No. 834,124. PATENTED OCT. 23, 1906.

P. S. GUILFORD.

ICING MACHINE.

APPLICATION FILED APR. 2, 1906.

3 SHEETS—SHEET 1.

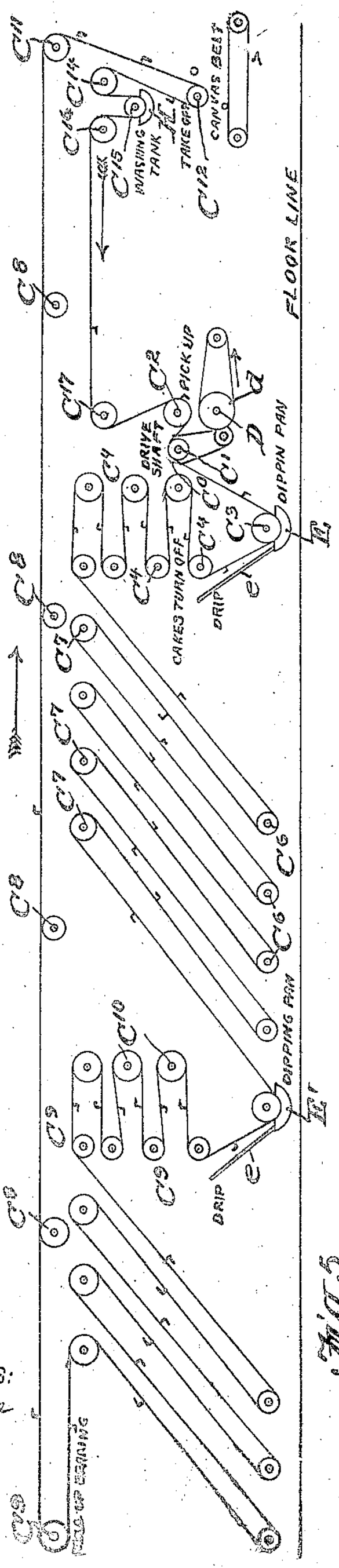

Fig. 1.

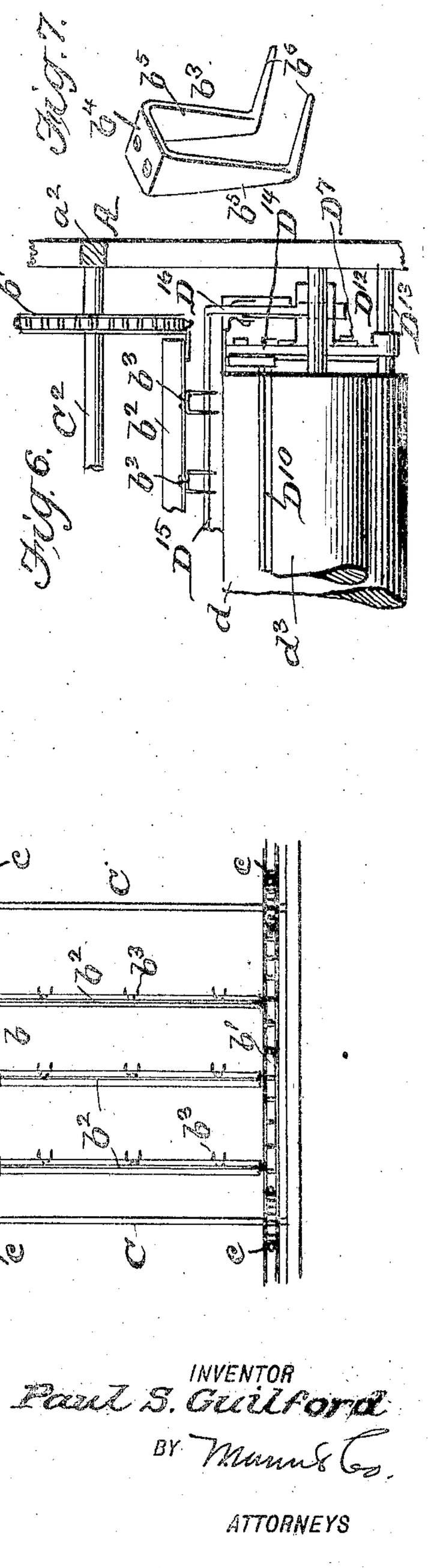

Fig. 6.

Fig. 5.

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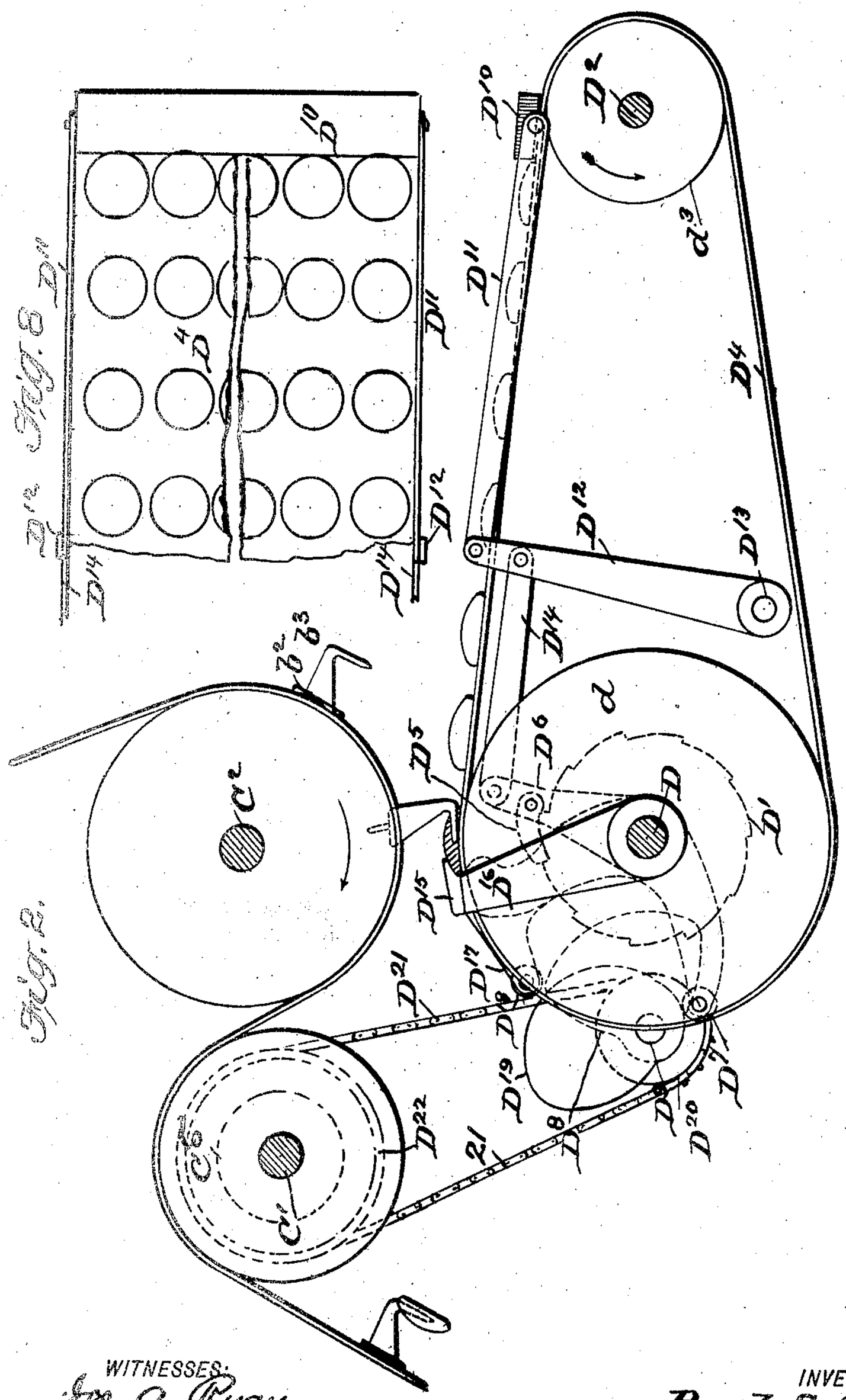

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3 SHEETS—SHEET 3.

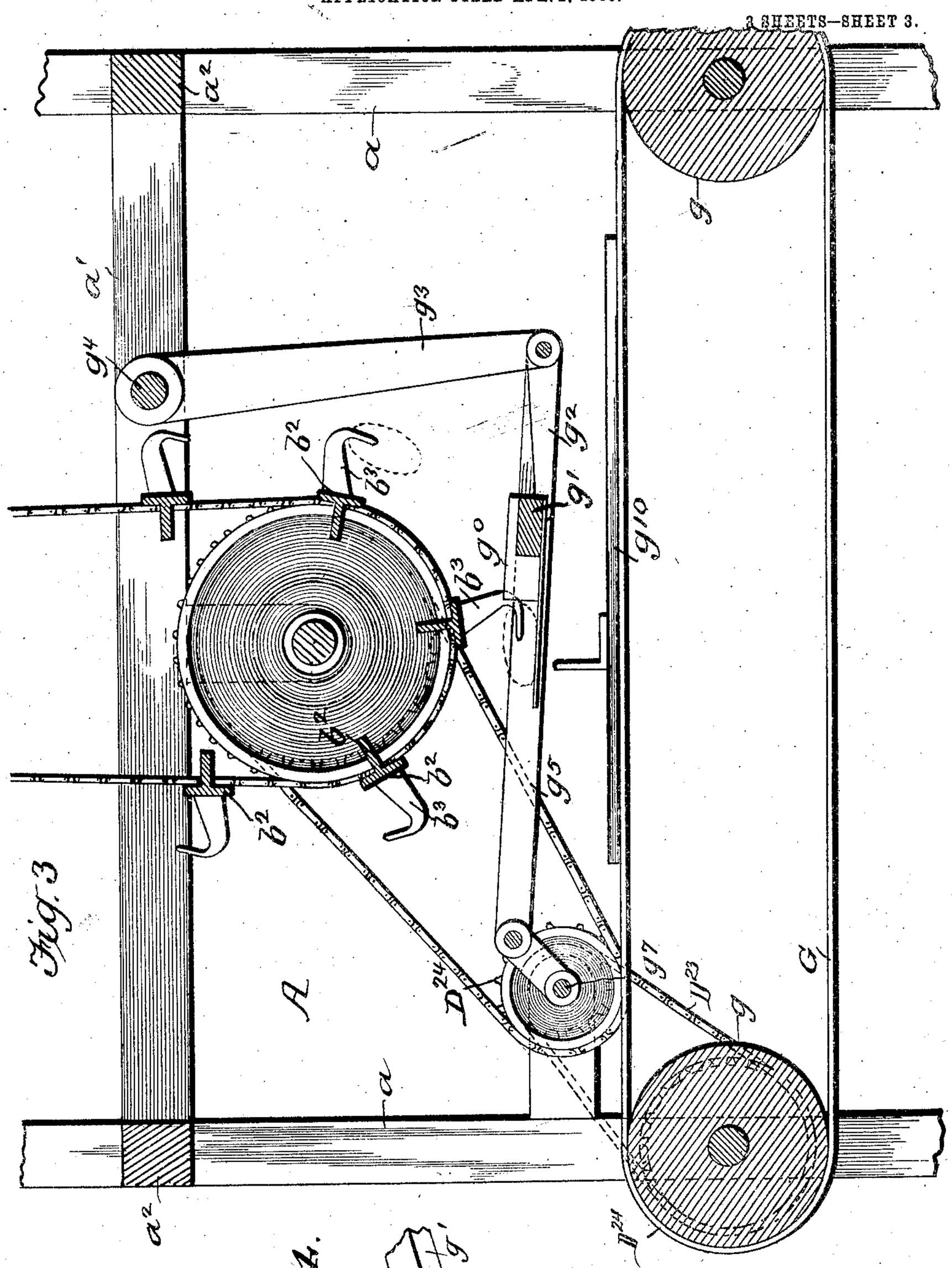

Fig. 3.

Fig. 4.

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ICING-MACHINE.

No. 834,124. Specification of Letters Patent. Patented Oct. 23, 1906.

Application filed April 2, 1906. Serial No. 309,359.

To all whom it may concern:

Be it known that I, PAUL S. GUILFORD, a citizen of the United States, and a resident of Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Icing-Machines, of which the following is a specification.

My invention is an improvement in icing-machines; and it consists in certain novel constructions and combinations of parts hereinafter described and claimed.

In the drawings forming a part hereof, Figure 1 is a diagrammatic side view of my complete machine. Fig. 2 is a detail sectional side view of the cake-presenting mechanism. Fig. 3 is a similar view of the take-off mechanism. Fig. 4 is a perspective of a portion of the take-off bar. Fig. 5 is a plan view of a portion of the endless carrier. Fig. 6 is a rear view of a portion of the presenting mechanism. Fig. 7 is a detail perspective view of one of the forks. Fig. 8 is a detail plan view of a part of the cake-presenting belt and the line-up bar.

In the present embodiment of my invention the cakes to be iced are supported during the different operations of icing, turning, and drying upon forks connected to an endless carrier having its course of travel arranged to pass the cakes through the various positions required by such operations.

The mechanism is supported by a frame A, comprising the side plates *a*, connected together by the shafts to be hereinafter described.

The endless carrier B comprises a pair of parallel sprocket-chains *b b'*, connected at spaced intervals by T-shaped bars b^2. Forks b^3 are secured in spaced relation upon the bars, the said forks comprising a base b^4, having upturned arms b^5 projecting outwardly from the base, the ends of the arms being pointed and bent at b^6 in the direction of travel of the carrier.

The endless carrier B is supported upon a plurality of shafts journaled at various points within the frame and provided at each end with sprocket-wheels for engaging the sprocket-chains. The description of the course of the carrier will be commenced at the point where the cakes are taken up by the hooks. The carrier at this point passes beneath a shaft C^2, provided with the usual sprocket-wheels, and over a shaft C', on the outer end of which is a pulley C^0, connected by a belt with a suitable source of power. The carrier passes downward over the drive-shaft C' beneath a shaft C, arranged above a receptacle E for an icing mixture, the sprocket-wheel *c* upon the said shaft being so arranged with respect to the receptacle that the cakes upon the forks are passed through the icing mixture. From the shaft C^3 the carrier passes upward at an angle to the series of shafts C^4, said shafts being arranged in parallel vertical lines, the lines being spaced apart a short distance from each other, whereby to constrain the carrier to pass in a series of relatively short horizontal parallel lines. It will be evident from an inspection of the drawings that the carrier in passing over this series of rollers has its upper and lower faces alternately reversed, whereby to turn the cakes at short intervals to even the icing mixture thereupon. A drip-board *e* is arranged beneath the run of the carrier, extending from the shaft C^3 to the shaft C^4, whereby to return the surplus icing mixture into the tank.

From the shaft C^4 the carrier passes downwardly at approximately an angle of forty-five degrees beneath a roller, the said roller being one of the members of a series of rollers C^6, arranged in the same horizontal plane, and upwardly over a second roller, the said roller being a member of a second series of rollers C^7, arranged in the same horizontal plane and parallel to the series C^6, the carrier passing beneath the members of the series C^6 and above the members of the series C^7, thus being constrained to pass in a series of parallel lines over a sufficient distance to properly dry the icing mixture on the cakes.

Beneath the last shaft of the series C^6 is arranged a second dipping-tank E', provided with the usual dripping-board *e*, and above the dipping-tank is arranged a second series C^9 C^{10} of shafts arranged in parallel vertical lines, whereby to again turn over the cakes to even the icing mixture, after which the carrier is again constrained to travel over parallel series of shafts arranged in the same manner as the series C^6 C^7, before described. From thence the carrier passes around the shaft C^9 and in a horizontal plane to the other end of the machine, the horizontal run of the carrier being supported by a plurality of supporting-shafts C^8, supplied with the usual sprocket-wheels *c*. At the opposite

end of the machine the carrier passes around a shaft C^{11} and downwardly to the roller C^{12}, beneath which is arranged a take-off mechanism to be hereinafter described. From the shaft C^{12} the carrier passes upwardly over a shaft C^{14} and downwardly beneath a shaft C^{15}. Beneath the shaft C^{15} is a receptacle H, containing water for the purpose of washing the forks as they pass therethrough. From the shaft C^{15} the carrier passes upward over the shaft C^{16} and again in a horizontal plane to the shaft C^{17}, from whence it passes downwardly beneath the shaft C^2, before described.

Beneath the shaft C^2 is arranged the mechanism for presenting the cakes to the forks and for supporting them during their transfixion by the forks.

Beneath the shaft C^2 is journaled a shaft D, having rotatably mounted thereon a roller d and provided on one of its ends with a ratchet-wheel D'. A counter-shaft D^2 is journaled at a suitable distance from the shaft D, and a roller d^3 is arranged upon the said shaft. A canvas belt D^4 is supported by the rollers d d^3, the said belt being intermittently actuated by a pawl D^5, pivoted to a rocking lever D^6, journaled upon the shaft D and provided at its opposite end with a friction-roller D^7, engaged by a cam D^8 upon a cam-shaft D^9, journaled within the frame.

A lining-up bar D^{10} is provided for properly spacing the cakes upon the belt, the said bar normally resting upon the belt and being connected at either end by a link D^{11} with the upwardly-projecting arms D^{12} of the rock-shaft D^{13}, journaled in the frame. One of the arms D^{12} of the rock-shaft D^{13} is connected by a link D^{14} with the upper end of the rocking lever D^6 above the pawl.

It will be evident from the description that when the rocking lever D^6 is actuated by the cam to move the ratchet-wheel it will also move the lining-up bar by its connection therewith to properly space the cakes with respect to the belt. The lining-up bar moves a trifle faster than the canvas belt, thus correcting any irregularity of the cakes with respect to the belt.

That portion of the belt immediately beneath the shaft C is arranged at such a height that the cakes resting thereon will be in position to be transfixed by the forks upon the endless carrier, and a stop-arm D^{15} is arranged to support the cakes during their transfixion by the forks. The said arm comprises a bar extending across the width of the belt and supported at each end by arms D^{16}, projecting upward from the shaft D and rigid therewith. The said shaft is provided with another arm D^{17}, rigid therewith and provided with a friction-roller D^{18}, engaged by a cam D^{19} upon the cam-shaft D^9. The contour of the cam D^{19} is such that the stop-arm is held in position to resist the forward motion of the cake until its transfixion by the hooks, after which the said bar immediately drops out of the path of the cake, whereby to allow the forward motion thereof upon the hooks.

It will be understood that the cakes are placed upon the belt in rows corresponding to the rows of hooks and that the stop-arm engages an entire row, each member of the row being transfixed at the same period of time.

After the completion of the operation of dipping, turning, and drying the cakes it is necessary to remove them from the hooks, and for this purpose I have provided a mechanism, as shown in Fig. 3. This mechanism comprises a take-off bar g', extending across the full width of the carrier and having lugs g^0 for engaging the cakes between the arms of the hooks. The said take-off bar g' is connected by brackets g^2 with the arms g^3 of the rock-shaft g^4, journaled in the frame, the said rock-shaft being actuated from a crank-shaft g^7, journaled in the frame and connected to the lower end of the rock-shaft by the link g^5. The take-off bar moves slightly faster than the carrier, thus engaging the cakes and removing them from the hooks.

Below the take-off mechanism is arranged a second canvas belt G, supported upon rollers g, journaled in the frame, the said belt moving in the same direction with the carrier and adapted to receive a cake-board g^{10}, on which the cakes fall as they are removed from the hooks.

The cam-shaft D^9 is provided on its outer end with a sprocket-wheel D^{20}, connected, by means of the sprocket-chain D^{21}, with the sprocket-wheel D^{22} upon the outer end of the drive-shaft, and one of the rollers g of the belt G is driven from the crank-shaft g^7 by means of a sprocket-chain D^{23}, engaging sprocket-wheels D^{24} D^{25} upon the outer ends of the shaft g^7 and the shaft of one of the rollers g, respectively.

In operation after the machine has been set in motion the cakes are placed upon the canvas belt D^4 by an attendant, and by means of the pawl-and-ratchet connection the belt is moved forward with the cakes thereon, the rows being lined up with respect to the belt by the lining-up bar.

Upon reaching the stop-arm the cakes are supported until transfixed by the hooks, after which the stop-arm moves out of the way and the cakes proceed in their travel to the dipping-tank. After dipping they are passed to the turning-over arrangement for reversing the position of the cakes to even the icing and from thence to the drying arrangement. While I have shown two dipping-tanks and two arrangements for drying and turning the cakes, it is obvious that more or less than two could be used.

It will be understood that during the operation of turning over the cakes the carrier travels in short parallel runs, while in the operation of drying the cakes the carrier travels in longer runs. This arrangement provides a comparatively quick turning of the cakes while the icing is still in its most fluid state and a slower turning motion when it becomes drier. Upon reaching the long horizontal run of the carrier the icing is, comparatively speaking, fixed and is not liable to run.

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

1. In apparatus of the class described and in combination, a cake-carrier comprising a plurality of parallel endless belts, bars connecting the belts at spaced intervals, cake-transfixing forks connected with the bars and spaced thereon, means for continuously moving the carrier, means for presenting the cakes to the forks comprising a belt arranged below the lower arm of the carrier and moving in the same direction, means for intermittently moving the belt, a stop-arm for engaging and supporting the cakes during transfixion, means for removing the stop-arm from the path of the cakes, means connected with the carrier for icing the cakes, means connected with the carrier for turning the cakes to even the icing, means for removing the cakes from the forks, and means connected with the carrier for washing the forks after the removal of the cakes.

2. In apparatus of the class described and in combination, a cake-carrier comprising a plurality of parallel endless belts, bars connecting the belts at spaced intervals, cake-transfixing forks arranged longitudinally of the bars and spaced apart from each other, means for continuously moving the carrier, means connected with the carrier for icing the cakes, means connected with the carrier for turning the cakes whereby to even the icing, means for presenting the cakes for transfixion by the forks comprising an endless belt, means for supporting the cakes during transfixion by the forks, means for removing the cakes from the forks at the end of the series of operations, and means connected with the carrier for washing the forks after the removal of the cakes.

3. In apparatus of the class described and in combination, a receptacle for containing icing, means for passing the cakes therethrough comprising a flexible endless carrier having connected therewith a plurality of cake-transfixing forks, comprising each a base secured to the carrier, and arms projecting therefrom, the ends of the said arms being pointed and bent in the direction of travel of the carrier, means for moving the carrier continuously, means for placing the cakes upon the forks, means connected with the carrier for evening and drying the icing upon the cakes, means for removing the completed cakes from the forks, comprising a pusher-bar for engaging the cakes, means for moving said bar in the direction of travel of the carrier and at a higher rate of speed, means for receiving the cakes, and means connected with the carrier for washing the forks after the removal of the cakes.

4. In apparatus of the class described and in combination, a receptacle for an icing mixture, means for passing the cakes therethrough, comprising a flexible endless carrier, provided with cake-transfixing forks, said forks extending in the direction of travel of the carrier, means for placing the cakes upon the forks, means for continuously moving the carrier, means connected with the carrier for evening and drying the icing upon the cakes, and means for removing the cakes from the forks, comprising a push-bar moving in the direction of travel of the carrier and at a higher rate of speed, and means for moving said bar.

5. In apparatus of the class described and in combination, a cake-carrier comprising a plurality of parallel endless belts, bars connecting the belts at spaced intervals, cake-transfixing forks arranged longitudinally on the bars, and spaced apart thereon, means for moving the carrier, means for presenting cakes for transfixion by the forks, means for supporting the cakes during transfixion, means connected with the carrier for icing the cakes during the movement thereof, means for turning the cakes whereby to even the icing, and means for removing the cakes from the forks.

6. In apparatus of the class described, and in combination, a carrier provided with a plurality of cake-transfixing forks, means for continuously moving the carrier, means for presenting cakes to the forks, means for supporting the cakes during transfixion, means connected with the carrier for icing the cakes while transfixed by the forks, means connected with the carrier for turning the cakes whereby to even the icing, and means for removing the cakes from the forks.

7. In apparatus of the class described and in combination, a traveling carrier, a plurality of cake-transfixing forks upon the carrier, means connected with the carrier for icing the cakes upon the forks, means for removing the cakes from the forks, and means connected with the carrier for washing the forks after the removal of the cakes.

8. In apparatus of the class described and in combination, a receptacle for an icing mixture, means for passing cakes therethrough comprising a carrier provided with cake-transfixing forks, and means beyond the receptacle for removing the cakes from the forks.

9. In apparatus of the class described, and in combination, a traveling carrier, means

for moving the carrier, a plurality of cake-transfixing forks upon the carrier, means for supporting the cakes during transfixion by the forks, means connected with the carrier for icing the cakes, means connected with the carrier for evening the icing upon the cakes, and means for removing the cakes from the forks.

10. In apparatus of the class described and in combination, a traveling carrier, means for moving the carrier, a plurality of cake-transfixing forks upon the carrier, means for presenting the cakes to the forks, means connected with the carrier for icing the cakes, and means for removing the cakes from the forks.

11. In apparatus of the class described and in combination, a traveling carrier for supporting cakes, means connected with the carrier for icing the cakes while supported thereon, means connected with the carrier for turning the cakes whereby to even the icing, means for removing the cakes from the carrier, and means for continuously moving the carrier.

12. In apparatus of the class described, and in combination, a traveling carrier, means for presenting cakes to the carrier, means on the carrier for transfixing the cakes, means connected with the carrier for icing the cakes, means connected with the carrier for rotating the cakes whereby to even the icing, means connected with the carrier for drying the cakes, and means for removing the cakes from the carrier.

13. In apparatus of the class described, and in combination, a traveling carrier, means on the carrier for supporting the cakes, means connected with the carrier for icing the cakes, means connected with the carrier for rotating the cakes whereby to even the icing, means connected with the carrier for drying the cakes, and means for removing the cakes from the carrier.

14. In apparatus of the class described and in combination, a traveling carrier, for supporting cakes, means for icing the cakes while supported by the carrier, and means moving with the carrier and at a higher speed for engaging and removing the cakes from the carrier.

15. In a cake-icing machine, the combination with a receptacle for the icing mixture, of an endless carrier for carrying the cakes therethrough, and comprising a plurality of parallel endless belts having one run traversing the receptacle, bars connecting the belts at spaced intervals, and a plurality of cake-transfixing forks arranged at spaced intervals longitudinally of the bars, each of said forks comprising a base connected to the bar, and arms extending outwardly from the base, said arms having their ends pointed and bent in the direction of travel of the carrier.

16. In a cake-icing machine, the combination with a receptacle for an icing mixture, of an endless carrier for carrying the cakes through the receptacle, comprising a plurality of parallel belts, connected at spaced intervals by bars, and a plurality of cake-transfixing forks arranged longitudinally of the bars and spaced apart from each other.

17. In a cake-icing machine, the combination with a receptacle for an icing mixture, of an endless carrier for carrying the cakes therethrough, said carrier being provided with forks for transfixing the cakes whereby to support them in their travel.

18. In a cake-icing machine, the combination with the receptacle for the icing mixture, of means for passing the cakes through the receptacle comprising a flexible endless carrier provided with supporting-forks, and means for constraining the carrier to travel in a plurality of series of relatively short horizontal parallel lines after leaving the receptacle whereby to turn the cakes to even the icing thereon.

19. In a cake-icing machine, the combination with the receptacle for the icing mixture, of means for passing the cakes through the receptacle comprising a flexible endless carrier provided with cake-supporting means, and means for constraining the carrier to travel in a plurality of series of relatively short parallel lines after leaving the receptacle whereby to even and dry the icing upon the cakes.

20. In a cake-icing machine, the combination with the receptacle for an icing mixture, of means for passing the cakes therethrough, comprising a flexible endless carrier provided with cake-supporting means, and a plurality of series of means beyond the receptacle for reversing the direction of travel of the carrier at relatively short intervals whereby to dry and even the icing upon the cakes.

21. In apparatus of the class described and in combination, a traveling carrier provided with cake-transfixing forks, means for presenting the cakes in the path of the forks, and means for supporting the cakes during transfixion.

22. In apparatus of the class described and in combination, a traveling carrier provided with cake-transfixing forks, means for presenting the cakes in the path of the forks, means for supporting the cakes during transfixion, and means for removing said supporting means from the path of the forks after transfixion.

23. In apparatus of the class described and in combination, a traveling carrier provided with cake-transfixing forks, means for placing the cakes on the forks, and means moving with the carrier and at a higher rate of speed for engaging the cakes and removing them from the forks.

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