Jan. 29, 1924. 1,481,813

C. R. TAYLOR

CONE ROLLING MACHINE

Filed Feb. 16, 1921 2 Sheets-Sheet 1

Fig. 1.

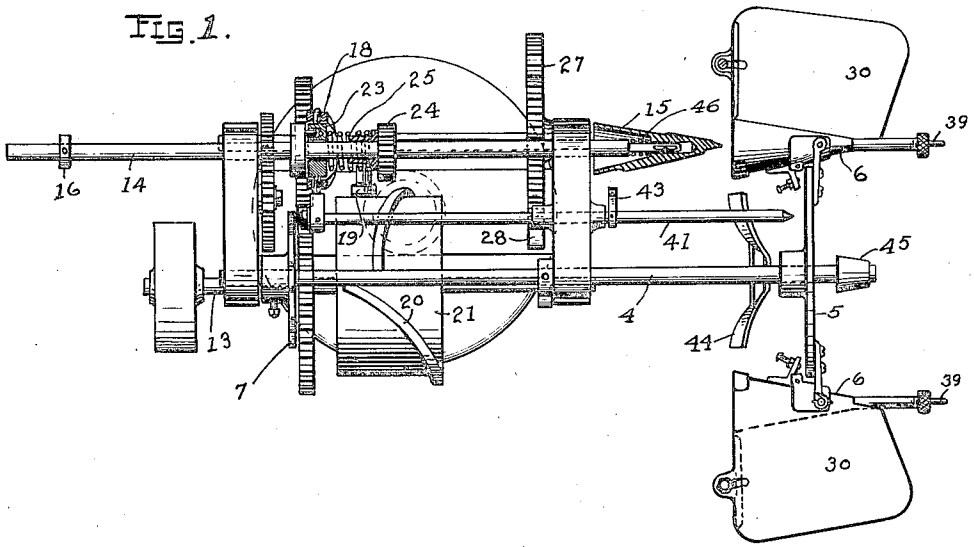
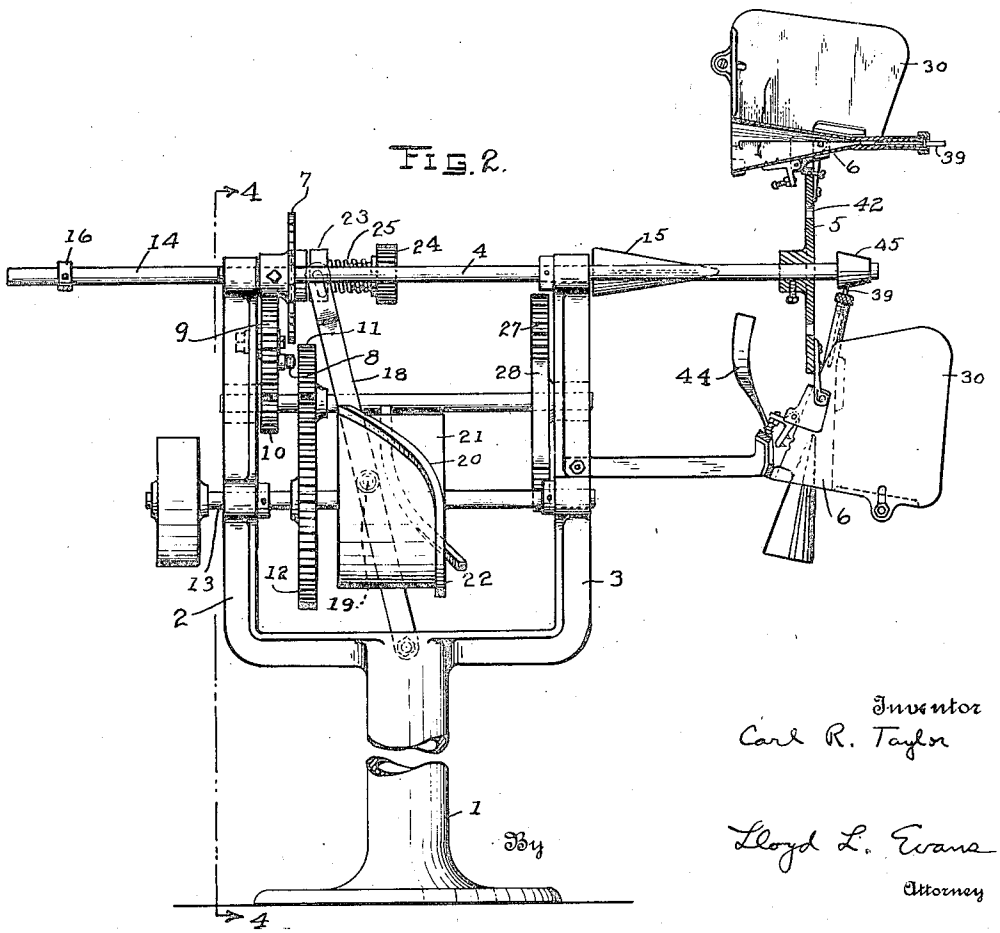


Fig. 2.



Inventor
Carl R. Taylor

Lloyd L. Evans
Attorney

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Fig. 4.

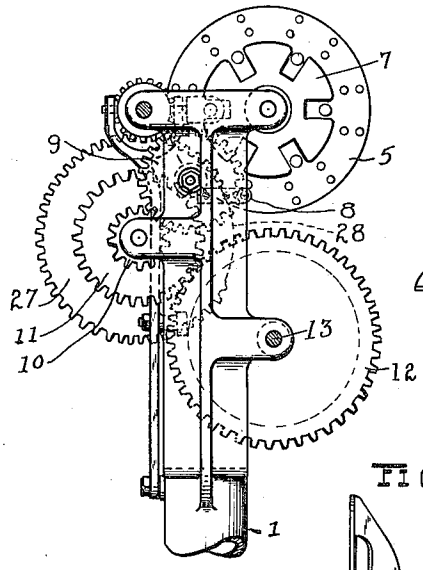


Fig. 5.

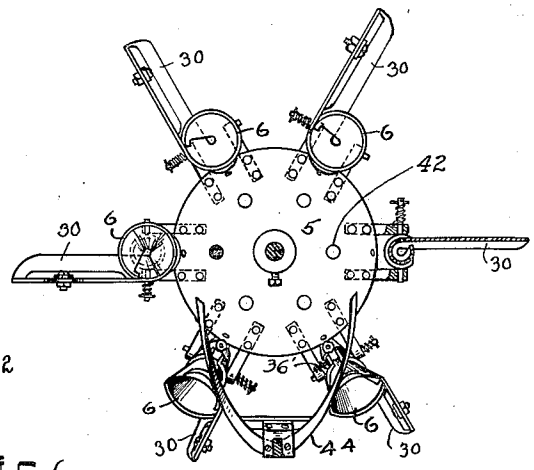


Fig. 6.

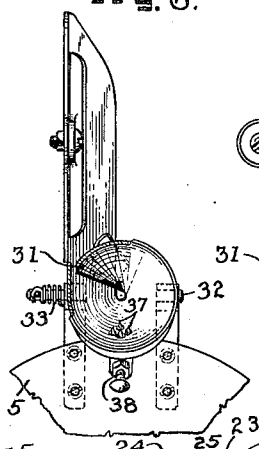


Fig. 7.

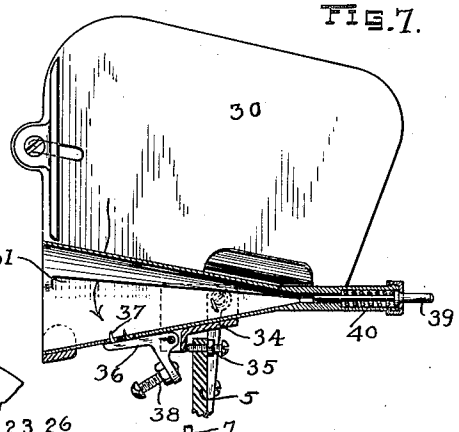
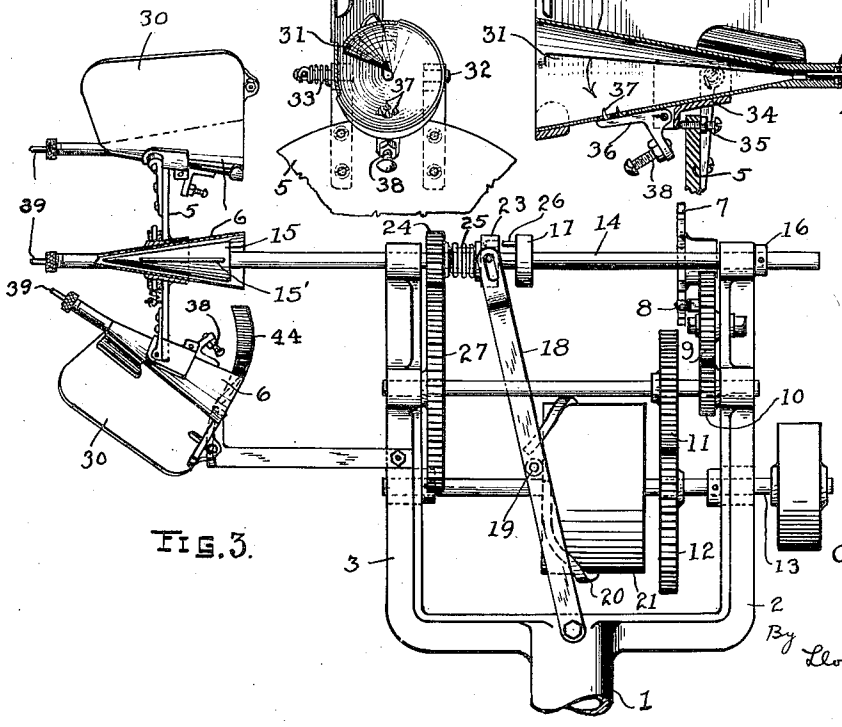


Fig. 3.



Inventor
Carl R Taylor
By Lloyd L. Evans
Attorney

Patented Jan. 29, 1924. 1,481,813

UNITED STATES PATENT OFFICE.

CARL R. TAYLOR, OF CLEVELAND, OHIO.

CONE-ROLLING MACHINE.

Application filed February 16, 1921. Serial No. 445,294.

To all whom it may concern:

Be it known that I, CARL R. TAYLOR, a citizen of the United States, and a resident of Cleveland, Ohio, have invented certain new and useful Improvements in Cone-Rolling Machines, of which the following is a specification.

This invention relates to machines for forming thin freshly baked wafers while still hot into cone shaped containers such as are commonly used in dispensing ice cream.

Generally, the object of this invention is to provide a machine capable of more efficiently forming cone shaped containers from flat wafers.

More particularly, one object of this invention is to provide a machine capable of forming such cones and retaining them in the forming dies for a sufficient length of time to permit them to cool and harden.

A further object is to provide means for positively engaging the formed cones to hold them in the dies, said means being releasable to permit discharge.

A further object is to provide means for positively ejecting the formed cones when cooled.

A further object is to provide mechanism for bringing a single rotating mandrel into engagement successively with a series of wafer forming dies so that sufficient time may elapse between the formation of successive cones in the same die for the cooling of the formed cones.

A further object is to provide means for accurately positioning and fixedly holding the successive dies in operative relation to the mandrel.

A further object is to provide means for controlling the rotation of the mandrel so that it does not begin to rotate until fully entered into the die whereby the wafer is engaged throughout its whole length and is wrapped evenly about the mandrel.

A further object is to provide driving means for the mandrel which automatically discontinues the rotation thereof prior to the withdrawal from the die so that the mandrel does not injure the formed cone.

Other objects will appear from the following description and drawings hereto annexed.

Figure 1 is a top plan view of the machine showing the mandrel, and the shaft shifting and locking collar in section.

Fig. 2 is a side elevation of the machine showing the mandrel in non-engaging position and one of the dies in discharging position, one of the dies and the die carrying disk being shown in section.

Fig. 3 is a side elevation of the machine as viewed from the side opposite to that on which Fig. 2 is taken, showing the mandrel engaged with a die.

Fig. 4 is a section taken on line 4—4 of Fig. 2, showing the operating gear train in side elevation.

Fig. 5 is a view in elevation of the carrier disk and dies carried thereby from the side facing the mandrel, showing a section of one of the dies in the plane of the disk and showing the die tilting and cone releasing cam.

Fig. 6 is a detail view showing one of the dies, the feed apron therefor, and the connection between the die and disk.

Fig. 7 is a sectional view showing the cone engaging claws and the knockout pin.

In use, the machine shown herein is set up adjacent the batter baking machine upon which the thin wafers which are formed by this machine into cones, are baked.

The whole machine is supported upon a pedestal 1, carrying a pair of upright shaft supports 2 and 3. In the upper ends of the supports 2 and 3 is journaled the carrier supporting shaft 4, which has the carrier disk 5 fixed upon the outer end thereof. Upon the disk 5 are pivotally mounted a series of hollow conical dies 6.

The shaft 4 has fixed thereto on its opposite end a star wheel 7 which is intermittently engaged by a pin 8 carried by and projecting laterally from a gear wheel 9, mounted on a stub shaft fastened on support 2. The gear 9 is driven through gears 10, 11 and 12 from the drive shaft 13. A step by step rotative movement is thus imparted to the shaft 4 and carrier 5.

Slidably mounted upon the upper ends of supports 2 and 3 is a sliding shaft 14 carrying a conical mandrel 15 at the forward end thereof. Stop collars 16 and 17 pinned to the shaft 14 and engageable with the support 2 limit the forward and backward sliding movement of the mandrel carrying shaft. The mandrel 15 has one or more longitudinal ribs 15′ for more positive engagement with the wafers.

The mandrel shaft is moved backward and forward by means of a swinging actuating lever 18 pivoted to the supporting

pedestal, and having a pin 19 intermediate the ends thereof, engageable with cam track 20 upon a drum 21 carried by drive shaft 13. The cam track has a dwell portion 22 which serves to hold mandrel in engagement with the dies for a sufficient time to form a cone, the two sections of the cam track being arranged to impart the forward and return movement to the lever 18.

Upon the shaft 14 is slidably mounted a collar 23 to which is pivotally connected the upper end of lever 18. In advance of the collar 23 a small spur gear 24 is fixed on the shaft. Interposed between the collar 23 and the gear 24 is a coil spring 25. The coil spring normally holds the collar 23 back against the fixed collar 17, and fixed collar 17 has a pin 26 engageable with a slot in the collar 23 whereby the shaft 17 is normally held against rotation.

Mounted upon a countershaft actuated from the drive shaft 13 through gears 11 and 12 is a large gear 27 having a stripped portion 28. The toothed portion of the gear 27 is adapted to mesh with the gear 24 when the mandrel shaft is in extreme forward position; i. e. when the mandrel engages the die. The movement of the actuating lever 18 is so timed with respect to the movement of gear 27 that the gear 24 slips sidewise over the stripped portion 28 and when the lever begins its movement in the opposite direction the stripped portion of gear 28 is again beneath gear 24.

The dies 6 each have a laterally extending shelf or apron 30 integral therewith communicating with the hollow conical part of the dies by means of a slot 31. The dies 6 are connected to the disk 4 by means of pivots 32 and are normally held with their axis horizontal by means of springs 33. Stops 34 on the dies engage set screws 35 on the disk. The set screws serve to line up the various dies with the axis of the mandrel. For engaging and holding a formed cone in the die a pivoted dog 36 is provided, having prongs 37 projecting through the wall of the die, a spring 36′ (see Fig. 5) normally holding the dog 36 against the die with the prongs 37 projecting through the wall, and a trip arm 38 by means of which the dog is swung to bring the prongs out of engaging position. Projecting through the small end of each die is a plunger 39 normally held in retracted position by a spring 40.

Attached to the collar 23 and movable with the mandrel shaft 14 is a positioning and locking pin 41 having a tapered point engageable with any one of a series of perforations 42 in the disk 5. The pin 41 carries a fixed lug 43 which engages the trip arm 38 of dog 36 to withdraw the prongs 37 from the die as the mandrel moves into the die.

Adjacent the lower edge of disk 4 is a cam track 44 engageable with the trip arm 38 of dog 36 of each of the dies successively on rotation of the disk 5 and serving to swing the dog 36 to release the cone and also to swing the die about its pivot 32 against the action of spring 33 to turn the open end of the die down to discharge the cone.

Upon the end of shaft 4 is fixed a cone 45. As the die is swung about its pivot to bring the open end down the ejector pin 39 engages the cone 45 and is moved in against the spring 40 to positively eject the formed cone from the die.

The conical mandrel 15 is yieldingly cushioned on the outer end of shaft 14 by means of a small spring 46.

Operation.

As the intermittent movement of the die carrier brings each die opposite the mandrel, a hot wafer is placed upon the apron 30 of the die with the edge thereof extending through the slot 31 into the interior of the die. As the carrier comes to rest the mandrel shaft is slid forward by means of the cam actuated arm 18 and the tapered pin 41 moving therewith enters a perforation 42, positioning and holding the carrier disk against any displacement during the forming operation. As the mandrel enters the die the lug 43 on pin 41 engages trip arm 38 of the dog 36 to withdraw the prongs 37 from the die so as to offer no resistance to the rotative movement of the hot wafer against the inner surface of the die.

As the mandrel engages the die, gear 24 slides over the stripped portion of gear 27, causing gear 24 to mesh with gear 27 to rotate the mandrel to engage the edge of the hot wafer and roll it into conical shape within the die. Springs 25 and 46 permit the mandrel to yield with respect to the die sufficiently to accommodate wafers of different thicknesses and to move back slightly as the wafer is drawn into the die.

By the above described arrangement the mandrel is fully engaged before it begins to rotate. This enables the mandrel to get a more evenly distributed and uniform grip upon the edge of wafer to pull it in and roll it up inside the die.

When the stripped portion of the gear 27 has again come under the gear 24 the lever 18 begins its movement in the opposite direction to withdraw the mandrel. Thus the mandrel stops rotating just before it is withdrawn from the die avoiding injury to the formed cone therein.

The lever 18 at the beginning of its retracting movement does not move the shaft 14 with it until after the collar 23 has moved far enough on shaft 14 to release the pressure on the spring 25, which connects collar

23 with the gear 24 and begins to exert a tension thereon. The pin 41 being directly connected with the collar 23 moves with the lever 18 and therefore the lug 43 is withdrawn from the trip arm 38 of the dog 36, permitting the dog to swing in under the influence of its spring bringing the claws 37 into engagement with the formed cone before the mandrel begins to move out of the die.

Continued movement of the lever 18 withdraws the mandrel 15 from the die and the pin 41 from the perforation in the disk 5, releasing the carrier for further movement. The pin 8, when the mandrel 15 and pin 41 are clear of the carrier, again engages star wheel 7 to move the die carrier 5 forward one step to bring a second die into alinement with the mandrel.

As each die approaches the bottom position, the arm 38 of the cone clamping dog 36 engages the fixed cam track 44 which swings the die about its pivot against the action of spring 33 turning the die open end down and simultaneously swinging the dog 36 about its pivot to withdraw the cone engaging claws 37 and free the cone. As the axis of the die approaches the vertical position the ejector pin 39 strikes the cone 45 and is thereby forced in against the small end of the formed cone to positively eject it from the die. Further movement of the carrier brings the die adjacent the return position of the cam 44 against which the die is pressed by the spring 33 and gradually returns to its normal position with its axis substantially parallel to the axis of the disk ready to be moved into alinement with the mandrel 15.

The retention of the formed cones in the dies while several other cones are being formed gives the hot wafer time to cool and harden in the die so that it will permanently hold its conical shape and can be safely handled.

Having described my invention, what I claim is:

1. In a cone rolling machine, a conical mandrel, a forming die adapted to receive the mandrel, means for stationarily supporting the die in alinement with the mandrel; means for shifting the mandrel into engagement with the die and means controlled by said shifting means to rotate the mandrel when in engagement with said die.

2. In a cone rolling machine, a conical mandrel, a forming die, means for engaging and disengaging said mandrel and die, means for rotating said mandrel while in engagement with the die and means for locking said mandrel against rotation while out of engagement with the die.

3. In a cone rolling machine, a shaft, a conical mandrel carried upon the end thereof, a forming die, means for supporting said die in alinement with the mandrel, means for shifting said shaft to bring the mandrel into engagement with the die and yielding means interposed between said shifting means and said shaft.

4. In a cone rolling machine, a shaft, a conical mandrel, carried upon the end of the shaft, a forming die, means for supporting the die in alinement with the mandrel, a collar slidably mounted upon the shaft, a yieldable connection between the collar and shaft, means for holding the collar against rotation and for shifting the same to move the mandrel into engagement with the die, means carried by the shaft and engageable with the collar to lock the shaft against rotation, means for rotating the shaft and means carried by the shaft and engageable with the rotating means when the mandrel engages the die, said yieldable connection permitting said locking means to be disengaged from said collar on engagement of the mandrel with the die.

5. In a cone rolling machine, a stationary support, a conical mandrel carried thereby, means for rotating said mandrel, a carrier having a plurality of forming dies adapted to receive the conical mandrel, means for alternately moving said carrier to bring said dies successively into axial alinement with said mandrel and shifting said mandrel axially into engagement with the successive dies.

6. In a cone rolling machine, a stationary support, a conical mandrel carried thereby, a carrier, having a plurality of forming dies adapted to receive the conical mandrel, periodically actuated means for moving the carrier to bring the dies into axial alinement with the mandrel, means operable while the said moving means is inactive to shift the mandrel axially into engagement with the die and means movable with the mandrel and engageable with the carrier to positively position and hold the same during the cone forming operation.

7. In a cone rolling machine, a movable carrier, a series of cone forming dies thereon, said dies adapted to receive wafers, rotating means engageable with said dies successively to form the wafers into cones, means for retaining successively formed cones in a plurality of said dies.

8. In a cone rolling machine, a movable carrier, a series of cone forming dies thereon, said dies adapted to receive wafers, rotating means engageable with said dies successively to form the wafers into cones, means for retaining successively formed cones in a plurality of said dies and means for successively discharging the formed cones from said dies.

9. In a cone rolling machine, a hollow conical die adapted to receive a wafer, a mandrel engageable with the wafer within

the die to form the wafer into a cone, and means carried by the die and engageable with a formed cone therein to retain the formed cone in the die.

10. In a cone rolling machine, a hollow conical die adapted to receive a wafer, a shiftable mandrel engageable with the wafer within the die to form the wafer into a cone, movable cone engaging means carried by the die, and means movable with the shiftable mandrel for holding said engaging means out of engagement while the mandrel is in engagement with the die.

11. In a cone rolling machine, a hollow conical die, a mandrel engageable and disengageable with said die to form a pastry cone therein, means carried by the die operable upon movement of the mandrel out of the die to positively engage the formed cone to prevent displacement thereof from the die, means for moving the die and means engageable with said cone engaging means to move it out of engagement with the formed cone to release the cone from the die.

12. In a cone rolling machine, a hollow conical die, adapted to have a wafer inserted therein, means cooperating with said die to form said wafer into a cone and means engageable with the formed cone for ejecting said cone from the die.

13. In a cone rolling machine, a carrier, a series of hollow conical dies carried thereby, adapted to receive wafers, means engageable with said dies adapted to form said wafers into cones, means carried by the dies for positively engaging the formed cones to retain them in the die, means carried by the die movable to positively eject the formed cones therefrom and means to simultaneously release said cone engaging means and actuate said ejecting means.

14. In a cone rolling machine, a die carrying disk, a series of conical cone forming dies pivotally mounted upon the disk, means for intermittently moving said disk about its axis, means engageable with the dies successively to roll wafers therein into conical form, means engageable successively with the dies to swing them about their pivots to dis harge formed cones therefrom.

15. In a cone rolling machine, a die carrying disk, a series of conical cone forming dies pivoted to the disk, means for imparting intermittent rotative movement to the disk, means engageable with the dies successively to roll sheets of pastry therein into conical form, means engageable successively with the dies to swing them about their pivots, means carried by the dies for positively ejecting the formed cones and means operable upon movement of the dies about their pivots to actuate said ejecting means.

16. In a cone forming machine, a die carrying disk, a series of conical cone forming dies pivoted to the disk, means for rotating the disk, means cooperating with the dies to form conical pastry cones therein, means carried by the die for engaging a formed cone to retain it in the die, means engageable with the dies successively to swing them about their pivots and simultaneously release said cone engaging means, and means operable upon said swinging movement of the dies to directly engage and positively eject the formed cones from the dies.

17. In a cone rolling machine, a cone forming die, a moveable means carried thereby, having a cone engaging member to hold the cone in the die.

18. In a cone rolling machine, a cone forming die, a spring pressed dog pivoted upon the outside thereof, having a cone engaging claw normally projecting through the wall of the die.

19. In a cone rolling machine a shiftable conical mandrel, a movable carrier, a plurality of forming dies thereon, means for moving the carrier to bring the dies successively into alinement with the mandrel, a perforation in the carrier adjacent to each of the dies, means for shifting the mandrel, and a tapered positioning pin movable with the mandrel and engageable with the perforations to align the dies with respect to the mandrel.

20. In a cone rolling machine, a forming die, a shaft, means for holding the die in axial alinement with the shaft, a conical mandrel yieldingly mounted upon the shaft and means for shifting said shaft to move the mandrel into and out of engagement with the die.

21. In a cone rolling machine, a forming die, a mandrel, means for engaging and disengaging said die and mandrel, and means for starting the rotation of the mandrel after the mandrel is in engagement with the die and stopping the rotation before the disengagement thereof.

22. In a cone rolling machine, a forming die, a mandrel, means for engaging and disengaging said die and mandrel, means for starting the rotation of the mandrel after the mandrel is in engagement with the die and stopping the rotation before the disengagement thereof and means for clamping the formed cone in the die operable before the disengagement of the mandrel and die and after the mandrel has stopped rotating.

In testimony whereof, I hereunto affix my signature.

CARL R. TAYLOR.