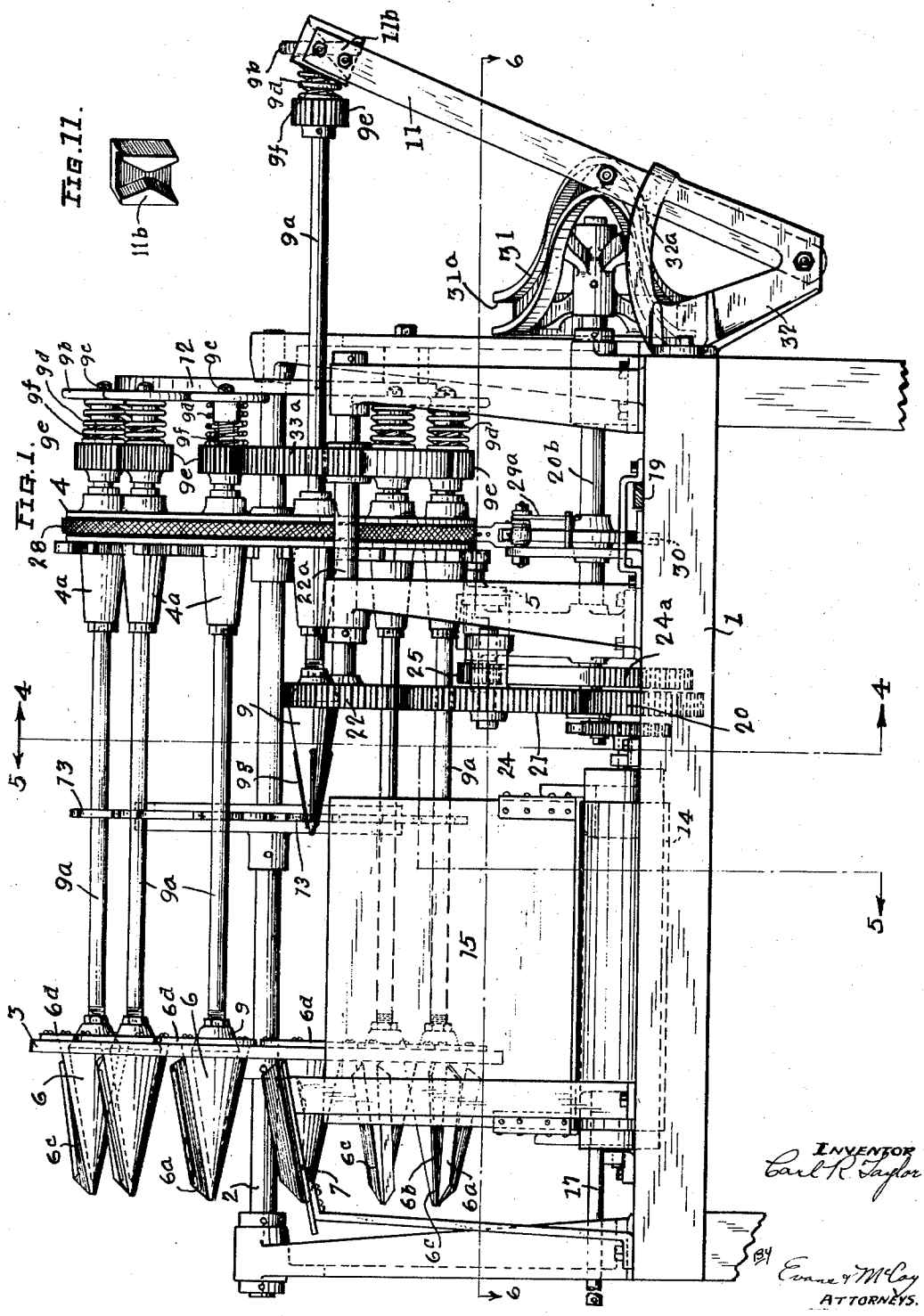
July 9, 1929. C. R. TAYLOR 1,720,304

CONE ROLLING MACHINE

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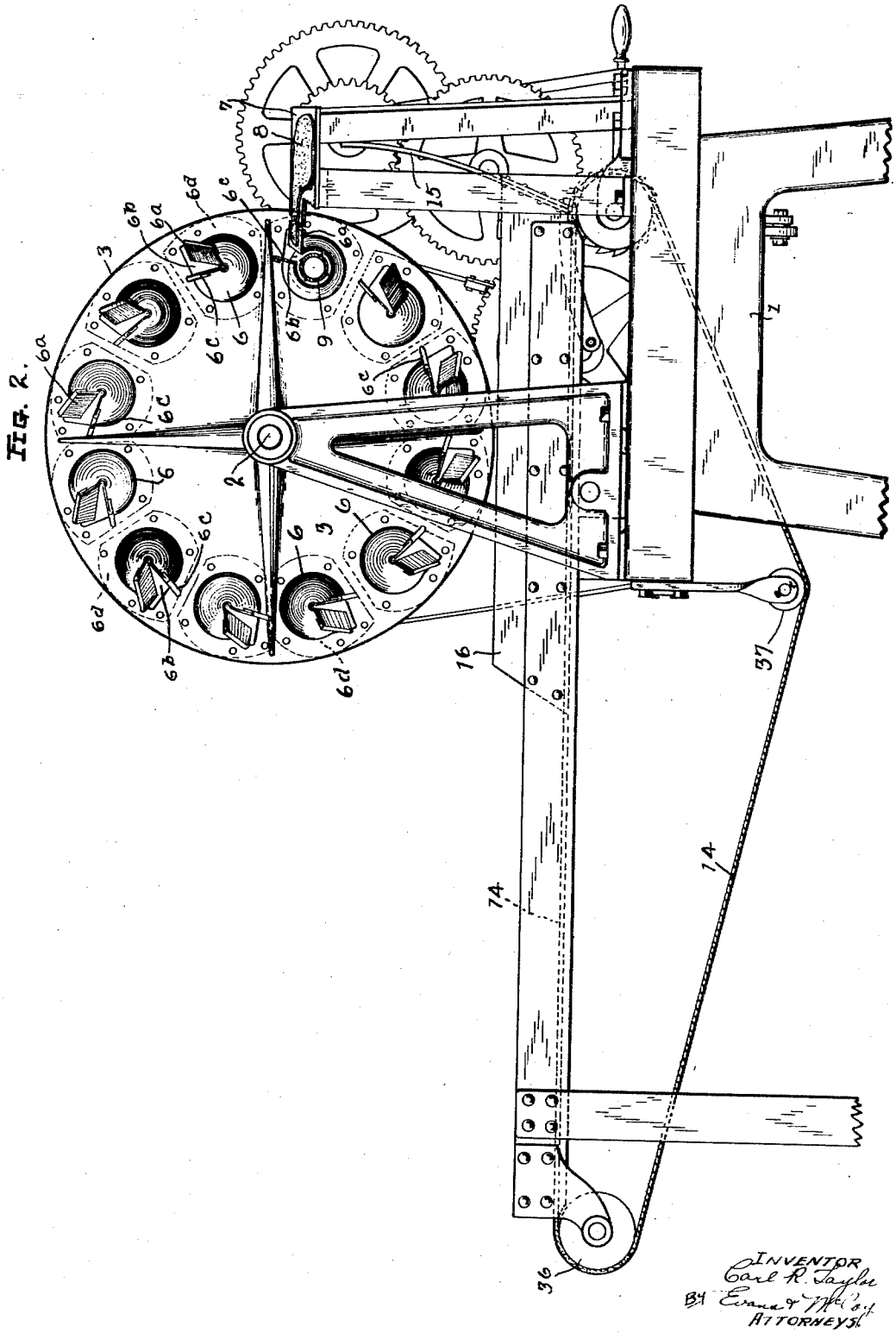


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CONE ROLLING MACHINE

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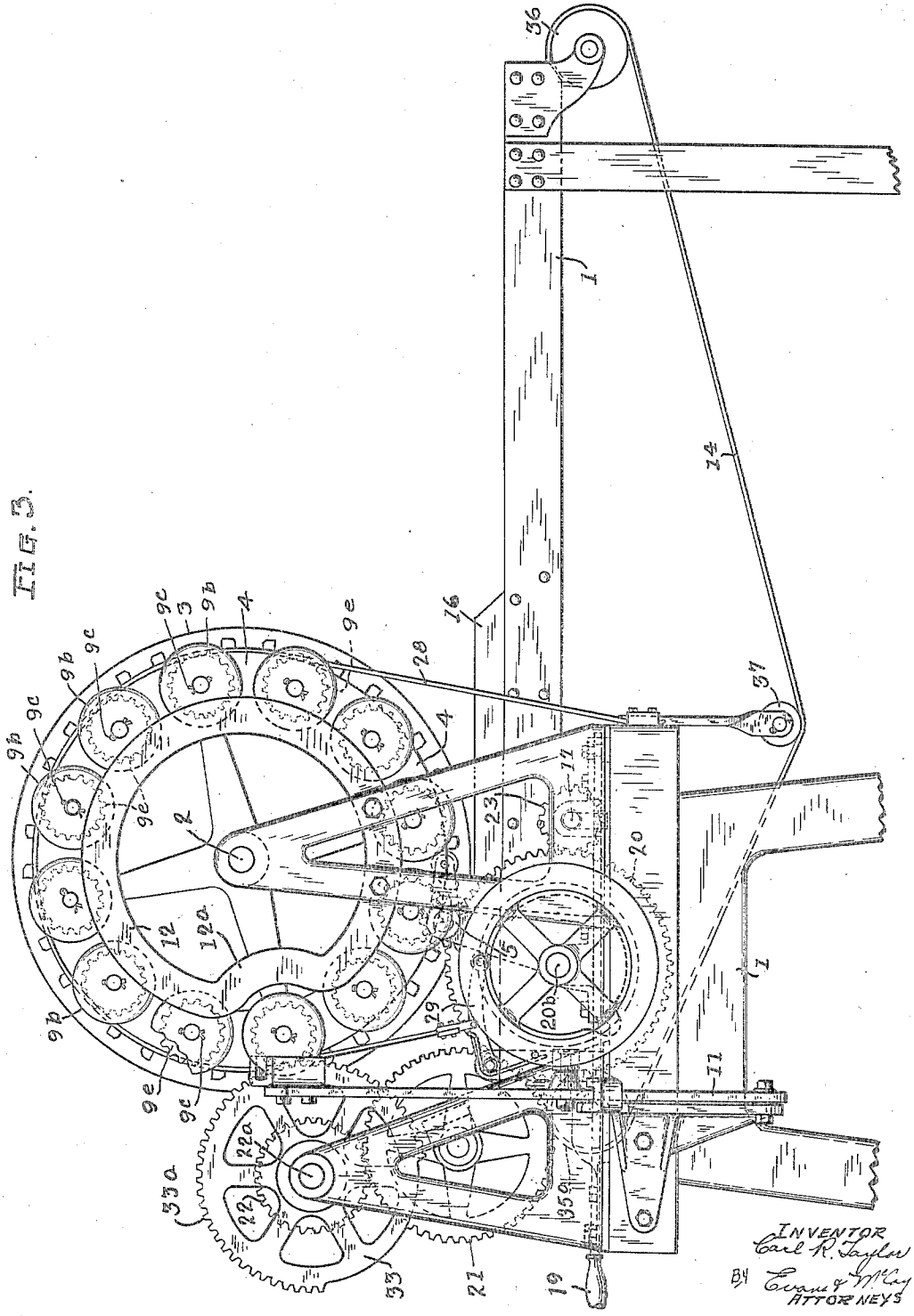


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CONE ROLLING MACHINE

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FIG. 3.



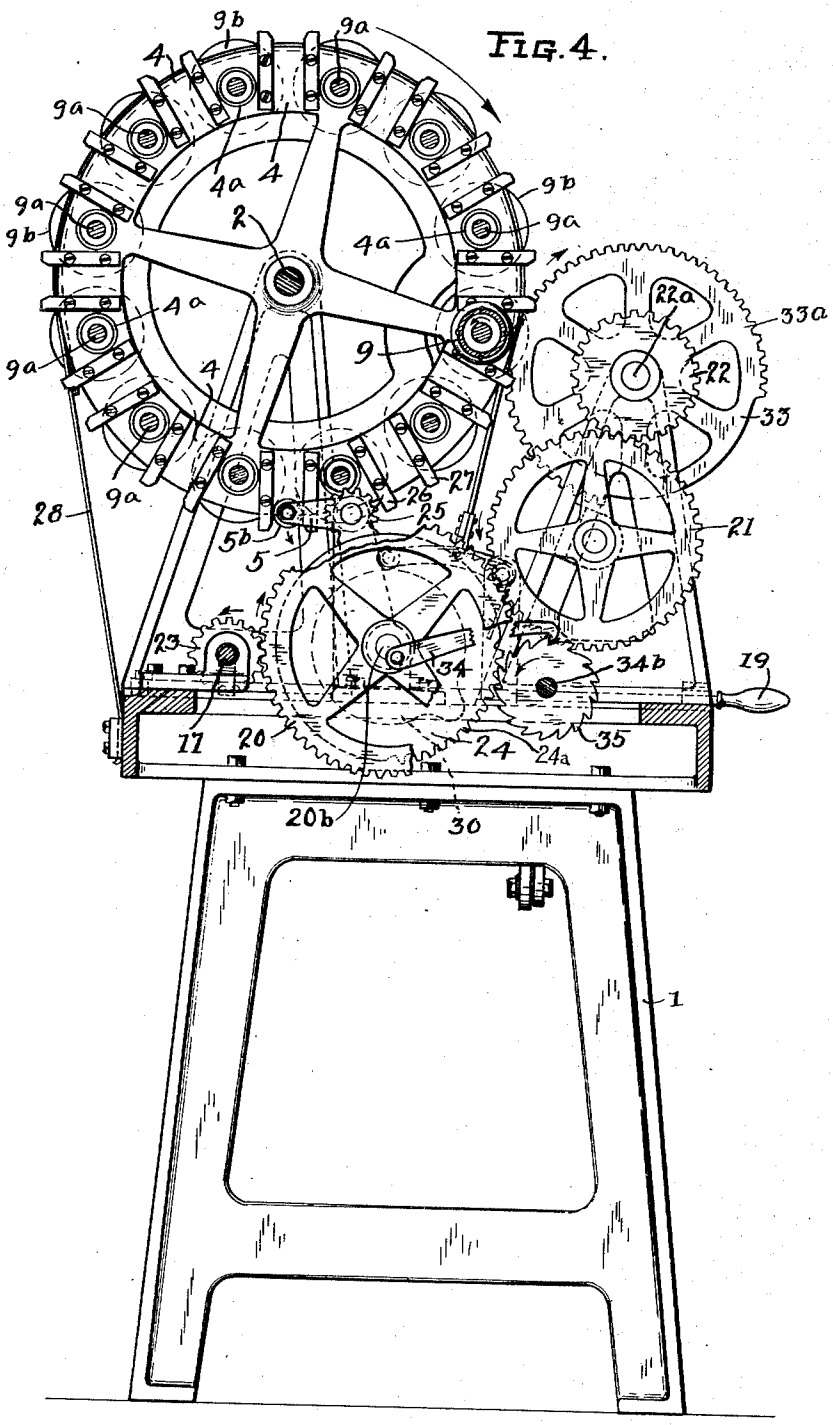
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CONE ROLLING MACHINE

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FIG. 4.

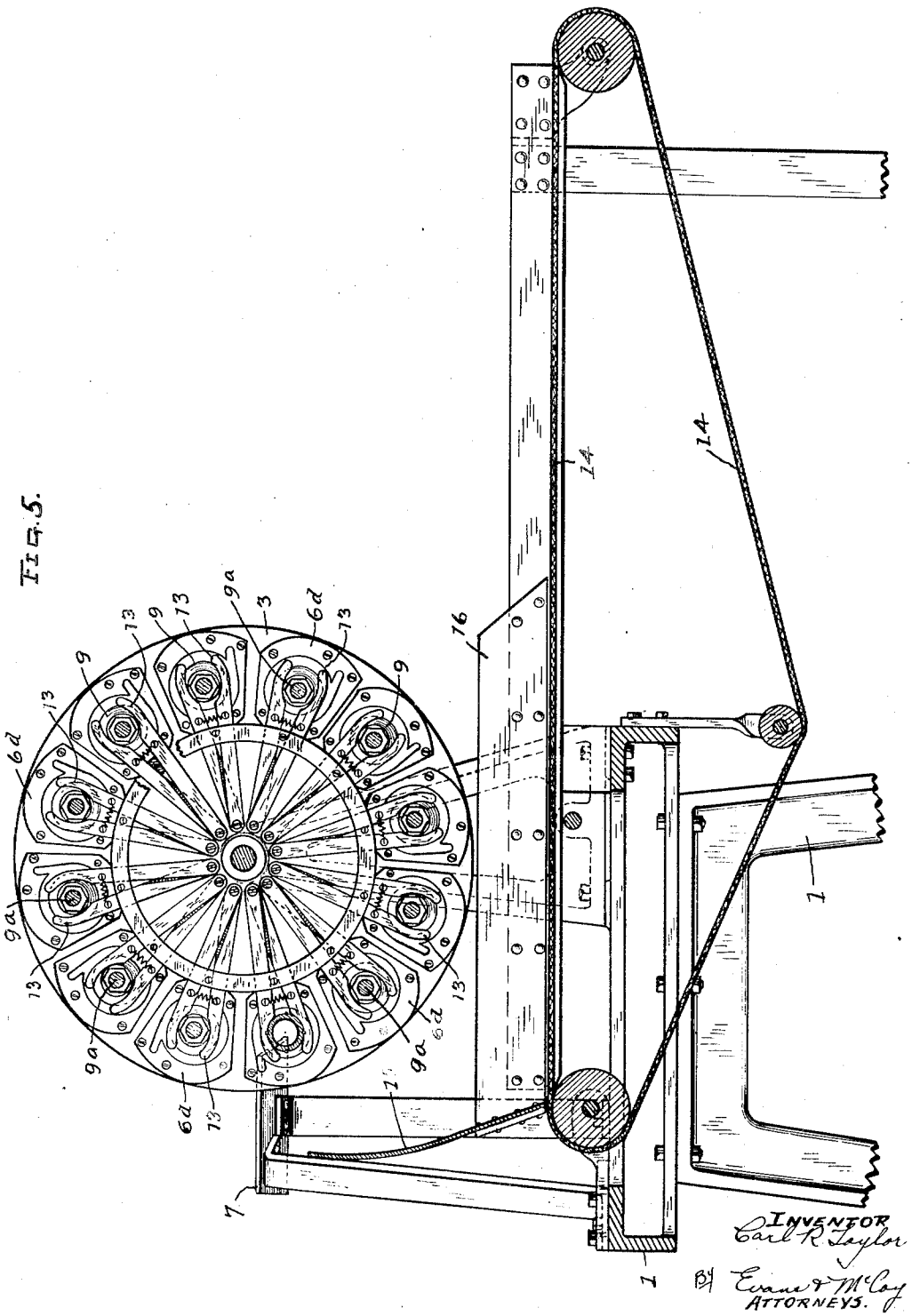


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CONE ROLLING MACHINE

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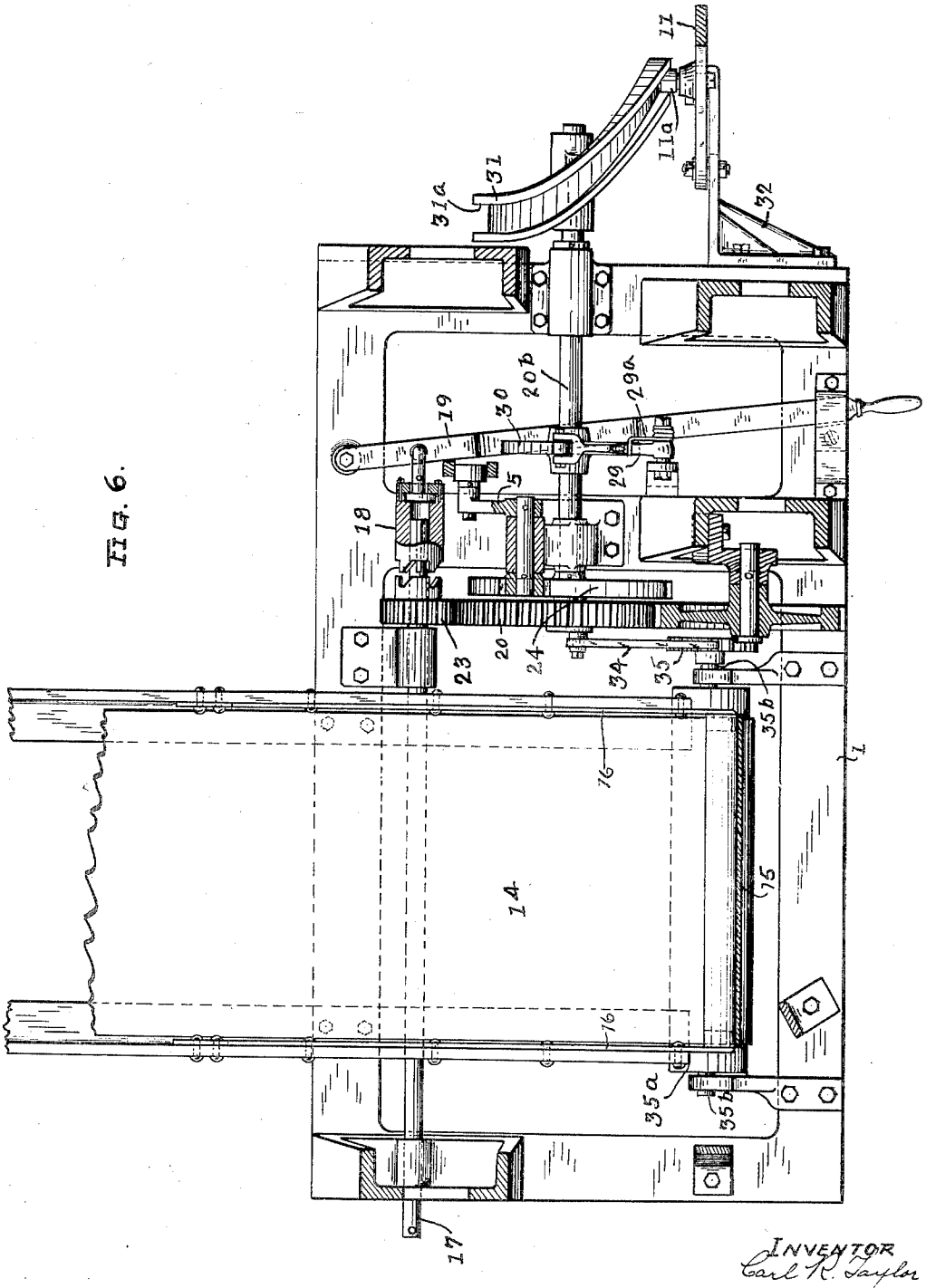


FIG. 6.

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CONE ROLLING MACHINE

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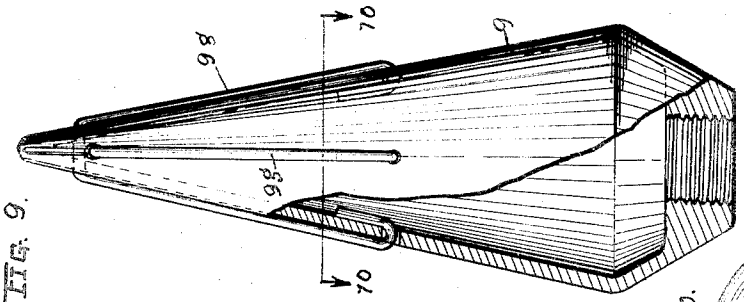


FIG. 9.

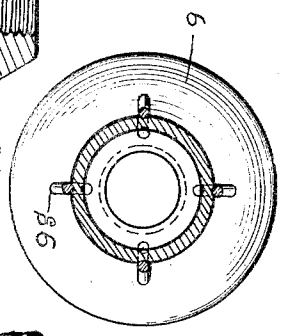


FIG. 10.

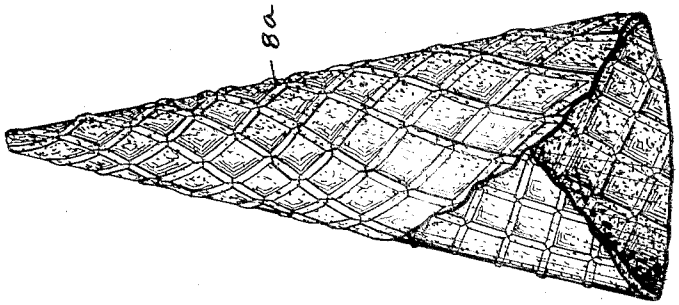


FIG. 8.

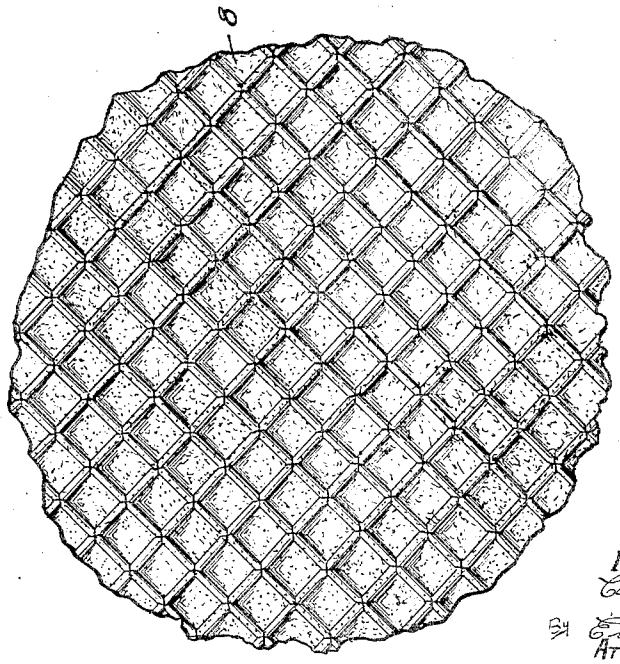


FIG. 7.

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UNITED STATES PATENT OFFICE.

CARL R. TAYLOR, OF CLEVELAND, OHIO.

CONE-ROLLING MACHINE.

Application filed October 30, 1926. Serial No. 145,132.

This invention relates to cone rolling machines and particularly to machines for forming hot, freshly baked wafers of pastry into cones suitable for use as containers of ice cream.

In general, the object of the invention is to provide a machine of relatively compact and inexpensive structure that can be used in conjunction with the most rapidly operating commercial type of cake baking or wafer baking machine now in use and be so timed in its operation as to immediately receive each freshly baked wafer from the baking machine and forthwith permanently form the wafer into a conical container.

A further object of the invention is to provide a rapidly operating high capacity machine capable of holding the formed wafers in a mold under regulated pressure for a sufficient period of time to insure proper cooling and hardening or setting of the cakes in the desired conical form.

A further object of the invention is to provide suitable mechanism for positively controlling the operation of a series of molds or dies and cooperating mandrels therefor, so that the pairs of dies and mandrels will be moved successively to an ejecting and loading position where the mandrel is withdrawn from the die to eject the formed cone and is then reinserted into the die, rotated to form a new cone, and held in pressure imposing position within the die until the cone has had ample time to cool and harden before it is ejected.

An additional object of the invention is to provide mechanism capable of positive, rapid and unerring operation, the specific features of which will be apparent from a consideration of the accompanying specification and drawings wherein:

Figure 1 is a side elevational view of a preferred embodiment of the invention.

Fig. 2 is a front end elevational view of the machine shown in Fig. 1.

Fig. 3 is a rear end elevational view of the machine.

Fig. 4 is a sectional elevational view taken substantially on line 4—4 of Fig. 1 and looking in the direction of the arrows toward the rear of the machine.

Fig. 5 is a sectional elevational view, taken substantially on line 5—5 of Fig. 1 and looking toward the front of the machine in the direction of the arrows.

Fig. 6 is a horizontal sectional view of the machine looking in the direction of the arrows 6—6.

Fig. 7 shows a cake or wafer of pastry or other material in condition to be operated on by the machine.

Fig. 8 is a side view of a cone, formed in the machine from a cake or wafer of the character shown in Fig. 7.

Fig. 9 is a side elevational view, shown partially in section with parts broken away, of one of the mandrels used in the machine; and

Fig. 10 is a transverse sectional view of the mandrel shown in Fig. 9, taken substantially on line 10—10 thereof, and looking in the direction of the arrows associated therewith.

Fig. 11 is a perspective view of the opposed carrier blocks mounted on the end of arm 11.

The machine herein proposed for rolling and molding conical shaped containers from hot moldable wafers comprises a frame 1 that rotatably supports a longitudinally extending carrier shaft 2 on which is mounted a mandrel carrying member 4 and a mold or die carrying member that together provide a series of cooperating mold and mandrel units that are rotated by movement of the shaft 2. This unit, which is hereinafter sometimes referred to for convenience as the mold assembly is intermittently driven from a crank arm 5 that is most clearly shown in Fig. 4.

The mold or die units 6, are successively moved to a cone ejecting and loading position adjacent a loading apron 7 that successively registers with the aprons 6^a, that are respectively formed adjacent loading slots 6^b in the side wall of the conical molds. This is shown most clearly in Fig. 6. A guard flange 6^c is formed adjacent the other edge of the slot 6^b to facilitate directing the hot pliable wafers 8 into the mold through the slot 6^b. The rotation of the mandrel 9 draws the wafer into the mold where it is maintained under molding pressure as hereinafter described until it is again moved to the ejecting and loading position. The conical

molds are open at their base and are each removably secured to the supporting member 3 by a collar or flange 6^d to which the body of the mold is secured. The mold unit is preferably formed of sheet metal. In Fig. 2 the conical mold unit, its associated flanges, and the wafer are shown partially in section.

Referring again to Fig. 1, each of the mandrels 9 is carried at one end of a longitudinally slidable and rotatably mounted bayonet shaft 9^a that is mounted in bearing supports 4^a, carried by the member 4. The rear end of each bayonet shaft has a control disc 9^b that is adapted to be engaged by a cam operated arm 11 to withdraw the mandrel from the cooperating mold unit and to reassemble the mandrel and mold unit and thereby cause the loading of the mold and mandrel with a hot wafer. The control disc 9^b is held in position on the shaft by a retaining pin 9^c. A helical spring 9^d one end of which seats on the disc unit and the other end of which engages the lateral face of a driving pinion 9^e, serves to impose the desired degree of pressure on the formed pastry cone during the cooling period. A second helical spring 9^f is also interposed between the disc and the drive pinion for a purpose later set forth. On each side of the ejecting and loading position of the mandrel and mold units, the discs 9^b are engaged by a stationary cam 12, that is supported from the frame 1. Fig. 3 clearly shows the general annular shape of the cam 12. This cam has a depressed portion 12^a that permits withdrawal of the mandrels from the mold units in the ejecting and loading position and retains them in molding position during the remainder of the operating period.

One of the mandrel units is shown in detail in Fig. 9 and Fig. 10. A series of ridges are formed on the conical molding face of the mandrel by wires 9^g, that serve to engage the wafer to draw it into the molding cavity when the mandrel is rotated. The ridges formed by wires 9^g terminate near the central zone of the mandrel in order that they may partially embed themselves in the pastry of the formed cone 8^a, and carry the cone out of the mold when the mandrel is withdrawn.

A series of spring pressed fingers 13, that are carried by the shaft 2 as most clearly shown in Fig. 5, engage the open end of the formed pastry cone 8^a, when the mandrel 9 is drawn out of the mold by the operation of the bayonet shaft. The fingers follow the longitudinal contour of the mandrel to drag the formed pastry cones from the mandrel and permit them to fall on the underlying conveyer belt 14. An apron 15 and raised side portions 16 confine the released cones to the surface of the conveyer belt.

Having thus generally described the molding and mandrel units of the machine, their cooperative relation and the mechanism for controlling the coordinated movement of the machine parts will next be described.

Power is supplied to the machine through a shaft 17 and a clutch mechanism 18 that is controlled by an operating lever 19. The arrangement of these parts is shown clearly in Fig. 6. The drive shaft 17 is preferably synchronized with the baking machine in order that the wafer baking machine and the cone rolling machine herein described will be operated in synchronized relation. The clutch unit 18, is slidably carried on the end of the driving shaft 17 and is driven thereby. A train of gears 20, 21 and 22 are driven from the gear pinion 23 that is freely rotatable on the shaft 17 and that is driven from the clutch unit 18. A segmental gear wheel 24 is keyed to the shaft 20^b to which gear 20 is secured and the gear wheel 24 has a smooth periphery except for the series of gear teeth 24^a that serve to engage and operate a cam pinion 25 to intermittently advance the carrier shaft 2 by causing one complete rotation of the crank arm 5 in the direction indicated for each revolution of the gear 20. After each revolution of the cam pinion 25, the crank arm is held in the position indicated by the cam face 25^a that cooperates with the smooth peripheral portion of the gear 24. In this way, the crank arm 5 positively controls the degree of movement of the carrier shaft 2. The crank arm 5 swings through the lower 180° zone of its movement before the roller 5^b that is carried thereby enters between the pairs of spaced parallel cam blocks 26 and 27 that are carried by the mandrel supporting unit 4. During the second half of the rotation of the crank arm, the roller 5 travels radially inwardly along the cam block 26 and thereby advances the mandrel carrier and the other apparatus carried by the shaft 2 a sufficient amount to move the next mold unit into registered position with the supply apron or table 7.

In order to more accurately control the movement of the carrier shaft 2, a band brake 28 that is released only during movement of the carrier shaft 2 is provided. One end of the band brake is secured to the frame 1, and the other end thereof is secured to a cam operated arm 29. A suitable helical spring 29^a acts on the cam arm to normally hold the brake band taut over the grooved periphery of the member 4. The cam 30 that is also mounted on the shaft 20^b serves to lift the arm 29 during movement of the carrier shaft 2. The weight of the apparatus carried by the shaft 2 and its speed of operation renders it desirable to employ a releasable braking device to obtain precise rapid movement of the mold assembly.

A cam 31, that controls the movement of the mandrel operating arm 11, has a cam track 31^a that receives a roller 11^a that is carried by the arm 11. The arm 11 is pivotally carried by a supporting bracket 32 hav-

ing a guide portion 32^a arranged parallel with the plane of movement of the arm 11 to engage the side face of the arm 11 and maintain the cam roller 11^a within the cam race 31^a.

The outer end of the arm 11 has a pair of opposed V-shaped carrier blocks 11^b mounted in opposed relation thereon to receive the successive control discs 9^b of the mandrel bayonet shaft therebetween as the mold assembly is rotated. The opening between the blocks 11^b is sufficiently wide to freely receive the control discs 9^b when the arm 11 is in its forward position with the opening between the blocks in alignment with the path of travel of the control discs.

The cam 31 is so arranged that the arm 11 is in its extreme forward position when the mold and mandrel assembly is advanced one step. This brings the control disc 9^b between the opposed blocks 11^b and also opposite the depressed portion 12^a of the cam 12. After the carrier member 4 is locked into its advanced position by the crank arm 5, the cam track 31^a moves the arm 11 to the position shown in Fig. 1. The molded pastry cone is released from the mandrel 9 as the mandrel is drawn past the fingers 13. The arm 11 then moves the mandrel forward and in so doing causes the pinion 9^e to mesh with the toothed portion 33^a of a mutilated gear 33, that is carried on the same shaft 22^a as the gear 22. The mandrel is thereby rotated two or three times which draws another wafer into molding cavity. As the mold assembly is again advanced, the control disc 9^b moves from between the receiver blocks 11^b to a position in front of the annular cam 12^a which holds the mandrel within the mold until the mandrel and mold are again advanced to the loading zone.

The gear wheel 20 also carries an eccentrically operated ratchet arm 34 that serves to advance the ratchet wheel 35 a predetermined distance with each rotation of the gear wheel 20. This controls the movement of the conveyor belt 14. The conveyor belt 14 extends around a rotatably supported pulley drum 35^a that is carried by a shaft 35^b on which the ratchet wheel 35 is also mounted, and thence around a pulley drum 36 that is rotatably supported by the frame 1. An idler roll 37 maintains the conveyor belt taut.

In the operation of the proposed machine, a freshly baked wafer 8 is taken directly from the automatic baking machine (not shown) and placed while hot on the receiving table 7 in position to be introduced into a mold unit. The operation of the track cam 31, as heretofore explained, draws the mandrel 9 that is then in the loading zone from its associated mold. The formed pastry cone 8^a is carried by the mandrel because of the partial embedding of the wire ribs 9^b in the material of the cone. The fingers 13, a pair of which is associated with each mandrel, engage the open end of the cone as the mandrel is drawn between them and thus release the formed cone 8^a from the mandrel. The finished cones drop onto the conveyor belt from which they are manually gathered up and packed in suitable containers.

The cam 31 then operates the arm 11 to return the mandrel to its associated mold. Because of the weight of the mandrel, a slight lag sometimes develops in the return of the mandrel to its mold. In order to prevent too great a lag, a supplemental cushioning spring 9^f is brought into operation when the spring 9^d is compressed a predetermined degree. This insures proper registering of the driven pinion 9^e with the driving teeth of the mutilated gear 33 to rotate the mandrel the desired number of revolutions. Delayed meshing of the pinion 9^e with the gear 33 causes incomplete operation of the mandrel and, as a result, the wafer is not drawn completely into the mold. The rotation of the mandrel causes the mandrel to engage the hot wafer 8 to draw the wafer into the conical mold where it remains long enough to properly cool and take the desired permanent shape before it is ejected.

The operation of the crank arm 5 causes the mold assembly to be positively advanced to the succeeding position which brings the control disc 9^b in front of the cam 12. This holds the mandrel in the mold under the pressure of the spring 9^d. The release of the band brake 28 by the cam 30 permits movement of the mold assembly by the crank arm and thereafter arrests the movement without undue strain on the crank arm.

From a consideration of the above described cone baking machine and its method of operation, it will be seen that the device is capable of very rapid production of pastry cones for use as containers in the dispensing of ice cream and the like. A very large number of such cones can readily be produced by this machine in a very short time. In fact, it has been found, in commercial operation, that the device is capable of forming cones as rapidly as the cakes or wafers can be baked in the most rapid form of wafer baking machine now available.

One of the particular advantages to be enjoyed from practicing the invention is the shapely appearance of the cone in its finished condition. The outer face of the cone is regular and well formed. The uniform outside dimension of the cones facilitates packing the cones in containers for distribution to the trade. Another important benefit to be derived from the invention is the satisfactory closing of the apex of the cone in the molding operation. It is very difficult to obtain this result on cones formed on the conventional type of molding machine now in use, so far as applicant is aware. The ma-

chine herein proposed consistently gives cones in which the apex is closed. The commercial advantage of having a machine capable of forming a high sugar content cone will be obvious to those skilled in the art.

Although I have described only one machine to illustrate the invention, it will be obvious to those skilled in the art that many modifications may be made in the structural details and arrangement of the parts of the machine and I desire, therefore, that only such limitations shall be imposed on the invention as are set forth in the accompanying claims.

What I claim is:

1. A cone rolling machine comprising a series of slotted molds carried by a rotatable member, means for rotating said member to progressively bring each of said molds to a charging position, a mandrel for each mold, means adapted to successively withdraw each of said mandrels longitudinally from its associated mold to discharge molded cones therefrom, means adapted to successively reinsert said mandrels in said molds and cause the rotation thereof to draw material into said slotted mold, and means adapted to maintain said mandrel within the mold under pressure.

2. In a cone making machine, the combination of a plurality of conical slotted molds, a conical mandrel for each mold, means for moving said molds and their associated mandrels successively through a loading zone, means for separating said molds and mandrels at a predetermined point in their advance to discharge molded material therefrom, means for reassembling said mold and mandrel units in the loading zone and for rotating the mandrel within the cooperating mold within the loading zone to cause a wafer of moldable material to be drawn through said slot in the mold and between the mandrel and the mold, means for stopping the rotation of the mandrel in the mold, and means for maintaining the mandrel under pressure within the mold during the remainder of its travel.

3. In a cone making machine, the combination of a plurality of conical molds, a conical mandrel for each mold, means for moving said molds and their associated mandrels step by step to cause them to successively pass through a loading zone, means for separating said molds and mandrels at a predetermined point in their advance to discharge molded material therefrom, means for reassembling said mold and mandrel units in the loading zone and for rotating the mandrel within the cooperating mold within the loading zone to cause a wafer of moldable material to be drawn through said slot in the mold and between the mandrel and the mold, means for stopping the rotation of the mandrel in the mold, and means for maintaining the mandrel within the mold during the remainder of its travel.

4. In a cone rolling machine, the combination of a plurality of conical mold units, a mandrel associated with each conical mold, means for successively advancing said mold and mandrel units to a localized operating zone, means for moving said mandrel units out of operative relation with the associated mold unit for ejecting formed conical bodies from said mold unit when within the said operating zone, means for returning said mandrel to said conical mold in the operating zone and for rotating said mandrel within the said mold to interpose a wafer of moldable material between the mandrel and the conical mold, means for stopping the rotation of the mandrel in the mold, and means for exerting a predetermined pressure upon said material between the mandrel and the mold during the remainder of the travel of the said units.

5. A cone rolling machine comprising a pair of rigidly connected spaced carrier units rotatably mounted, a plurality of conical mold units mounted in spaced relation around the periphery of one of said units, a plurality of mandrels carried by the other of said carrier units, each of said mold units having a mandrel adapted to register therewith, means for successively advancing said mold units and their associated mandrels into and out of a loading zone, means for separating said mandrel and said conical mold within the loading zone to eject the molded material from between the mandrel and the mold, means for reassembling said mandrel and mold in the loading zone, means for relatively rotating said mandrel and said mold unit within the loading zone to interpose moldable material between the mandrel and the mold, means for imposing predetermined pressure on the moldable material in the positions of the mold and mandrel units outside of the loading zone.

6. A cone rolling machine comprising a pair of rotatable rigidly connected spaced carrier units one of which has a plurality of conical molds arranged in spaced relation around its periphery and the other of which has a plurality of rotatably mounted and longitudinally slidable mandrels so arranged that each of said molds has a mandrel associated therewith, means for rotating said carrier unit in step by step movement to bring said mold units successively into a loading zone, means adapted to withdraw the mandrel in the loading zone from its associated mold, means for releasing molded material from said mandrel in its withdrawn position, means for moving said mandrel into cooperative relation with the associated mold unit, means for thereafter rotating said mandrel within the said mold unit to charge the mold unit with moldable material, and means for

maintaining said mandrel within the mold unit until said mandrel and mold unit are again advanced to the loading zone.

7. In a cone making machine, the combination of a plurality of conical molds, a conical mandrel for each mold, means for moving said molds and their associated mandrels successively into and out of a loading zone, means for longitudinally shifting the mandrel in the loading zone out of engagement with the cooperating mold and then returning said mandrel to cooperative relation with its mold, said means being adapted to rotate the mandrel within the mold only while said mold is in the loading zone, and means for holding the remaining mandrels under pressure in the mold members.

8. A cone rolling machine comprising a series of molds carried by a rotatable member, means for rotating said member to progressively bring each of said molds to a charging position comprising a series of spaced radial cam raceways carried by the rotatable member, a crank arm adapted to progressively engage the raceways, a cam gear connected to the crank arm for intermittently operating said crank arm, and a continuously operated mutilated gear for intermittently operating the cam gear, a mandrel for each mold, means for successively withdrawing each of said mandrels from its associated mold to discharge molded cones therefrom, means for successively reinserting said mandrels in said molds and causing the rotation thereof to draw material into said mold, and means for maintaining said mandrel within the mold under pressure.

9. In a cone making machine, the combination of a mold assembly comprising a plurality of conical molds and a conical mandrel for each mold, said mold assembly having a series of spaced cam raceways, a crank arm having a cam roller adapted to engage said spaced raceways to advance said assembly upon rotation of said arm, a cam gear for operating said crank arm intermittently, said crank arm being locked into engaged position with one of said raceways while in its arrested position to positively lock said mold assembly in its advanced position, a continuously rotating mutilated gear for periodically rotating said cam arm to thereby intermittently advance said mold assembly, a periodically operated brake mechanism for arresting movement of the mold assembly after each advance thereof whereby one of said conical molds and its associated mandrel is brought to arrested position within the loading zone, a cam actuated arm for withdrawing the mandrel positioned in the loading zone from the associated mold to eject formed cones therefrom and for thereafter returning said mandrel to mating relation with said mold, means for rotating said mandrel within the mold after its return thereto to interpose a wafer of moldable material between the mandrel and the mold, and means for maintaining the mandrel under pressure within the mold during the remainder of its travel.

10. In a cone rolling machine, the combination of a mold assembly comprising a plurality of conical mold units and a mandrel associated with each conical mold, mold assembly advancing mechanism for successively advancing said mold and mandrel units to a localized operating zone, periodically operated brake mechanism for arresting movement of the mold assembly after each advance thereof, means for locking said mold assembly in each advanced position, means for ejecting formed conical bodies from said mold units when said units are within the operating zone, means for reassembling each of said mandrels with its associated conical mold after the ejection of the formed conical body, means for rotating said mandrel within the mold after the same are assembled in operative relation for drawing a wafer of moldable material between the mandrel and the conical mold, and means imposing a predetermined pressure upon said material between the mandrel and the mold during the travel of the respective mold and mandrel units outside of the operating zone.

11. In a cone rolling machine, the combination of a mold assembly comprising a plurality of conical mold units and a mandrel associated with each mold unit, mold assembly advancing mechanism for successively advancing said mold and mandrel units to a localized operating zone, a periodically operated brake mechanism for arresting movement of the mold assembly after each advance thereof and for positively locking said mold assembly in each advanced position, means for withdrawing the mandrel from the mold positioned in the operating zone to eject the formed conical body therefrom and for returning said mandrel to its associated conical mold and thereafter rotating said mandrel within the mold to interpose a wafer of moldable material between the mandrel and the conical mold, and means for exerting a predetermined molding pressure upon the material between the mandrel and the mold during the travel of each of said units outside of the operating zone.

12. A cone rolling machine comprising a pair of rigidly connected spaced carrier units rotatably mounted, a plurality of open ended conical molds each mounted in spaced relation around the periphery of said carrier units, and each mold having an opening in the side thereof, a plurality of mandrels also carried by the said carrier units, each mold having a mandrel adapted to register therewith, a series of spaced cam raceways rigidly connected to the carrier units, means for successively advancing said mold units and their associated mandrels into and out of a

loading zone comprising a crank arm having a cam race engaging portion at one extremity thereof for selectively and progressively engaging said spaced cam raceways, a cam gear for operating said crank arm through substantially a full revolution for each advance of the mold assembly, means for intermittently rotating said cam arm, a periodically operated brake mechanism for arresting movement of the assembled mold and mandrel units after each advance thereof, means for releasing said brake mechanism during the major portion of the operation of said periodically operated mechanism, means for separating said mandrel and conical mold units within the loading zone to eject formed conical bodies therefrom, means for reassembling said mold and mandrel units within the loading zone and for rotating the mandrel within the cooperating mold after its return thereto to draw moldable material between the mandrel and the mold, and means for imposing predetermined molding pressure on the mandrel units during operation thereof outside of the loading zone.

13. In a cone rolling machine, the combination of a mold assembly comprising a plurality of conical mold units and a mandrel associated with each conical mold, mold assembly advancing mechanism for successively advancing mold and mandrel units into and out of a loading zone comprising a crank arm, spaced radial cam tracks carried by said mold assembly and engageable with said crank to successively advance said mold units and their associated mandrels into and out of a loading zone, a periodically operated brake mechanism adapted to arrest movement of the mold assembly after each advance thereof, cam actuated means for releasing said brake mechanism substantially coincident with the movement of the crank arm, said crank arm being adapted to remain engaged with one of said cam tracks after each advancing operation to positively lock said mold assembly in position during the period of arrested operation of the crank arm, a single cam operated arm for selectively and progressively removing one of said mandrels from its associated mold to eject molded material therefrom and thereafter returning said mandrel to mating relation with its associated mold, a continuously operated mutilated gear, a pinion carried by each mandrel selectively slidable into and out of engagement with said mutilated gear to thereby intermittently and selectively rotate said mandrels within the mold units while positioned in the loading zone and in operative engagement with the cooperating mold.

14. A cone rolling machine comprising a series of open ended conical molds carried by a rotatable member, each mold having an opening in the side thereof, means for rotating said member to progressively bring each of said molds to a charging position comprising a series of spaced cam raceways carried by the rotatable member, a crank arm having means adapted to progressively and selectively engage said raceways to rotate said rotatable member a predetermined degree with each revolution of said crank, means for intermittently operating said crank arm adapted to bring said arm to an arrested position while engaged with one of said raceways, periodically operated brake mechanism adapted to arrest movement of the rotatable member at the termination of each advance movement thereof, means for releasing said brake mechanism substantially coincident with the movement of the crank arm, a mandrel for each mold, means for successively withdrawing said mandrels from their associated molds to discharge molded cones therefrom, means for successively reinserting said mandrels in said molds, a pinion carried by each mandrel, a single gear selectively engageable with the pinion of the mandrel when positioned in the loading zone whereby said mandrel is rotated in the loading zone to draw moldable material through the open side thereof and into the molding cavity, and means for maintaining yielding pressure on the mandrel within the mold during the travel of the mold outside of the loading zone.

15. A cone rolling machine comprising a series of open ended conical molds carried by a rotatable member, each mold having an opening in the side wall thereof, means for intermittently rotating said member to progressively bring each of said molds to a charging position, means for locking said rotatable member in each advanced position during the periods of arrested operation thereof, periodically operated brake mechanism adapted to arrest the movement of the mold assembly after each advance thereof, means for releasing said brake mechanism substantially coincident with the movement of the rotatable member, a mandrel for each mold, means for successively withdrawing each mandrel from its associated mold to discharge molded cones therefrom when in the charging position, means for thereafter reinserting said mandrel in its cooperating mold, means for rotating the mandrel in the mold to draw a pliable wafer of moldable material into the mold through the opening in the side wall thereof, and means for maintaining the moldable material under pressure during the travel of each of said molds outside of the charging position.

16. A cone rolling machine comprising a series of slotted molds carried by a rotatable member, means for rotating said member to bring each of said molds step by step to a charging position, a longitudinally movable mandrel for each mold, means for moving a mandrel into a corresponding mold when in

charging position, means for causing rotation of the mandrel in the mold to draw a wafer into the mold through the slot therein and to form a cone, means for imposing predetermined pressure on the wafer between the mandrel and mold during the successive, step by step advances of the rotatable mechanism after the mold has been formed, and means for withdrawing the mandrel from the mold and ejecting the formed cone from the mandrel.

In testimony whereof I affix my signature.

CARL R. TAYLOR.