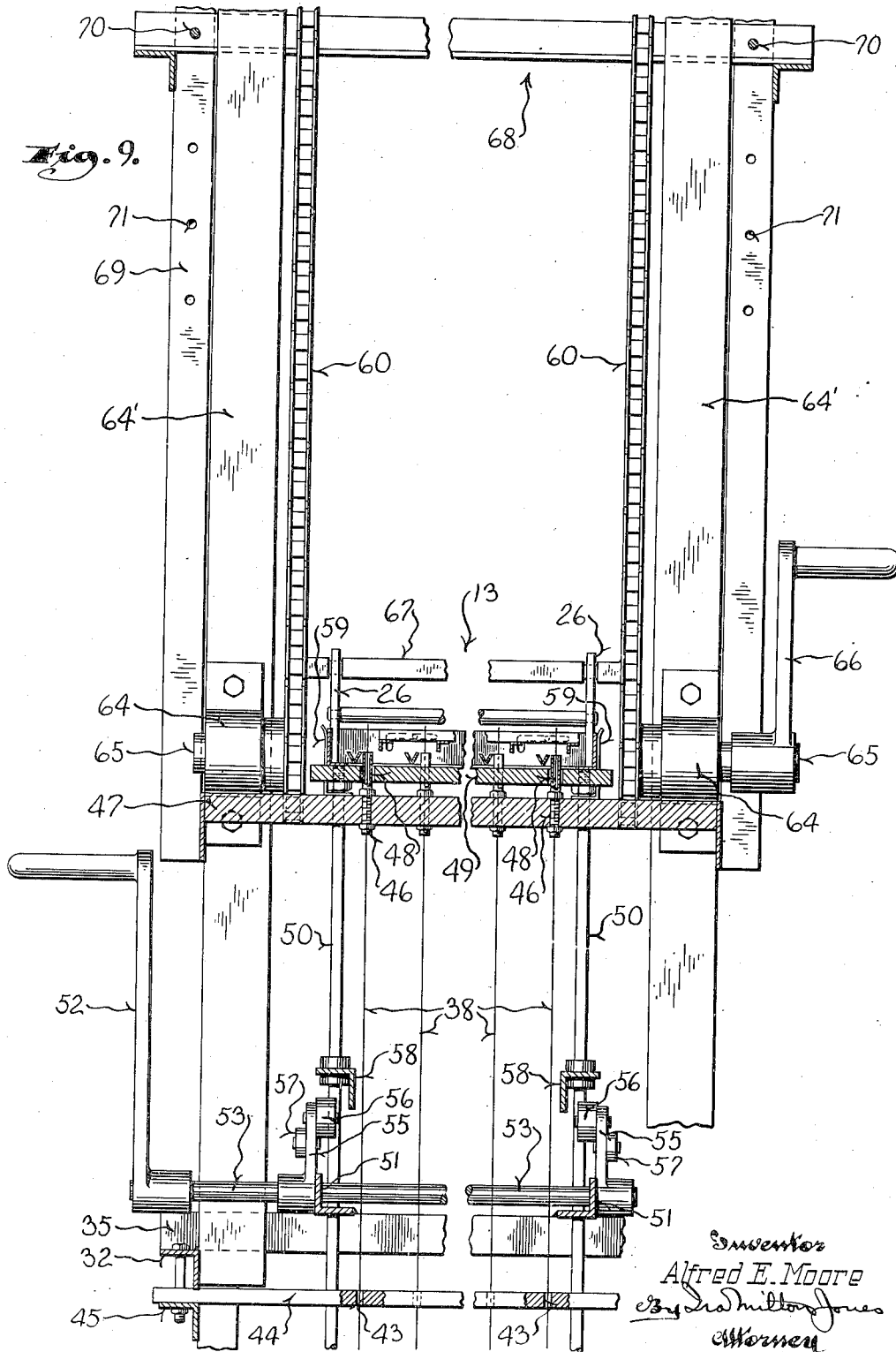
A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 7



Aug. 9, 1949.

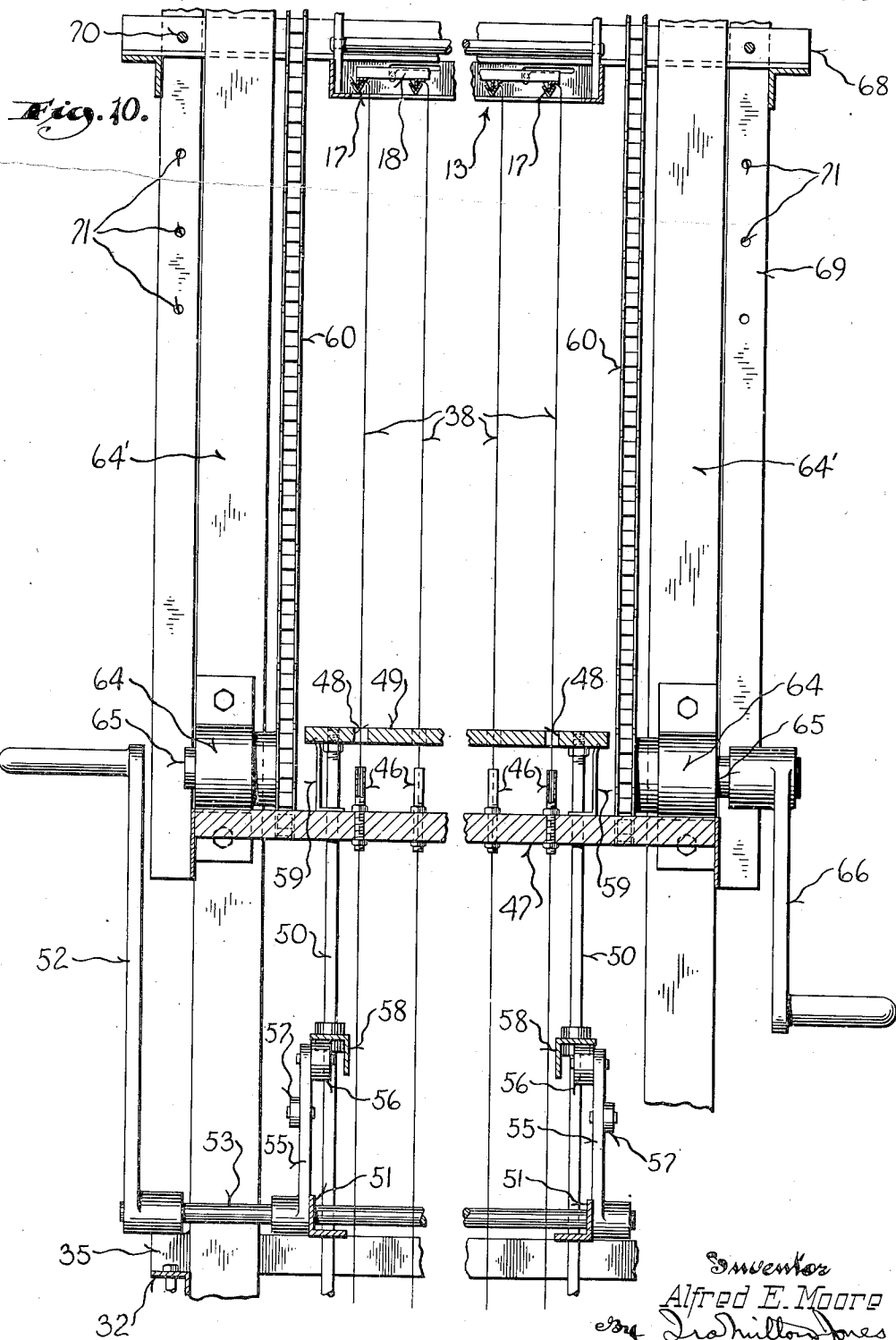
A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 8



Aug. 9, 1949.

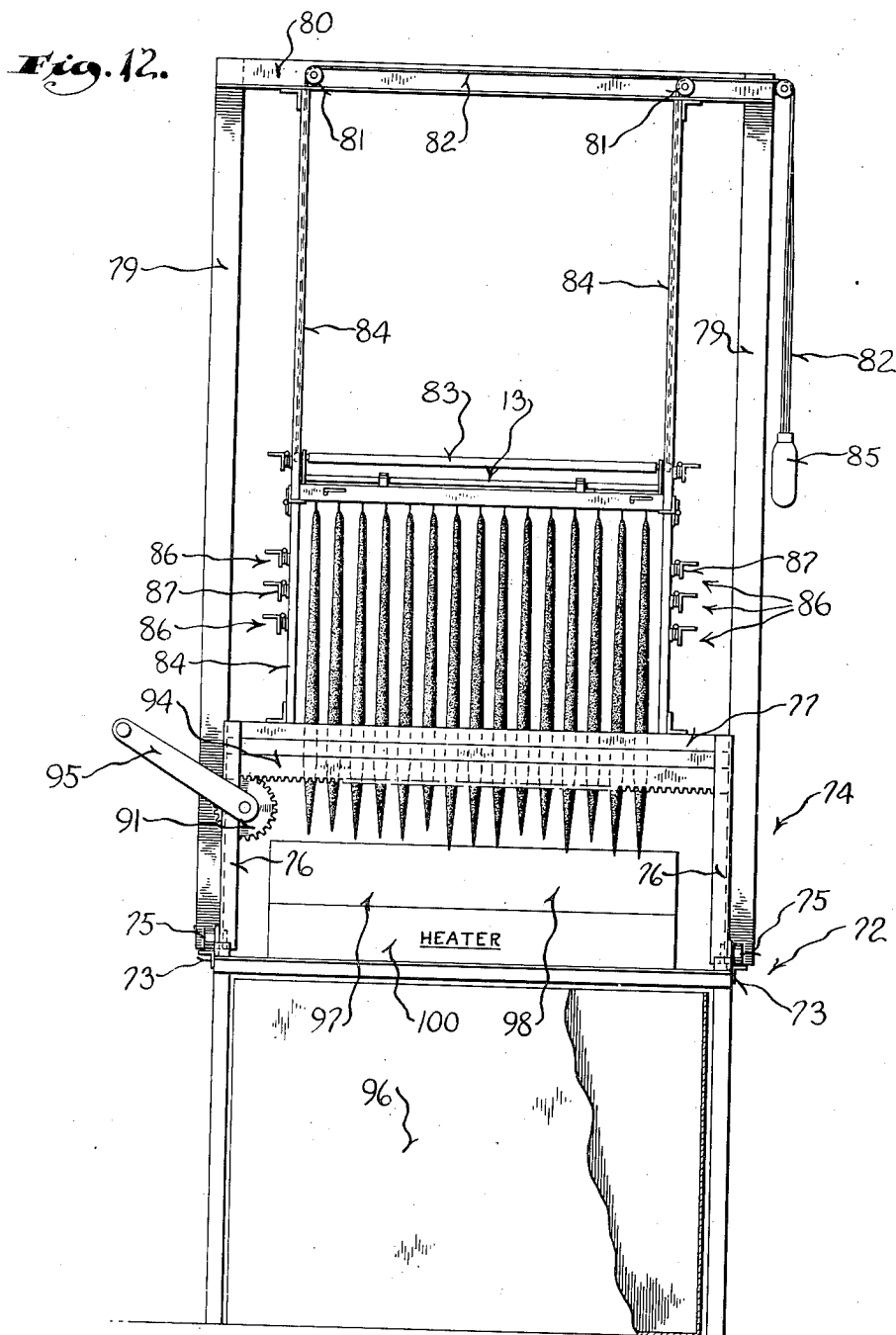
A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 9



Inventor
Alfred E. Moore
by Ira Miller Jones
Attorney

Aug. 9, 1949.

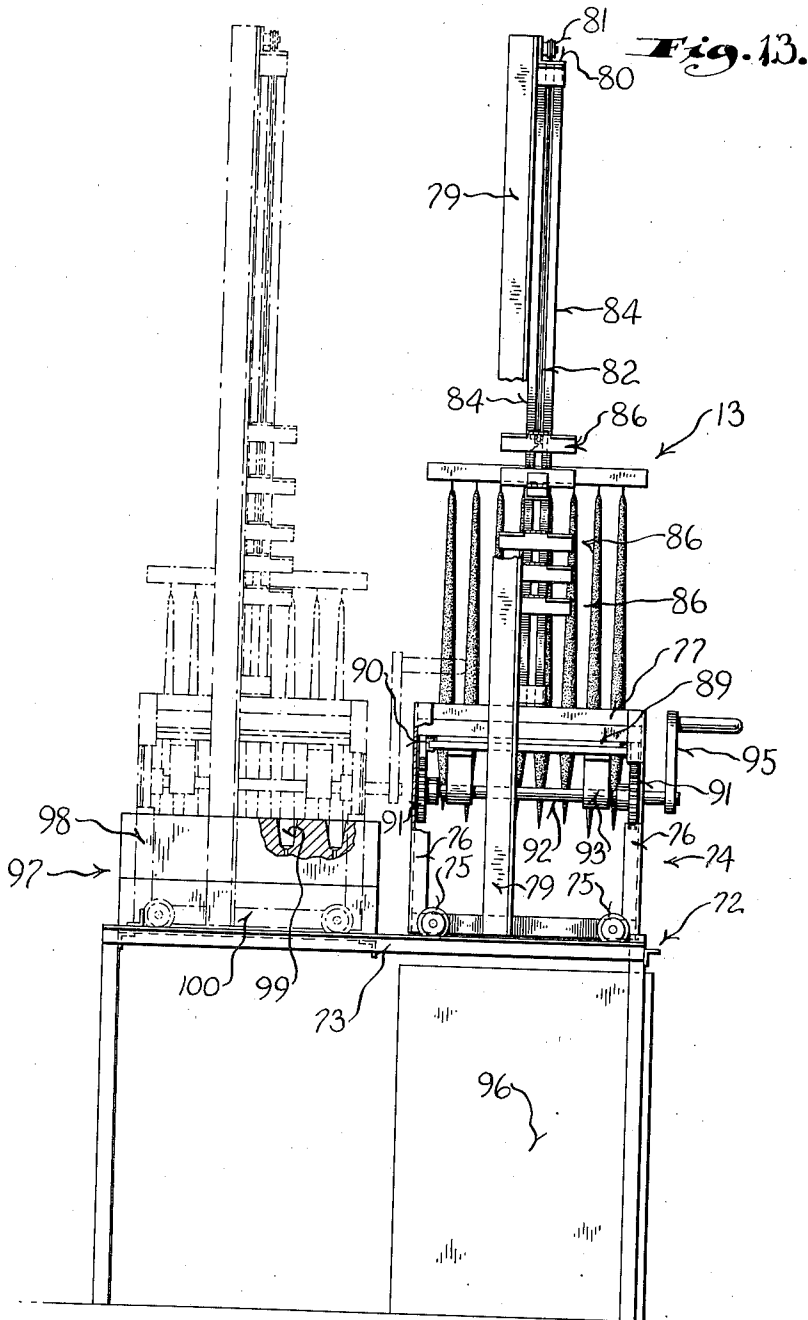
A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 10



Inventor
Alfred E. Moore
234 Graham Jones
Attorney

Aug. 9, 1949.

A. E. MOORE

2,478,202

METHOD AND APPARATUS FOR MAKING DIPPED CANDLES

Filed Jan. 20, 1947

11 Sheets-Sheet 11

Fig. 14.

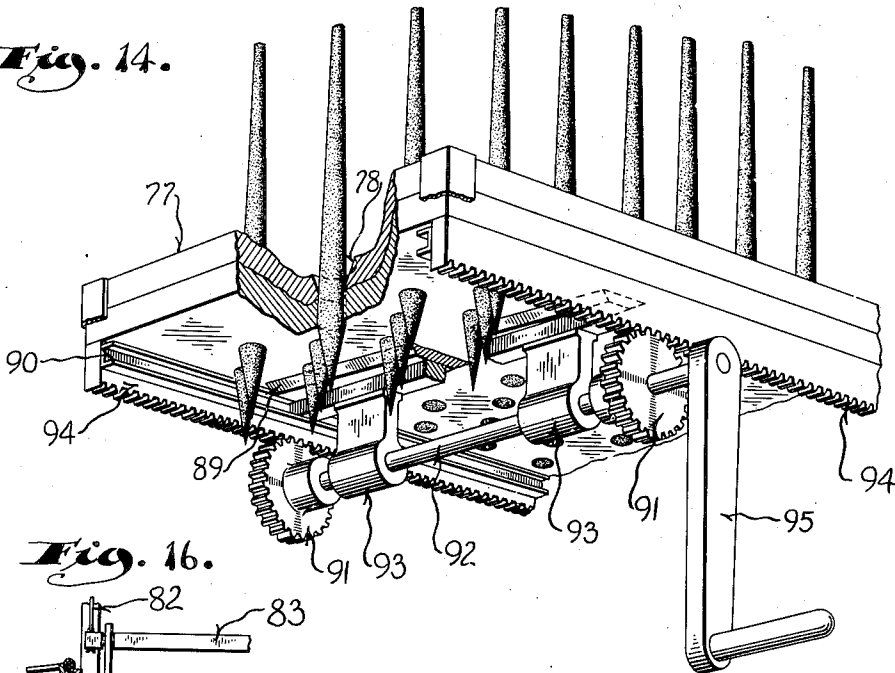


Fig. 16.

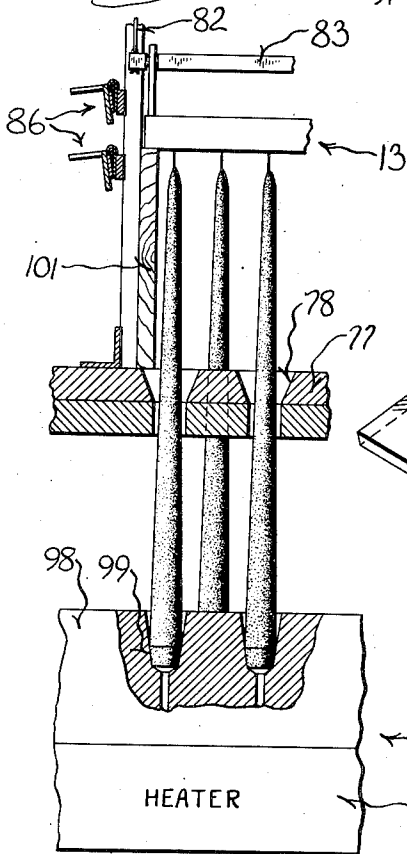
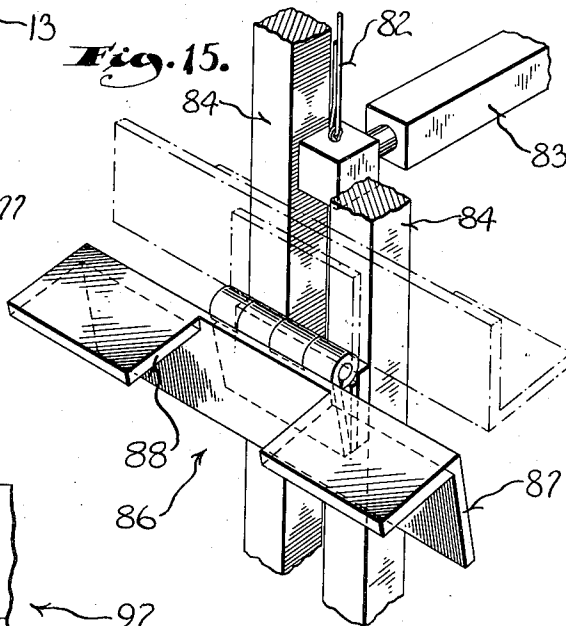


Fig. 15.



Inventor
Alfred E. Moore

By *S. H. Miller Jones*
Attorney

UNITED STATES PATENT OFFICE

2,478,202

METHOD AND APPARATUS FOR MAKING
DIPPED CANDLESAlfred E. Moore, Oshkosh, Wis.; Franklin Moore
administrator of said Alfred E. Moore, deceased

Application January 20, 1947, Serial No. 723,055

15 Claims. (Cl. 18—27)

1

This invention relates to the manufacture of candles and refers particularly to the production of candles by the so called hand-dipped method. Candles made in this manner possess a more pleasing appearance than molded candles and are generally considered a better product. As the name implies, a hand dipped candle is one formed by dipping a wick into a bath of molten wax or paraffin, allowing the coating accumulated on the wick to cool, and repeatedly alternately dipping and cooling the gradually formed candle until the desired body and diameter has been attained.

Heretofore the manufacture of such candles has been a slow hand operation. The present invention has as an object to provide an improved and considerably cheaper method of making dipped candles which, though it employs machines or mechanical apparatus nevertheless produces candles having the authentic hand-dipped appearance.

It is also an object of this invention to provide a novel apparatus to facilitate the practice of the improved method of this invention.

More specifically it is an object of this invention to provide an apparatus in the nature of an endless conveyor for repeatedly alternately dipping groups of wicks and partially formed candles into a bath of molten wax or paraffin and carrying the same around a defined path to cool and harden the coating gradually built upon the wicks.

Another object of this invention is to provide a frame or rack to which a large number of wicks may be quickly and easily attached and by which the wicks are attached to the conveyor device to be repeatedly dipped into the bath of molten wax or paraffin.

Another object of this invention is to provide a machine for efficiently and quickly attaching a large number of wicks to the carrying frames or racks. In this connection, it is a further object of this invention to provide a machine for simultaneously attaching a large number for wicks to a carrying frame or rack after being pre-coated with wax or paraffin so that the wicks depending therefrom will be stiff to more readily enter the bath of molten wax or paraffin upon initial dipping.

Another object of this invention is to provide a novel device for severing the lower tapered ends of the finished candles and shaping the butt ends thereof.

With the above and other objects in view, which will appear as the description proceeds, this in-

2

vention resides in the novel construction, combination and arrangement of parts and in the novel method and procedure substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed in accordance with the best mode so far devised for the practical application of the principles thereof, and in which:

Figures 1 and 1a together constitute a side elevational view of the conveyor-like apparatus by means of which groups of wicks and partially finished candles are repeatedly alternately dipped into a bath of molten wax or paraffin and carried around a defined path to cool the same between dippings, said views being somewhat diagrammatic;

Figure 2 is an end view of the conveyor structure shown in Figures 1 and 1a;

Figure 3 is a cross-sectional view on an enlarged scale taken through one of the runs of the conveyor structure on the plane of the line 3—3 in Figure 1, said view showing the manner in which the individual wick and candle carrying frames or racks are connected to the conveyor;

Figure 4 is a perspective view showing a portion of one of the wick and candle carrying frames or racks;

Figure 5 is detail sectional view taken through a portion of the frame or rack and illustrating the manner in which the wicks are held in place thereon;

Figure 6 is a view in side elevation of the machine for attaching the wicks to the individual frames or racks;

Figure 7 is a horizontal sectional view through Figure 6 on the plane of the line 7—7 with part of a wick and candle carrying frame or rack in position thereon and with portions of the wicking machine broken away to illustrate structural details;

Figure 8 is a vertical sectional view through that portion of the wicking machine which accommodates the wick and candle carrying frame or rack showing a frame or rack in position to receive the ends of the wicks, said view being taken on the plane of line 8—8 of Figure 7;

Figure 9 is a vertical sectional view through the wicking machine taken from the front on the plane of the line 9—9 in Figure 7, said view showing a wick and candle receiving frame or rack

3

in position and open to receive the wicks, and having the medial portion of the structure broken away to enable the two sides of the machine to be illustrated;

Figure 10 is a view similar to Figure 9 but showing the frame or rack elevated to a predetermined height to draw lengths of wick-forming strand material from the spools and also showing the guide board raised preparatory to severing the wicks;

Figure 11 is a perspective view of a knife which may be used in severing the wicks by sliding the same across the top of the guide board shown in Figure 10;

Figure 12 is a front view of the machine for severing the lower tapered ends of the finished candles and subsequently shaping the butt ends thereof;

Figure 13 is a side view of the machine shown in Figure 12;

Figure 14 is a detail perspective view showing the manner in which the lower tapered ends of the finished candles are cut off;

Figure 15 is a detail perspective view showing the adjustable stops, the selection of which determines the length of the candles; and

Figure 16 is a detail sectional view illustrating the manner in which the butt ends of the candles are shaped.

Referring now more particularly to the accompanying drawings in which like numerals indicate like parts throughout the several views, the numeral 1 designates a tank adapted to hold a bath of molten wax or paraffin and into which the wicks of partially formed candles are repeatedly and successively dipped by a conveyor structure indicated generally by the numeral 2. The conveyor structure is mounted on a suitable frame which may be formed of tubing as shown.

This frame has uprights 3 connected by side rails 4 and cross bars 5. The cross bars 5 rigidly tie together the two sides of the frame as shown in Figure 3. Tracks 6 are mounted on the uprights to support horizontal stretches of endless roller type conveyor chains 7. These chains, one at each side of the frame, are trained over suitably spaced sprocket wheels or guide rollers 8 so that the chains travel in unison around a relatively long path. This path may take any pattern except that over the tank the chains have an abrupt downward and upward run 9.

Any suitable means for driving the chain conveyor may be employed as for instance, an electric motor 10 drivingly connected with the several horizontal runs of the chain conveyor through a sprocket chain transmission indicated generally by the numeral 11.

As shown in Figure 3, the conveyor chains at opposite sides of the frame are connected by cross bars 12. These cross bars are arranged at spaced intervals along the conveyor and each is adapted to have a wick or candle carrying frame 13 attached thereto. The wicks and partially finished candles carried by these frames or racks hang therefrom in spaced apart relationship to be repeatedly dipped into the bath of molten wax or paraffin as the frames or racks travel down and up the vertical run 9 of the conveyor. Between dippings the freshly accumulated wax or paraffin coating is cooled and set as the frame or rack is carried around the defined path of the conveyor chain.

It is, of course, to be understood that the conveyor chain travels at a rate of speed so chosen with respect to its length that adequate cooling

4

of the freshly applied coating is accomplished. Likewise the speed of travel of the conveyor chain is such that freshly loaded frames or racks may be manually applied to the cross bars 12 as they travel along a horizontal stretch 14 at the end of the conveyor unit opposite the tank 1, while frames or racks carrying finished candles may be removed at this point. Mechanical loading and unloading devices might be employed for this purpose, but it has been found satisfactory to manually apply and remove the frames or racks.

Each frame or rack 13 consists of two side rails 15 preferably of angle iron connected at their ends by rails 16. The side and end rails 15 and 16 define a rectangular open frame, and extending transversely across this open frame are cross bars 17. The bars 17 are V-shaped in cross-section, and are welded or otherwise secured to the horizontal flanges of the side rails 15.

A latching or locking structure indicated generally by the numeral 18 cooperates with the cross bars 17 to hold or grasp the wicks. This latching or locking structure consists of a plurality of parallel spaced transverse angle members 19 welded or otherwise secured to three longitudinal rails 20. The spacing between adjacent cross bars 19 corresponds to the spacing of the V-shaped cross bars 17. Consequently, the latching or locking structure 18 may occupy a position in which the vertical flanges of its cross bars 19 align with and enter the troughs of the V-shaped cross bars 17. In such a position, the vertical flanges of the cross bars 19 can clamp wicks W to the frame or rack.

This operative wick clamping position is defined by the engagement of guide pins 21 projecting from the outer most longitudinal rails 20, in the vertical portions of right angular guide slots 22 in the upright flanges of the side rails 15. Upon lifting the latching and locking structure and shifting the same horizontally as defined by the entry of the guide pins into the horizontal portions of the slots 22 all of the locking bars 19 will be lifted out of and held clear of the V-shaped cross bars 17. This is the position the latching or locking structure occupies when the frames or racks are in position in the wicking machine preparatory to having wicks attached thereto (Figure 6 to 10 inclusive).

When the latching or locking structure 18 is shifted to its operative position (shown in full lines in Figure 5) it may be secured in that position by eccentrics 23 mounted on a shaft 24 directly over the center rail 20. The shaft 24 is journaled in projections 25 fixed to the end rails 16, and when this shaft is turned to bring the eccentrics down onto the center rail 20, upward displacement of the latching and locking structure 18 is precluded.

The projections 25 have hooks 26 at their upper ends to provide means by which the frames or racks are removably attached to the conveyor rods 12.

The attachment of the wick forming strands to the carrying frames or racks 13 is done on a so-called wicking machine shown in Figures 7 to 10 inclusive. This wicking machine comprises a frame 27 including uprights 28, 29 and 30, side rails 31, 32 and 33 and suitable cross members including angle irons 34 and 35, the former connecting the uprights 28 directly above the side rails 32 and the latter connecting and resting on the side rails 32.

The space defined between the uprights 29 and 30 constitutes a spool rack where a number

5

of spools of wick forming strand material are mounted on spindles 36 resting on inclined supports 37. In the present instance, there are four tiers of spools with fifteen (15) spools in each tier. The strands 38 coming from the individual spools of each tier pass through eyelets in guide bars 39 extending across and fixed to the uprights 29. One such guide bar is provided for each tier and the eyelets in the guide bars are so spaced along the length thereof as to effect equal spacing between the strands 38 passing therethrough.

From the eyelets in the guide bars 39, the strands extend down to pass under horizontal guide bars 40 suitably supported at their ends within a tank 41 adapted to contain a bath of molten wax or paraffin. One such guide bar 40 is provided for each tier of spools.

Forwardly of the guide bars 40, but also within the tank 41 is a second bank of guide bars 42. There are twice as many bars 42 as there are guide bars 40, and the strands extending forwardly from the bars 40 pass alternately under the two bars 42 opposite each bar 40. Thus, for instance, the strands extending from the lowermost bar 40 pass alternately under the lowermost and next adjacent bar 42 so that where there were four rows of downwardly moving strands entering the molten wax bath 41, there are eight rows of strands leaving the same, with eight strands in the first row, seven in the second, eight in the third, seven in the fourth and so on.

The upwardly extending strands leaving the wax bath are threaded through eyelets 43 in guide bars 44. The ends of these guide bars 44 are clamped to the underside of the side rails 32 by clamping members 45. Passing through the eyelets 43, the strands extend through tubular guideways 46 secured in a stationary horizontal plate 47. The plate 47 is suitably secured to the supporting structure between the side rails 31 and the tubular guideways 46 project from the top of the plate 47 a distance sufficient to protrude through holes 48 in a movable horizontal plate 49.

The plate 49 is secured to the upper ends of vertical guide bars 50 which in turn extend slidably through the fixed plate 47 and through the horizontal flanges of angle irons 51 stationarily secured to the supporting structure directly above the cross members 34 and 35. The rods 50 thus guide the plate 49 for up and down motion between a lowered position shown in Figures 6, 7, and 9, and a raised position shown in Figure 10. Such up and down motion is imparted to the plate 49 by actuation of a crank handle 52.

The handle 52 is secured to a cross shaft 53 journaled in the upright flanges of the angle irons 51. A second cross shaft 54 also journaled in the upright flanges of the angle irons 51 extends parallel to the shaft 53 but rearwardly thereof. The shafts 53 and 54 have rocker arms 55 fixed thereto, the ends of which carry rollers 56. Links 57 connect the rocker arms 55 and thus produce a parallelogram linkage adapted to be extended and collapsed by actuation of the handle 52. The rollers 56 are positioned to engage under the horizontal flanges of angle irons 58 secured to the guide rods 50 as shown in Figure 10. Thus upon extension of the parallelogram linkage, the rollers 56 engage under the horizontal flanges of the angle irons 58 to lift the same, and consequently the plate 49.

In its elevated position the plate 49 is above the tubular guideways 46 whereas in the lowermost position of the plate 49, the tubular guide-

6

ways 46 protrude through the holes 48 in the plate 49. The extent to which the tubular guideways 46 protrude from the top of the plate 49 (in its lowermost position) is such that the tops of the V-shaped cross bars 17 of a carrying frame or rack 13 resting on the plate 49 are substantially flush with the tops of the tubular guideways (see Figure 9).

Guide fingers 59 project from the stationary plate 47 to properly locate a frame or rack 13 for attachment of the projecting ends of the strands 38 to the cross bars 17. It should be noted that the strands projecting up from the wax bath and particularly the ends thereof protruding through the guideways 46 are stiffened by the accumulation of wax thereon, and that the fit of the strands in the guideways 46, in view of this accumulation of wax, is sufficiently close to hold the strands from dropping down.

A frame or rack 13 in position to have the protruding ends of the wick forming strands attached thereto has one of its cross bars 17 located alongside each longitudinal row of tubular guideways 46 with the projecting ends of the wick forming strands located between the cross bars 17 and their cooperating locking bars 19. Thus with a frame or rack in position shifting of the locking or latching structure to dispose the bars 19 in the troughs of the cross bars 17 simultaneously clamps the ends of all of the wick forming strands to the frame or rack.

While the individual carrying frames or racks might be manually set onto the plate 49 to have the wick-forming strands attached thereto, an elevator device is provided to facilitate this operation and also to enable drawing the wick-forming strands up through the guideways 46. This elevator device consists of two endless conveyor chains 60 trained over upper and lower sprockets 61 and 62. The upper sprockets are secured to a cross shaft 63 journaled in bearings 64 fixed to uprights 64'. The lower sprockets are mounted on stub shafts 65 journaled in similar bearings 64 also secured to the uprights 64'. The stub shaft 65 at that side of the machine opposite the handle 52 has a crank handle 66 fixed thereto to provide means for actuating the elevator.

At spaced intervals the sprocket chains 60 are connected by cross bars 67 which, like the cross bars 12 of the conveyor device 2, are adapted to be engaged by the hooks 26 of the carrying frames or racks to support the frames or racks from the cross bars. Hence upon attachment of a frame or rack to a cross bar 67 and actuation of the crank handle 66, the frame or rack so supported can be lowered onto the plate 49 preparatory to having the ends of the wick-forming strands attached to its cross bars 17.

After the ends of the wick forming strands are thus attached to the frame or rack, the crank handle 66 may be actuated in the opposite direction to raise the frame or rack. During the raising of the frame or rack another length of strand material is unwound from the spools and drawn through the wax bath while the wax coated vertically extending strands now depending from the frame or rack are pulled up through the guideways 46.

The extent to which the frame or rack is elevated determines the length of the wicks for the candles to be formed. Hence an adjustable stop is provided to limit elevation of the frame or rack at a desired point. This adjustable stop consists of a rectangular frame 68, guided for

movement up and down within an upright guide structure 69 and adapted to be secured in any one of a number of different positions of elevation by cross pins 70 removably received in holes 71 in the uprights of the guide structure 69. Inasmuch as the frame 68 occupies a horizontal plane when in position, it follows that the frame or rack 13 upon being brought up squarely against the same, as in Figure 10, will likewise be in a horizontal plane to assure that all of the wicks will have the same length.

With the frame or rack held up against the stop frame 68 and upon elevation of the plate 49 by means of the crank handle 52, all of the strands may be quickly severed to the same length by means of a knife such as that shown in Figure 11 manipulated across the top of the plate 49.

The carrying frame or rack thus loaded with wicks is then removed from the wicking machine and carried to the main conveyor where it is attached to one of its cross bars 12. Lowering the plate 49 readies the wicking machine for the attachment of wick-forming strands to the next frame or rack 13.

As will be apparent, because the wicks which hang from the carrying frames are precoated with wax, their initial immersion in the bath 1 is more readily effected. Thus the operator merely hangs the freshly loaded carrying frame or rack on the conveyor 2 at its horizontal run 14 and from there the dipping of the wicks and partially formed candles is automatic.

When a frame or rack carrying finished candles arrives at the horizontal run 14 of the conveyor 2, it is lifted off and carried to a combination guillotining and shaping machine shown in Figures 12 to 16 inclusive. This machine comprises a supporting structure 72 which includes spaced horizontal rails or tracks 73 on which a carriage 74 is mounted by means of wheels 75. The carriage 74 includes four corner uprights 76 which together support a guide plate 77. This guide plate has holes 78 therethrough located to correspond to the relative spacing of the chandles hanging from a frame or rack 13 so that when such a loaded frame is properly positioned over the plate 77, the lower tapered ends of the finished candles may be caused to enter and pass down through the holes. To facilitate entry of the candles into the holes, the mouths of the holes are funnel-shaped.

To support a frame or rack in proper position over the plate 77, a supporting structure consisting of uprights 79 connected by a cross bar 80 is provided. The cross bar 80 has pulleys 81 mounted thereon over which cables 82 are trained. The ends of these cables are connected to a cross bar 83 similar to the cross bar 67 and adapted to have the hooks 26 of the carrying frames or racks engaged thereover. The extreme ends of the cross bar 83 are received between upright guides 84 extending from the plate 77 to the top cross bar 80. Hence the bar 83 is held against swaying backward and forward as the cables are raised and lowered by means of a handle 85 to which both cables are attached. Crosswise shifting of the rod 83 is prevented when a frame or rack 13 is suspended therefrom by the ends of the frame or rack engaging the inner faces of the guides 84. The guides 84 have stops 86 mounted thereon to support the carrying frame or rack at different distances above the plate 77. These stops hold the carrying frame or rack in parallelism with the plate 77.

As best shown in Figure 15, the stops 86 consist of short lengths of angle iron 87 hinged to the guides 84 with one flange thereof cut out as at 88. Thus when the angles 87 are flipped over to their operative positions shown in dotted lines in Figure 15, the cut out portions 88 accommodate the guides 84 and the then horizontally disposed flanges are in position to support a carrying frame or rack 13. Figure 12 shows two of the supports 86 in operative position supporting a carrying frame or rack with the lower tapered ends of the candles protruding through the guide plate 77.

A guillotine knife 89 is mounted to move across the underside of the guide plate 77 to successively sever the protruding lower ends of the candles. Guideways 90 at the underside of the plate 77 support the knife for movement back and forth, such motion being produced by means of pinions 91 fixed to a shaft 92 journaled in bearings 93 depending from the underside of the knife and meshing with stationary racks 94. A crank handle 95 provides means for rotating the pinions. If desired, the knife 89 may be double-edged so as to cut in both directions of movement.

The lower tapered ends severed from the candles drop into a tank or receptacle 96 over which the carriage 74 is positioned during the guillotining operation. After the ends of the candles have been thus guillotined, the carriage 74 is rolled back on the tracks 73 to a position over a butt forming or shaping unit 97. This unit 97 consists merely of a platen 98 provided with sockets 99, the upper ends of which are funnel-shaped to guide the lower severed ends of the candles into place, and the lower ends of which are formed to impart the desired shape to the candles. A suitable heater 100 is provided to keep the platen at the desired temperature.

Inasmuch as the candles must be lowered to enter the sockets 99 of the shaping platen, the cables 82 are first pulled up a slight distance to allow the adjustable supports 86 that had been used to be flipped out of the way permitting further descent of the carrying frame or rack. The extent to which the frame or rack is then lowered depends upon the length of the candle being made. Removable supporting blocks 101, one of which is positioned under each end of the carrying frame or rack as shown in Figure 16, support the frame or rack in proper position.

It is to be appreciated that a separate set of supporting blocks 101 is provided for each size of candle being made and that the heights of these blocks bear a correlative relationship to the locations of the stops 86.

It is to be understood that the terms "wax" and "paraffin" as used in the specification and claims covers any substance of which candles can be made by repeatedly dipping the wick into a bath of the molten substance.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art, that this invention provides a method and apparatus for making dipped candles more efficiently and economically than has been possible heretofore.

What I claim as my invention is:

1. The method of simultaneously making a large number of candles, which comprises: attaching the ends of a plurality of wick-forming strands wound on spools to a portable carrying frame with the strands spaced apart and passing through a bath of molten wax; moving the carrying frame in a direction to unwind the strands

from the spools and draw the strand through the wax bath; severing all of the wax coated strands at a predetermined distance from the frame while holding the frame stationary to thus provide a plurality of relatively stiff wicks; transporting the carrying frame with the wicks depending therefrom to a position over a molten wax bath; and repeatedly lowering the frame to dip the wicks into the molten wax bath, raising the frame to pull the wicks out of the molten wax bath, and cooling the wax accumulated on the wicks, until sufficient wax is deposited on the wicks to form the candles.

2. Apparatus for simultaneously attaching a plurality of wick forming strands to a carrying frame of a candle making machine and simultaneously precoating the strands with wax, comprising: a pan adapted to hold a bath of molten wax; a supporting structure having a portion above said pan; means on the supporting structure for supporting a plurality of spools of wick forming strand material; guides on the supporting structure for guiding the strands from the spools, through the bath of molten wax and up from said bath; a horizontal plate mounted on the supporting structure above the pan, said plate having spaced holes to receive and hold the waxed strands against lateral displacement; a movable support on the supporting structure for supporting a carrying frame above said plate to enable attachment of the waxed strands to the carrying frame at positions determined by the spacing of the holes in said plate; and means for elevating the movable support to raise a frame to which the waxed strands have been attached to thus draw the unwaxed strands through the bath of molten wax and the waxed strands through the holes in said plate, so that by predetermining the extent to which the carrying frame is elevated and severing the waxed strands at equal distances from the frame the strands depending therefrom become pre-coated wicks of uniform length adapted for simultaneous dipping into a candle forming bath.

3. Apparatus for simultaneously attaching a plurality of wick forming strands to a carrying frame of a candle making machine and simultaneously precoating the strands with wax, comprising: a pan adapted to hold a bath of molten wax; a supporting structure having a portion above said pan; means on the supporting structure for supporting a plurality of spools of wick forming strand material; guides on the supporting structure for guiding the strands from the spools, through the bath of molten wax and up from said bath; a horizontal plate mounted on the supporting structure above the pan, said plate having spaced holes to receive and hold the waxed strands against lateral displacement; a movable support on the supporting structure for supporting a carrying frame above said plate to enable attachment of the waxed strands to the carrying frame at positions determined by the spacing of the holes in said plate; and means for elevating the movable support to raise a frame to which the waxed strands have been attached to thus draw the unwaxed strands through the bath of molten wax and the waxed strands through the holes in said plate; and adjustable stop means on the supporting structure for limiting the elevation of the carrying frame, with said frame parallel to the plate so that by severing all of the waxed strands at the same distance with respect to the plate all of the waxed strands depending

from the carrying frame will be of substantially the same length.

4. Apparatus for simultaneously attaching a plurality of wick forming strands to a carrying frame of a candle making machine and simultaneously precoating the strands with wax, comprising: a pan adapted to hold a bath of molten wax; a supporting structure having a portion above said pan; means on the supporting structure for supporting a plurality of spools of wick forming strand material; guides on the supporting structure for guiding the strands from the spools, through the bath of molten wax and up from said bath; a horizontal plate, said plate having holes to receive the waxed strands; means mounting the plate from the supporting structure for limited flatwise up and down motion; means closely adjacent to the underside of the plate for holding the waxed strands against a tendency to move endwise as the plate is raised and lowered; elevatable means for supporting a carrying frame above the plate to enable attachment of the ends of the waxed strands projecting from the holes in the plate to said carrying frame; means for elevating said frame support to a predetermined height above the plate; and means for elevating and lowering the plate, so that severance of the waxed strands on the plane of the top of the plate after the carrying frame has been elevated and the plate raised, followed by lowering of the plate provides the carrying frame with prewaxed wicks of substantially uniform length and projects the ends of waxed strands above the plate for attachment to another carrying frame.

5. A device of the character described comprising: a supporting structure; a pan in the bottom of the supporting structure adapted to hold a bath of molten wax; a spool rack on the supporting structure adapted to hold a plurality of spools of wick forming strand material; means on the supporting structure providing a plurality of spaced guideways for strand material above the pan; other guide means on the supporting structure for guiding the passage of strand material from the spools, through the bath of molten wax in the pan and to said spaced guideways; said spaced guideways holding the ends of the strand material, coated with wax as a result of being pulled through the bath of molten wax, against lateral displacement so as to facilitate attachment of the ends of the coated strand material to a carrying frame; elevation of the carrying frame with the strand material attached thereto pulling the uncoated strand material through the wax bath and pulling the coated strand material through said spaced guideways to expose lengths of said coated strand material above the spaced guideways, so that the severance of the coated strands at a predetermined distance above the spaced guideways provides the carrying frame with depending pre-coated candle wicks of substantially uniform length; a horizontal guide plate extending across the spaced guideways, said plate having holes aligned with the guideways through which the strand material passes, and providing a guide for the severance of the strands; and means for effecting relative vertical motion between the guide plate and the strands so that upon severance of the strands the freshly cut end portions thereof may be caused to project above the plate.

6. A device of the character described, comprising: a supporting structure; a pan in the bottom of the supporting structure adapted to

11

hold a bath of molten wax; a spool rack on the supporting structure adapted to hold a plurality of spools of wick forming strand material; a horizontal plate fixed on the supporting structure above the pan, said plate having spaced tubular guideways extending therethrough; a movable plate having holes to align with the tubular guideways when said movable plate occupies a position disposed flatwise directly above the fixed plate; means mounting the movable plate on the supporting structure for limited flatwise up and down motion sufficient to dispose the top of the movable plate above the tops of the tubular guideways; other strand guiding means on the supporting structure for guiding the strand material from the spools through the bath of molten wax and to said tubular guideways in the fixed plate; and means for raising and lowering the movable plate flatwise between its upper and lower limits, the top surface of the movable plate providing a guide for the severance of coated strands pulled through the tubular guideways so that the freshly cut ends of the strands, stiff from being coated with wax, project a uniform distance above the top of the movable plate after severance of the strands and lowering of the movable plate to its lowermost position.

7. A device of the character described, comprising: a supporting structure; a pan in the bottom of the supporting structure adapted to hold a bath of molten wax; a spool rack on the supporting structure adapted to hold a plurality of spools of wick forming strand material; a horizontal plate fixed on the supporting structure above the pan, said plate having spaced tubular guideways extending therethrough; a movable plate having holes to align with the tubular guideways when said movable plate occupies a position disposed flatwise directly above the fixed plate; means mounting the movable plate on the supporting structure for limited flatwise up and down motion sufficient to dispose the top of the movable plate above the tops of the tubular guideways; other strand guiding means on the supporting structure for guiding the strand material from the spools through the bath of molten wax and to said tubular guideways in the fixed plate; a pair of opposite endless sprocket chains running over vertically spaced sprockets at each side of the supporting structure, the upper sprockets being fixed to a common shaft, and said chains extending up from the fixed plate; a plurality of carrying frames each having means for grasping a plurality of wick-forming strands; means on said chains to which a carrying frame may be attached with the frame horizontal and above the plates to be elevatable by the chains from a position resting on the movable plate, in which position the projecting ends of the strands may be grasped by the frame to a raised position spaced from the movable plate; and means for rotating one of the sprockets to actuate the chains.

8. A device of the character described, comprising: a supporting structure; a pan in the bottom of the supporting structure adapted to hold a bath of molten wax; a spool rack on the supporting structure adapted to hold a plurality of spools of wick forming strand material; a horizontal plate fixed on the supporting structure above the pan, said plate having spaced tubular guideways extending therethrough; a movable plate having holes to align with the tubular guideways when said movable plate occupies a position disposed flatwise directly above the fixed plate;

means mounting the movable plate on the supporting structure for limited flatwise up and down motion sufficient to dispose the top of the movable plate above the tops of the tubular guideways; other strand guiding means on the supporting structure for guiding the strand material from the spools through the bath of molten wax and to said tubular guideways in the fixed plate; a pair of opposite endless sprocket chains running over vertically spaced sprockets at each side of the supporting structure, the upper sprockets being fixed to a common shaft, and said chains extending up from the fixed plate; a plurality of carrying frames each having means for grasping a plurality of wick-forming strands; means on said chains to which a carrying frame may be attached with the frame horizontal and above the plates to be elevatable by the chains from a position resting on the movable plate, in which position the projecting ends of the strands may be grasped by the frame to a raised position spaced from the movable plate; means for rotating one of the sprockets to actuate the chains; and adjustable stop means for limiting the elevation of the carrying frames by the sprocket chains.

9. A wick and candle carrying unit for use with candle dipping apparatus, comprising: a rigid main frame having spaced substantially parallel rails; a plurality of spaced substantially parallel bars extending crosswise of and connecting said rails; a clamping frame disposed over said bars; means connecting said frames for limited relative movement transversely of said bars; and clamping bars on the clamping frame parallel with the bars of the main frame and shiftable by movement of the clamping frame to and from a position coacting with the bars of the main frame to clamp candle wicks therebetween.

10. In an apparatus for making dipped candles, the combination of: a pan adapted to hold a bath of molten wax; means for guiding a plurality of wick-forming strands through the bath of molten wax; a bank of guideways mounted with their discharge ends all lying substantially in a common horizontal plane, each guideway being adapted to receive a wax coated wick forming strand received therein with its end portion projecting stiffly from the upper discharge end of the guideway; a carrying frame of a size to encompass the entire bank of guideways when placed flatwise over the guideways; a plurality of gripping jaws on the frame adapted to simultaneously grasp the projecting ends of all of the wick forming strands upon proper disposition of the frame over the guideways and simultaneous closure of all of the gripping jaws; means for guiding the frame into proper position over the bank of guideways; means for simultaneously closing all of the gripping jaws; and means for elevating the frame with the wick-forming strands attached thereto, to thus draw an uncoated length of the strand through the bath of molten wax and expose a length of each coated strand above the bank of guideways whereby severance of all the strands at a predetermined distance above the bank of guideways frees the frame for removal with a plurality of pre-waxed wicks of substantially equal length depending therefrom.

11. In an apparatus for making dipped candles, a device for guillotining the lower tapered ends of a plurality of candles in one operation, comprising: a portable frame from which the freshly dipped candles may hang in spaced apart relation; a horizontal guide plate

13

having holes therethrough, with the holes spaced to correspond to the spacing of the candles on the frame so that each hole will receive one candle upon proper alignment of the frame above the guide plate and lowering of the frame toward the guide plate; means on which the frame may be supported in proper alignment with the guide plate and by which it may be lowered toward the guide plate; adjustable means for defining the extent to which the frame is lowered; a guillotine guided for movement across the underside of the guide plate for severing the protruding lower ends of the candles; and means for moving the guillotine across the underside of the guide plate.

12. A device for cutting a plurality of candles to the same length, comprising: a guide plate having a plurality of holes to receive candles with the ends thereof to be cut off protruding from one face of the plate; a knife; means mounting said plate and knife for relative motion with the knife progressing across said face of the plate to sever the ends of candles protruding from the holes therein; a carrier from which a plurality of freshly dipped candles may hang with the spacing therebetween corresponding with the spacing between the holes in the guide plate; means for lowering the carrier toward the guide plate with the candles in line with the holes to effect simultaneous insertion of all of the candles into the holes in the guide plate; and adjustable means for determining the extent the candles protrude beyond the face of the guide plate at which the cutting action takes place.

13. A device for cutting a plurality of candles to the same length, comprising: a horizontally disposed guide plate having a plurality of holes therethrough; a knife mounted to move across the underside of the guide plate to sever the lower ends of candles protruding through the holes in the guide plate; a supporting structure above the guide plate; a vertically movable support carried by the supporting structure; a frame attached to said support for supporting candles in spaced apart suspended position, so that upon descent of said support, the lower ends of the candles may be caused to enter the holes in the guide plate; and a plurality of stops mounted on the supporting structure at spaced elevations above the guide plate to engage under and support the frame, said stops being selectively movable to operative positions.

14. A device for cutting a plurality of candles to the same length, comprising: a horizontally disposed guide plate having a plurality of holes therethrough; a knife mounted to move across the underside of the guide plate to sever the lower ends of candles protruding through the

14

holes in the guide plate; a supporting structure above the guide plate; a vertically movable support carried by the supporting structure; a frame attached to said support for supporting candles in spaced apart suspended position, so that upon descent of said support, the lower ends of the candles may be caused to enter the holes in the guide plate; and a plurality of stops mounted on the supporting structure at spaced elevations above the guide plate to engage under and support the frame, said stops comprising lengths of angle iron hinged to vertical members of the supporting structure and adapted to be swung to and from operative positions at which a flange thereof will engage under a candle carrying frame.

15. A device of the character described, comprising: a stationary track; a receptacle under a portion of the track; a candle butt shaping mold under another portion of the track; a carriage movable along said track between positions over said receptacle and/or said mold; a guide plate on the carriage having a plurality of holes each adapted to receive and hold the lower end of a candle; means for simultaneously inserting a plurality of candles into said holes with the lower ends thereof protruding from the bottom of the guide plate; a knife movable across the underside of the guide plate for severing the protruding ends of the candles to cause the same to drop into the receptacle when such severing of the candles takes place with the carriage over the receptacle; adjustable means for supporting the candles with respect to the guide plate so that the extent to which the candles protrude from the bottom of the holes may be varied to thus determine the finished length of the candles; said butt shaping mold having sockets to receive and shape the freshly cut ends of the candles; and means for supporting the candles at the proper elevation to have the freshly cut ends thereof enter the sockets the required amount when the carriage is in position over the mold.

ALFRED E. MOORE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
303,984	Coddington	Aug. 26, 1884
567,392	Hough	Sept. 8, 1896
647,876	Propfe	Apr. 17, 1900
710,806	Robsam	Oct. 7, 1902
725,704	Harvey	Apr. 21, 1903
1,906,444	Bixby	May 2, 1933
1,993,709	Chamberlain	Mar. 5, 1935