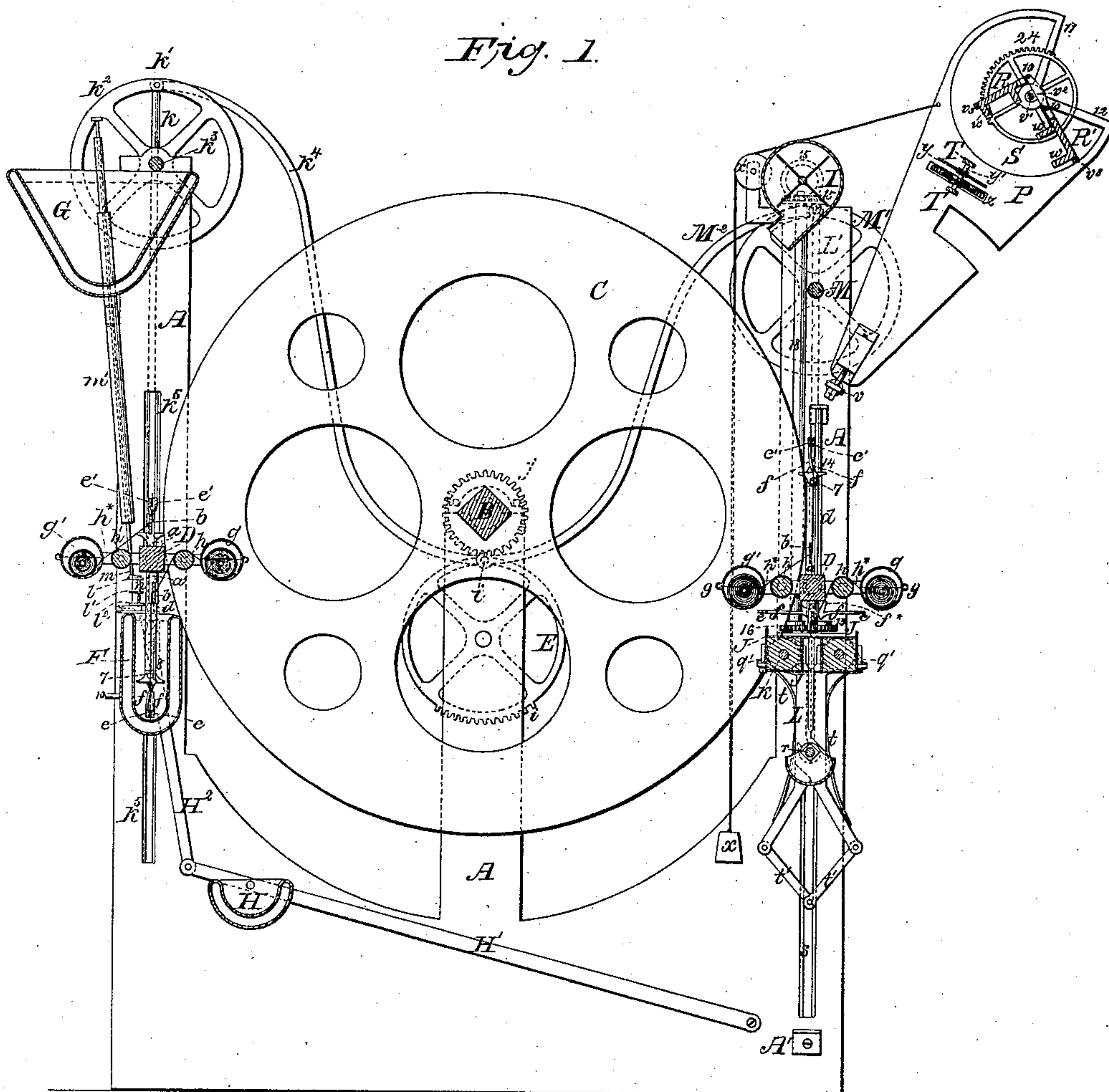


V. SQUARZA.

Machine for Making Candles.

No. 14,376.

Patented March 4, 1856.



V. SQUARZA.

Machine for Making Candles.

No. 14,376.

Patented March 4, 1856.

Fig. 2.

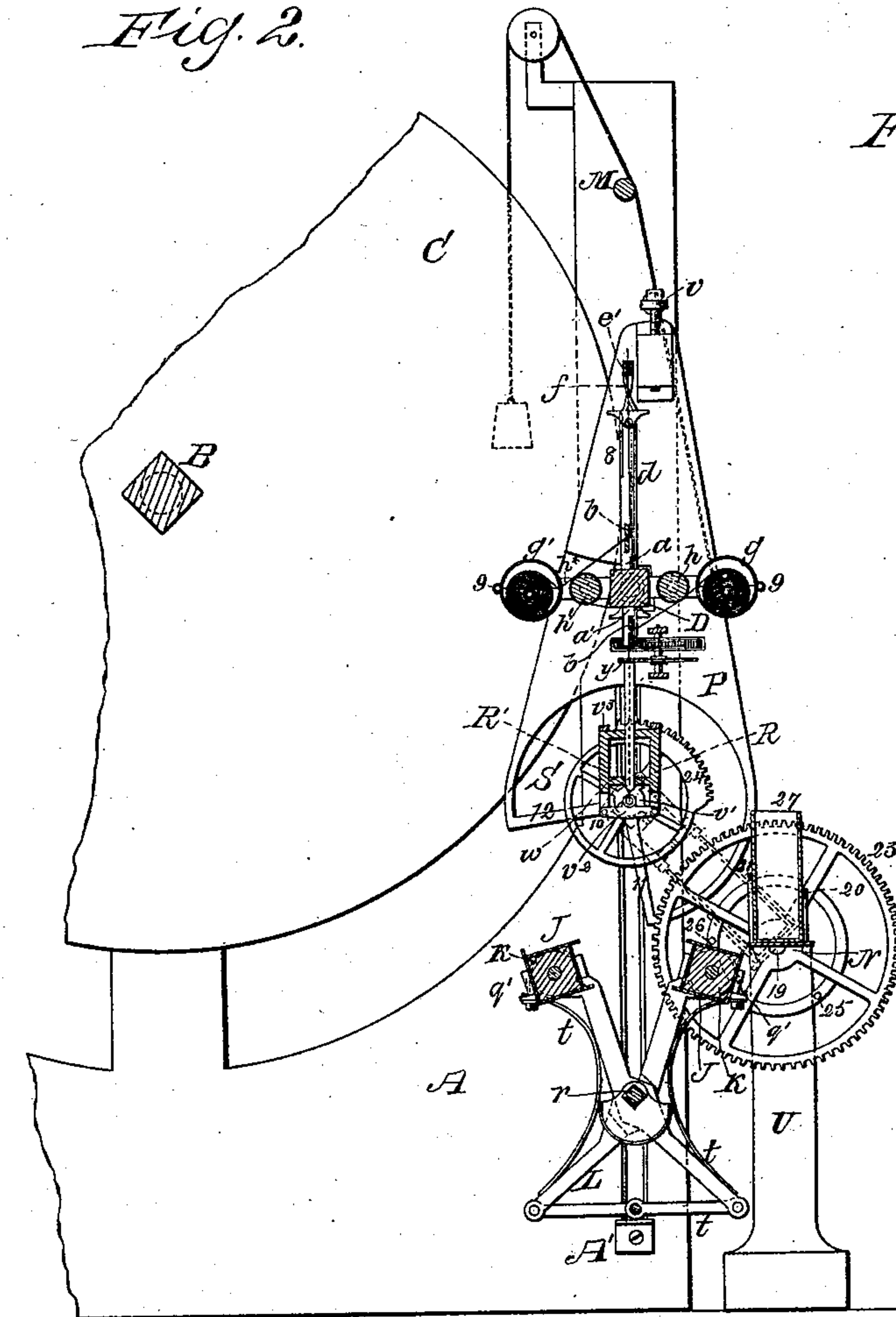


Fig. 4.

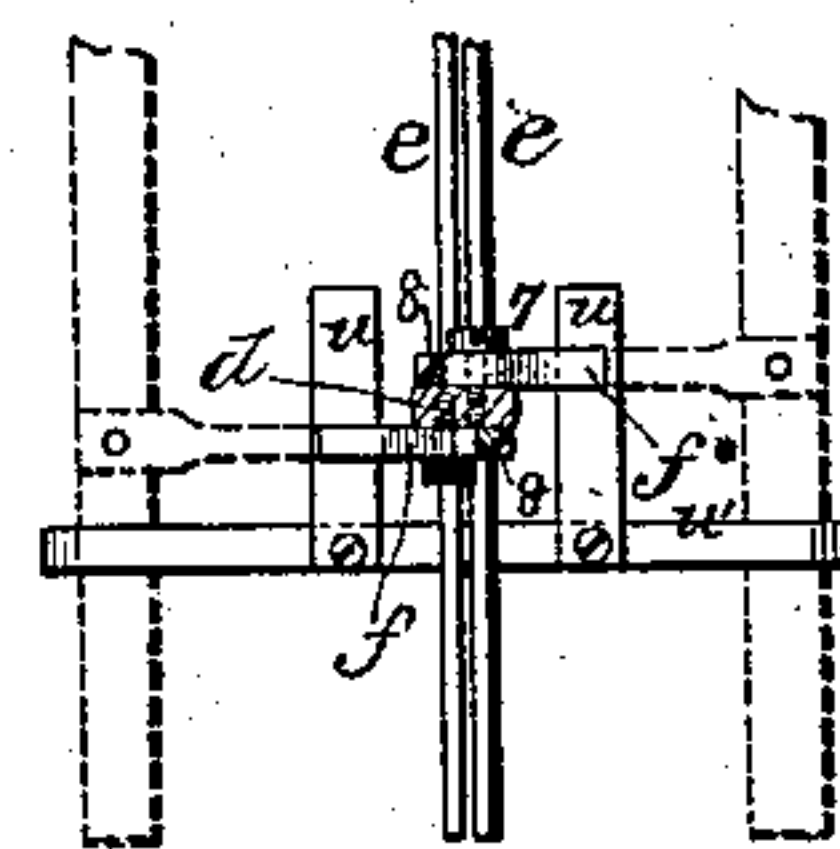
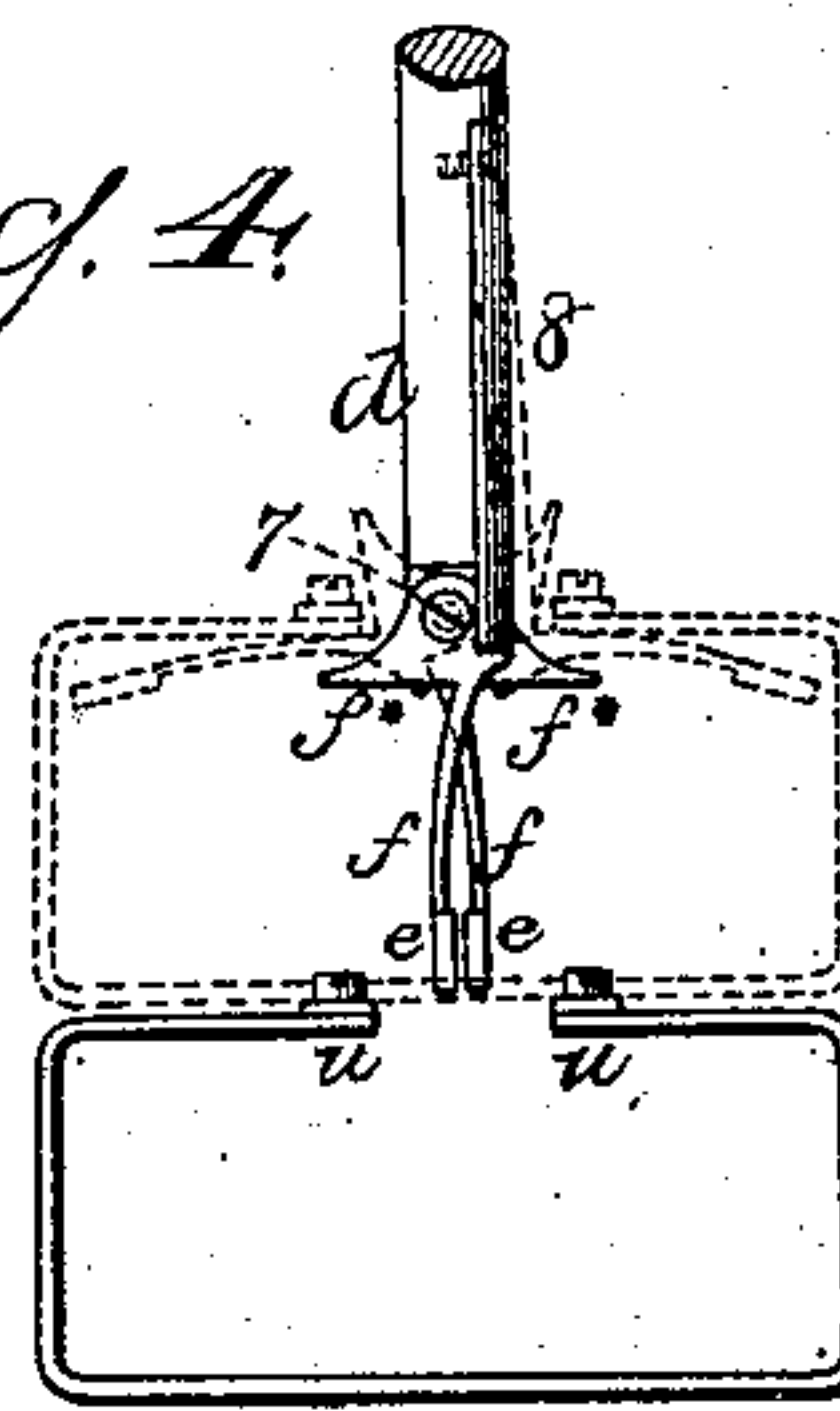


Fig. 5.

Fig. 7.

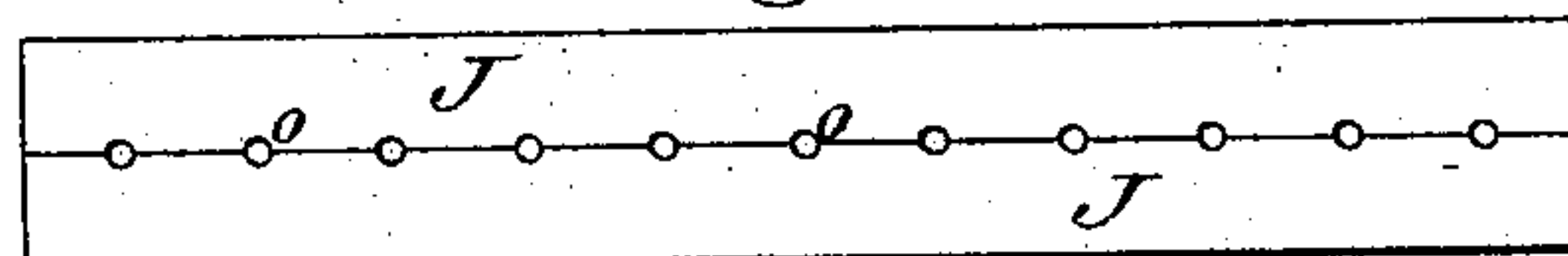


Fig. 6.



UNITED STATES PATENT OFFICE.

VINCENZO SQUARZA, OF NEW YORK, N. Y.

CANDLE-DIPPING MACHINE.

Specification of Letters Patent No. 14,376, dated March 4, 1856.

To all whom it may concern:

Be it known that I, VINCENZO SQUARZA, of the city, county, and State of New York, have invented an Improved Machine for
5 Making Candles; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a vertical section of the machine. Fig. 2 is a similar section of a portion thereof in a different condition to that shown in Fig. 1. Fig. 3 is a front elevation of the machine. Figs. 4, 5, 6 and 7
15 are detail views of portions of the machine.

Similar letters of reference indicate corresponding parts in the several figures.

In this machine the candles are produced by the dipping process, and by it the whole
20 process of manufacture from the first dip of the wicks to the putting of the candles in boxes is performed, the candles being equalized in diameter from end to end and having their top ends tapered off like mold
25 candles. The machine supplies itself with wick and the dipping trough keeps itself supplied always to the same level with tallow, and the machine is almost entirely automatic in its operation.

30 To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, A, are two standards constituting the principal portion of the frame of the machine and carrying the bearings for the
35 main shaft B, to which are firmly secured, as far apart as possible, two large wheels C, C, which carry what I will term the wick frames, of which there may be as many as the circumference of the wheels C, C, allows, though only two are shown in Fig. 1
40 and only one in Fig. 3. The wick frames are in pairs and each pair carried by a distinct shaft D, whose journals are received in boxes a^* , a^* , secured to the periphery of the wheels C, C, the said shaft D, being
45 parallel with the main shaft B. Only one frame of each pair is to be used at a time. Each pair is constructed in the following
50 manner: The shafts D, are preferably of square form. Two fixed stands a , a , are attached securely to one side of each shaft, perpendicular thereto, and not far from the ends thereof, and two similar stands a' , a' ,
55 are similarly attached to the opposite side

thereof, see Fig. 3, where the four stands are shown, and Figs. 1 and 2, where one on each of the top and bottom sides of the shaft is shown. Each pair of these stands, that is to say, those two on either side of the
60 shaft, carries a bar b , which is divided longitudinally into two parts and contains a number of holes c , c , see Fig. 3, which are formed half in each part of the bar, the said holes being of such size that the wicks,
65 which are shown in red color, may be received in them, but cannot be drawn through them without the application of a considerable force.

On the outside of the stands a , a , and a' , a' ,
70 that is to say nearer to the ends of the shaft, as shown in Fig. 3, a pair of rods d , d , is fitted to slide through holes bored diametrically through the shaft, the said rods being parallel with the stands a , a . To one end
75 of this pair of rods is attached a pair of clamping bars e , e , which extend nearly the whole distance between the wheels C, C, the said bars being carried by arms f , f , which are pivoted to the rods d , d , by pivots 7, 7,
80 and have strong steel springs 8, 8, applied to them, as shown best in Fig. 4, where a view of one end of one of the rods and end view of the clamping bars is given on a larger
85 scale than the other figures, in such a manner that whether the bars are closed together to clamp the wicks, as shown in black outline in Fig. 4, or thrown apart, as shown in
90 blue outline in the same figure, they are held secure in position by the said springs. To the opposite end of the rods d , d , is pivoted another and precisely similar pair of
95 clamping bars e' , e' . The length of the rods d , d , and arms f , f , is such that when the arms f , f , of the upper pair of clamping bars are in contact with the shaft D, and resting thereon, which is the supposed condition of the pair of wick frames represented at the left hand side of Fig. 1, the
100 distance between the other pair of clamping bars and the bars b , b , on the corresponding side of the shaft D, is a little greater than the intended length of a candle, so that a row of wicks may be held by the said clamping bars and bars b , b , to be dipped. The
105 wicks are supplied from two long cylindrical boxes g , g' , which are carried by arms h^* , h^* , extending from opposite sides of the shaft at right angles to the rods d , d . These boxes are each made in two parts hinged to—
110

gether by hinges 9, 9, to enable balls of wick to be inserted, a separate ball being employed for each wick and a separate compartment being provided in the boxes for every ball. One of the boxes contains wick to supply one wick frame which is composed of the clamping bars e , e , and the bars b , b , on the same side of the shaft, and the other box contains wick to supply the other wick frame composed of the opposite set of clamping bars e' , e' , and the corresponding bars b , b . The wicks pass out of the boxes through holes provided for the purpose, and from thence all the wicks of one box and frame pass one or more times around a long roller h , arranged between the box and the shaft D, and from thence through the holes c , c , of the respective bar b , and from thence to the clamping bars, by which the extremities are held tightly, all the wicks of the other box passing around a similar roller h' , similarly arranged with respect to it. The rollers h , h' , should be furnished with ratchets and pawls or be so fitted to their bearings in the arms h^* , h^* , as not to move so easily as to allow the wick to get loose, as it must be kept stretched out straight between the clamping bars and bars b . The two frames of each pair are to be used by turns in the manner to be hereinafter explained each being made to draw out its own wick by sliding the rods d , d , through the shaft to bring it into an operative condition. The wick frames, wick boxes and their appendages hang freely by reason of the shaft D, being fitted easily in its journal boxes and the weight of the operative wick frame below the shaft keeps the said frame and the wicks always vertical as the wheels C, C, rotate.

The wheels C, C, rotate intermittently. They receive motion from the constantly revolving driving wheel or pulley E, through a toothed sector i , attached to the hub of the said pulley, gearing with a toothed wheel j , on the shaft B. This sector is only about one fourth of a circle, so that the intermissions between the periods of movement of the wheels C, C, are of considerable duration. Every movement of the wheels brings one of the shafts D, and its wick frame to the position shown at the left hand side of Fig. 1, which is directly over the center of the dipping trough F, which extends nearly the whole width of the frame. The successive coating of the tallow or other material of which the candles are to be formed are given by raising this trough to the candles instead of lowering the candles into the trough as in the usual process, and for this purpose the dipping trough is suspended by two rods k , from wrists k' , attached to the outer sides of two wheels k^2 , which are fast on the ends of a shaft k^3 , which receives rotary motion from the driving wheel of

the machine through a rod k^4 , connecting the wrist k' of one of the wheels k^2 , with a wrist i' , on the driving wheel E, or sector i . The reciprocating movement thus given to the trough F, is confined to a vertical direction by slotted guides k^5 , in the framing. The movement is so timed that as each wick frame is stationary in the position last named the trough rises high enough for the wicks to be received within it to take a coating of tallow, and then descends clear of the wick frame before the next movement of the wheels C, C, commences. The tallow in the dipping trough is kept melted by surrounding it with a steam jacket which is supplied with steam by a flexible pipe at 10, see Fig. 1. The dipping trough keeps itself supplied to the same level with melted tallow from a reservoir G, above, by means of one of a number of arms l , l' , l^2 , attached to the said trough, striking the bottom of the stem m , of a valve in a pipe m' , at the bottom of the said reservoir as the trough rises, and opening the said valve to let a quantity of tallow escape through the said pipe into the trough. The valve closes by its own weight aided by the pressure of the column of tallow above it as the trough descends. The quantity of tallow thus supplied is regulated to preserve the proper level in the trough by placing the arms l , l' , l^2 , at different elevations on a pivot n , which is secured to the top of the trough, as shown in Fig. 1, and turning either one or other of them to the position occupied by l , in Fig. 6, which is a top view of the said pivot n , and its arms. The arm which is in the above named position is the one which will operate on the valve and according as it is higher or lower will keep the valve open a greater or less time. The tallow in the reservoir, like that in the dipping trough, is kept melted by a steam jacket. The succeeding movement of the wheels C, C, after the dipping of every frame of wicks brings the frame over a long trough H, of hot water, which is suspended from two levers H' , at opposite sides of the frame, the said levers being connected by links H^2 , with the dipping trough, so as to be lifted along with it, and when the dipping trough rises during the next intermission of the motion of the wheels the water trough rises with it, high enough for the clamping bars and a portion of the wicks to be submerged. By this means the tallow is melted off the lower parts of the wicks and a taper point is produced to form the tip of the candle. The time occupied by the revolutions of the wick frames is sufficient to allow each coating of tallow to become sufficiently hard to receive another coating. The hardening is expedited by the cooling effects of the air from a rotary fan blower I, arranged at

the top of the machine in such a position as to play upon the partly formed candles in one of their positions of rest. The dipping process is repeated on all the wicks at every revolution of the wheels, and as soon as the candles have assumed the requisite size the dipping trough is disconnected from the rods k , which can be readily done if the connection is effected by hooks, and preparation is made for finishing off the candles to a perfectly cylindrical form.

The finishing of the candles is effected by passing them through circular holes o , o , in one or more draw plates, J , J , such as are shown in Fig. 7. Each of these draw plates is composed of two parts, one half of each hole being in one part and the other half in the other part. The holes are made with edges sufficiently sharp to scrape off the superfluous tallow. One half of each draw plate is secured to one of two square horizontal rollers K , K , see Figs. 1, 2, 3, and the other half to the other of the said rollers, the said rollers being arranged parallel to each other with their journals resting in boxes attached to two pairs of nippers L , L , which have the same pivot consisting of a horizontal shaft r , which extends through both sides of the framework of the machine and is connected outside the framework by two connecting rods L' , L' , with two wrists p , p , on two wheels M' , M' , which are secured on a shaft M , which receives continuous rotary motion through a connecting rod M^2 , connecting one of the wrists p , with the same wrist i' , by which the shaft k^3 , before described, is driven. The shafts of the rollers K , are provided with toothed wheels q , q , shown in Fig. 3 and indicated by dotted circles in Figs. 1 and 2, to be engaged by spring catches q' , q' , attached to the nippers, to lock them in place and prevent them turning, so that the draw plates may close and be rigid like the jaws of a common pair of nippers, and these toothed wheels require to be released from the catches to bring a different sized draw plate into an operative position. The drawing of the candles will be commenced with draw plates with larger holes, smaller ones being used successively. Two draw plates of different sizes may be used at a time, the largest being attached to the under side and the smallest to the upper side, the candles being drawn upward through the draw plates. As the upper part of the candle is left the smallest by the dipping operation it will be of little consequence if the larger draw plate should not commence quite at the top. The drawing is performed while the candles are stationary in the position shown at the right hand side of Fig. 1, by reason of the intermissions of the revolution of the wheels C , C , the necessary movement being given to the draw plates by the raising and lowering

of the shaft r , and the proper direction of the movement, viz., in a vertical line, being preserved by the shaft r , working in slotted guides s , in the framing A , A . The nippers are kept closed during their descent until near its termination by springs t , t , but as their descent terminates they are opened by the action of toggle joints t' , t' , which connect their lower ends, the said toggle joints coming in contact with stationary stops A' , A' , attached to the framing A , A , and being thus straightened out to force apart the lower ends of and open the nippers. During their ascent the nippers remain open to receive the next row of candles between them, and when their ascent terminates they are closed by two attendants, who always stand ready at opposite ends of the machine. As the wick frames severally arrive in position for the drawing or finishing operation, the lower clamping bars e , e , or e' , e' , as may be, require to be opened out of the way of the draw plates, as shown at the right hand of Fig. 1. The opening of the clamping bars is effected by means of two toes u , u , see Figs. 4 and 5, which are attached to the top of a frame u' , which is arranged as shown in Fig. 3, at the top of a standard N , which is secured to the shaft r . This standard remains always upright, as the shaft r , does not turn. The above named toes u , as the shaft r , rises come in contact with two fingers f^* , f^* , on the arms f , f , which carry the clamping bars and as the frame u' , rises with the drawing apparatus force up the said fingers from the position shown in black in Figs. 4 and 5 to that shown in blue in the same figures, thus opening the clamping bars to such a position, in which they are held secure by the springs 8 , 8 , that the draw plate rollers K , K , and nippers L , L , may pass between them to the top of the candles which are left hanging from the bars b , b , during the descent of the nippers in a closed state to perform the drawing operation. The tallow scraped off by the draw plates falls into a trough V , which is suspended below the shaft r .

It is hardly necessary to mention that the machine will never be in the condition shown in Fig. 1, with the dipping and the drawing operation going on at the same time, but is shown so to explain both parts of the process in the same view.

When the several wick frames have been successively brought to the position shown at the right of Fig. 1 and have had the candles contained in them submitted to the drawing operation one or more times, as may have been necessary, the shaft r , the connection between which and the rods L' , L' , is by hooks, is disconnected by the attendants and allowed to descend, as shown in Fig. 3, to make room for the apparatus by which the cutting off of the can-

dles from the wick and the placing of them in boxes are performed. This apparatus during the operations of dipping and drawing is slung up out of the way, as shown in Figs. 1 and 3. It consists of two parallel frame pieces P, P, hung to swing on pivots v, v , which are secured to the framing A, A, and carrying a number of rotary shears, and a pair of carrying jaws. The carrying jaws work on a shaft v' , which is secured to the frame pieces so as not to revolve. This shaft is fitted with two small beams v^2 , to the opposite ends of which the two carrying jaws R, R', are attached. The joints 10, 10, which connect the jaws with the beams v^2 , are what are known as knife handle joints, being furnished inside with springs which tend to hold the jaws opened or closed, as may be required. The side frame pieces have each an opening S, in them, of the form of three quarters of a circle described from the center v' , and the jaws have each a long bar v^3 , attached to their extremities, the ends of which bars pass through the said openings S, so that they may rest against either of the straight ends 11 or 12, of the opening. The jaws are provided with two pairs of ridges w, w , with recesses formed in their faces to receive the candles. Before bringing the frame P, P, down from the position shown in Fig. 1, where it has been held by weights x , attached to cords passing over pulleys x' , the joint of the lower jaw R', is straightened out in line with the beam v^2 , and its bar w , held by the attendants against the ends 12, of the openings S, in the frame P, P, and the joint of the upper jaw R, is bent as shown in Fig. 1, and then when the frame P, P, comes down the jaw R', is allowed to pass under the candles until the jaw R, nearly reaches them, when the joint of the jaw R', may be bent up to the position shown in Fig. 2, in black outline, by which act all the candles in the frame are grasped in the jaws.

The shears consist of a row of sharp edged flat circular disks y, y , secured upon a row of small spindles y', y' , which work in bearings in two rails T, which extend from one to the other of the side pieces P, P. These disks lap one another closely to act like shears and their spindles are all geared together, so as to derive motion one from another, and the extreme right hand one, shown in Fig. 1, is geared with a larger spur wheel z , part of which protrudes through one of the side pieces P, P, so that it may gear with a small spur wheel 13, on an upright shaft 14, which works in bearings attached to the framing A, A, and receives constant motion through a spur wheel 16, from another upright shaft 18, which is driven by a pair of bevel wheels 15, 15, from the blower shaft. The wheel z , is not intended to come into gear with the wheel 13,

till the jaws have closed upon the candles, and then the frame P, P, is swung in a little farther to allow it to come into gear and at the same time to bring the edges of the rotary cutting disks into contact with the wicks close above the candles. The rotary action of the disks, which commences as soon as the wheel 13, comes into gear, instantly severs all the candles and leaves them held by the jaws R, R'.

The boxes to receive the candles are placed upon a table N, see Fig. 2, which is secured to a shaft 19, resting in bearings in a stand U, which is placed in front of the machine, before the cutting off of the candles commences, but at other times may be put out of the way. This table extends all across the machine and has two guard rails 20, 21, extending all along it, between which the boxes 27, one of which is shown in Fig. 2, are placed. The shaft 19, carries a toothed wheel 23, which is arranged opposite to a toothed sector 24, attached to the hub of one of the beams v^2 . During the whole operation of taking the candles in the jaws R, R', the sector 24, is out of gear with the wheel 23, and the table N, stands horizontal with the boxes upright, as shown in black in Fig. 2, but when after the cutting off of the candles the jaws are swung over by hand toward the position shown in blue outline in Fig. 2 the sector comes into gear and moves the table and the boxes over toward it, as shown by the blue outline, so that the attendants by opening the jaws let all the candles slide out gradually into the box without being broken or injured. When the jaws are swung back to receive the next row of candles the sector acting on the wheel 23, throws the table and boxes again into the position shown in black outline, thus bringing the boxes upright, allowing the candles to drop down gradually to the bottom. The swinging movement of the table is controlled by two stop pins 25, 26, attached to the wheel 23, to come in contact with the side of the stand U.

After one batch of candles has been completed and cut from the machine the only preparation necessary for the next is for the attendants to slide the rods d, d , through the shaft, when the opposite pairs of clamping bars to those which have been in use draw out from their respective wick-boxes the wicks for the next batch of candles, and then to turn the shafts D, or let them go over, half way around, to bring the now extended wick frames into condition for dipping, as shown at the left hand of Fig. 1. Before proceeding, however, the clamping bars which were last in use should be closed to bite the ends of their respective wicks to be ready to supply themselves when another batch of candles shall have been completed. Thus the opposite wick frames of each pair attached to the same shaft D, are used by

turns, the object of such arrangement being to make the frames self supplying. The sliding of the rods d, d , to change the wick frames and supply them with wick may be performed before the drawing and cutting off of the candles, if desirable, to allow more room for the drawing and cutting off apparatus. This is supposed to be the case in the drawing.

Among the great advantages possessed by this machine over all others heretofore used in the manufacture of candles the most important are that it makes the candles more compact and of more uniform thickness, it insures a concentric position of the wick, it causes the candles to bleach almost immediately to a pure white color. The candles are found to burn with an economy of near 20 per cent., and the light produced is uniform throughout by reason of the uniformity of size.

It will be understood that the only limit to the number of candles made by this machine will be the width of the machine. Only two attendants will be required for a machine of any size.

Instead of being long enough only for a single candle the length of wick coated at once by the dipping operation may be long enough for two or three candles and the candles may be cut off the proper length, points being produced on the remaining portions of dipped wick after cutting off one lot of candles by making the machine perform another revolution to dip them in the water trough H.

The drawplates may be arranged to draw the candles after every dip if desirable, and in making candles of stearin or other substances which harden quickly the drawplates should be arranged as close as possible to the dipping trough.

Having thus fully described my invention, I will proceed to state what I claim and desire to secure by Letters Patent:

1. I claim the employment of intermittently rotating vertical wheels C, C, or their equivalents carrying a number of wick frames or wick holders, in combination with a rising and falling dipping trough F, substantially as herein described.

2. I claim keeping the dipping trough supplied to the proper level with tallow from a reservoir above by a valve which is opened by the trough or by some attach-

ment thereto every time it rises substantially as herein described.

3. I claim the within described method of regulating the supply of tallow to the dipping trough to make up exactly for the quantity taken therefrom by dipping, by the employment of two or more arms l, l', l'' , arranged at different elevations on a pivot n , attached to the trough so that either one of them can be turned to a proper position to lift the valve in the reservoir.

4. I claim the employment for the purpose of tapering off the points of the candles, of a trough H, of hot water into which the candles are plunged by the raising of the said trough, while the candles are stationary substantially as herein described.

5. I claim the construction of the wick-frames in pairs each pair consisting of a shaft D, carrying two fixed bars b, b , two sliding rods d, d , to which are attached two pairs of clamping bars e, e , and e', e' , and two wick boxes g, g' , all the said parts being arranged and operating substantially as herein described so that each frame of the pair may in its turn be supplied with wick as required to commence a new batch of candles.

6. Though I do not claim the reduction of dipped candles to a uniform size by passing them through draw plates I claim constructing the draw plate in two parts attached each to the jaw or jaws of one or more pairs of nippers whether attached rigidly, or to rollers fitted to the said jaws as herein described.

7. I claim the swinging frame P, P, with its jaws R, R', and rotary cutters y, y , all operating substantially as described to take hold of the candles and cut them off when finished.

8. I claim the arrangement and combination of the table N, which carries the boxes, and the jaws R, R', which take the finished candles substantially as described, that is to say, hanging both the table and jaws on shafts or centers and gearing them together so that they will move in such a way as to deposit the candles in the boxes, gently and without injury.

VINCENZO SQUARZA.

Witnesses:

WM. TUSCH,

R. W. FENWICK.