No. 862,169. PATENTED AUG. 6, 1907.

E. J. JENNER.

STICK CANDY MACHINE.

APPLICATION FILED DEC. 3, 1906.

8 SHEETS—SHEET 1.

Fig. 4.

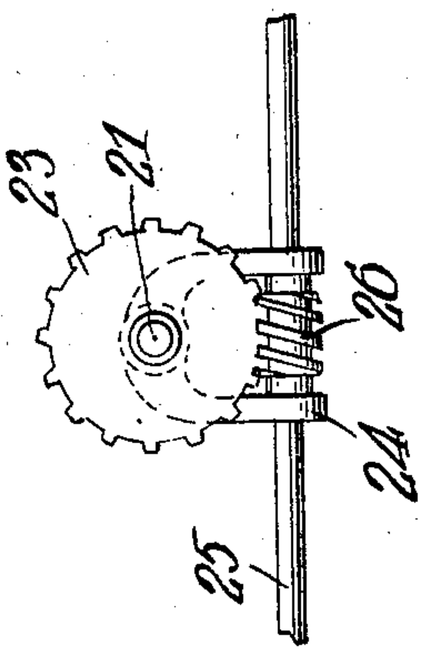

Fig. 1.

Witnesses

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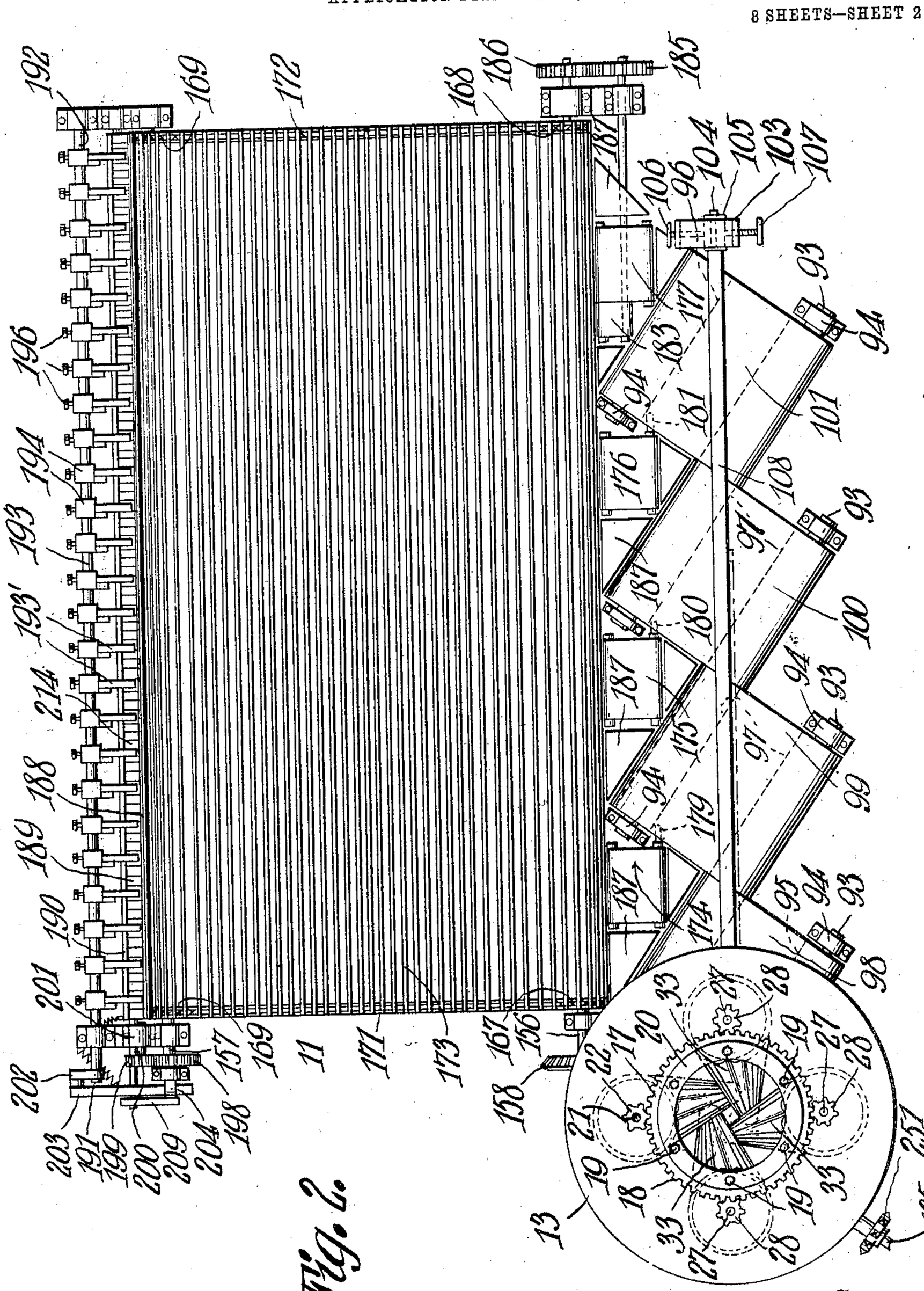

Fig. 2.

Witnesses
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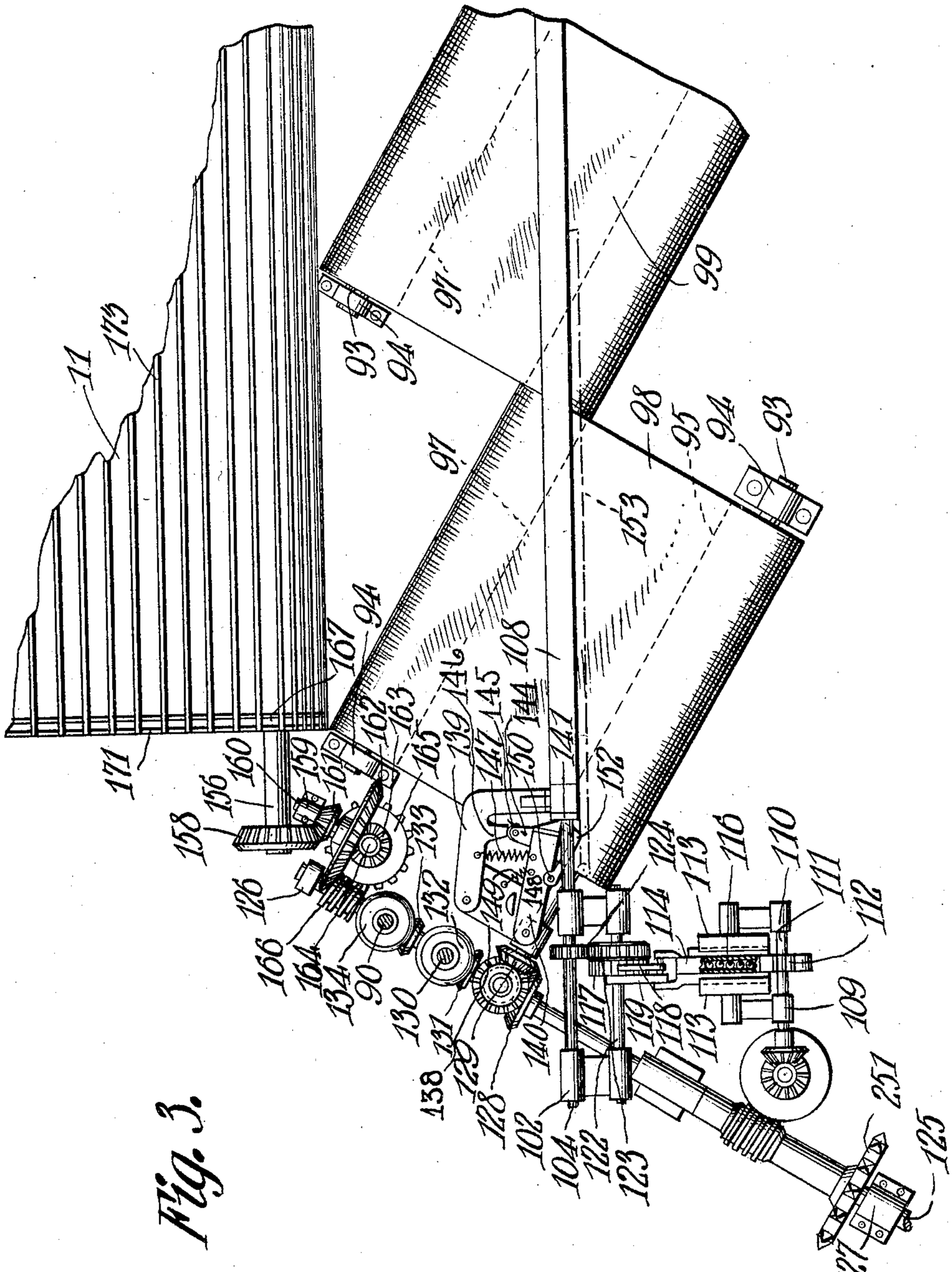

Fig. 3.

Witnesses
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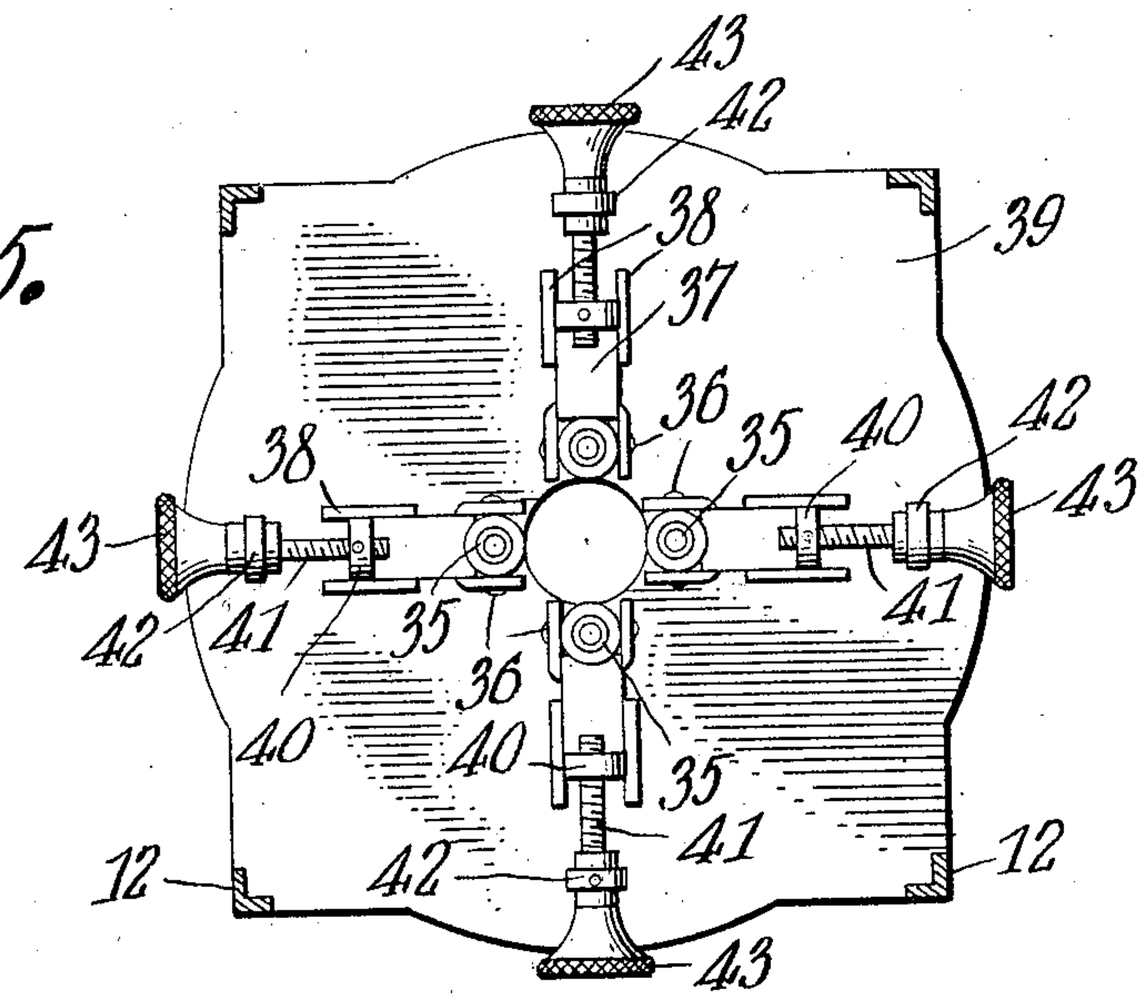
8 SHEETS—SHEET 4.

Fig. 5.



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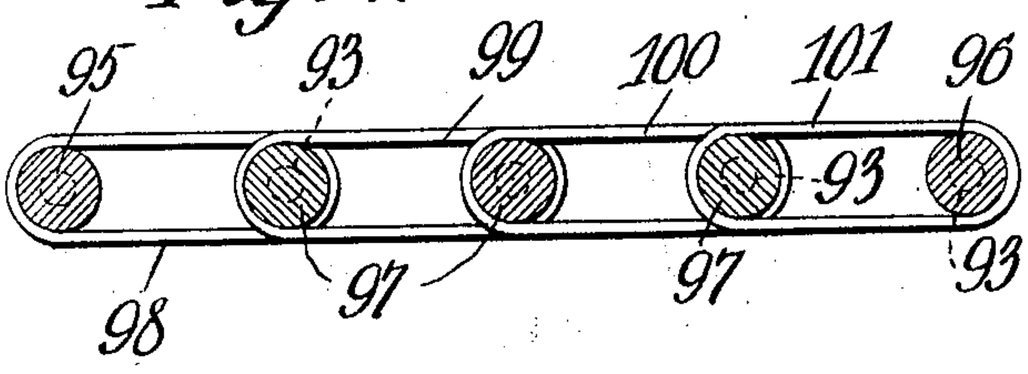

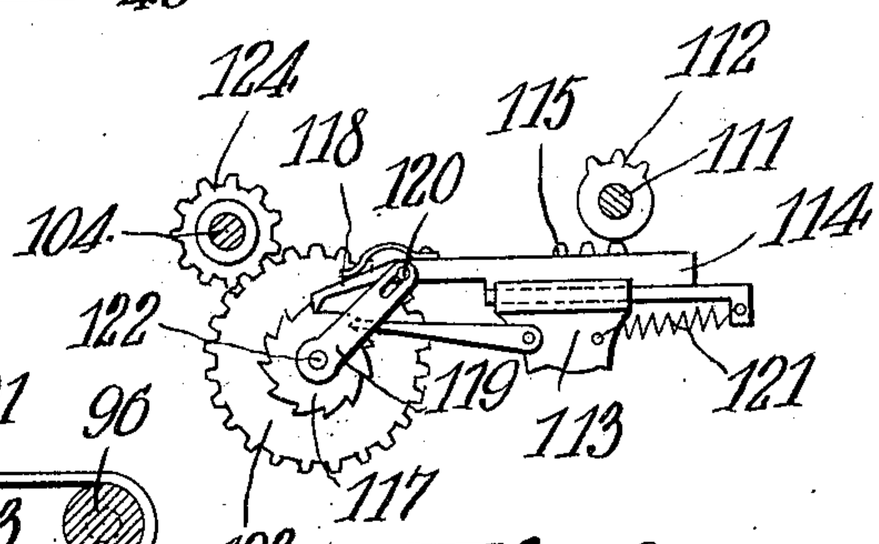

Fig. 8.

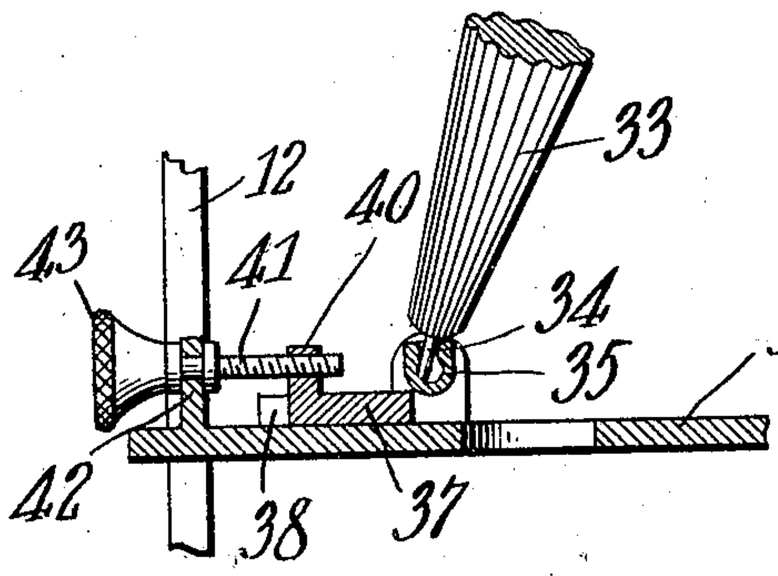

Fig. 6.

Witnesses
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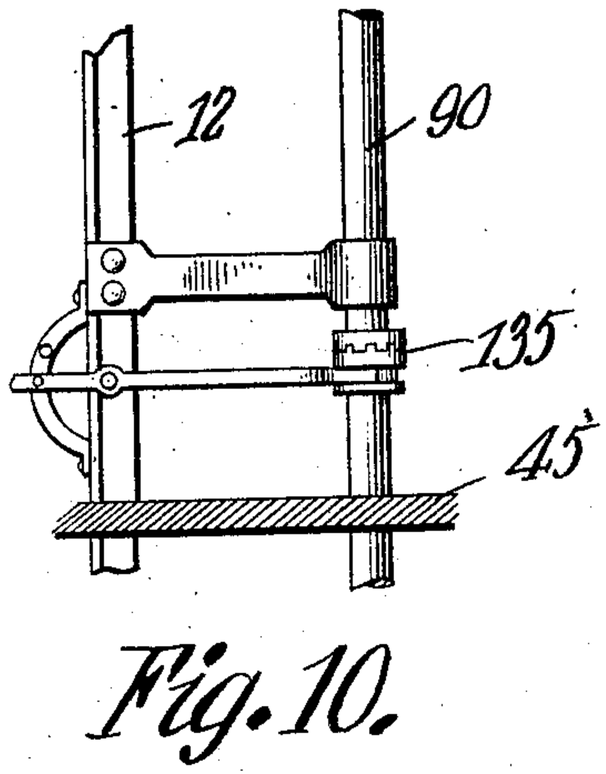

Fig. 10.

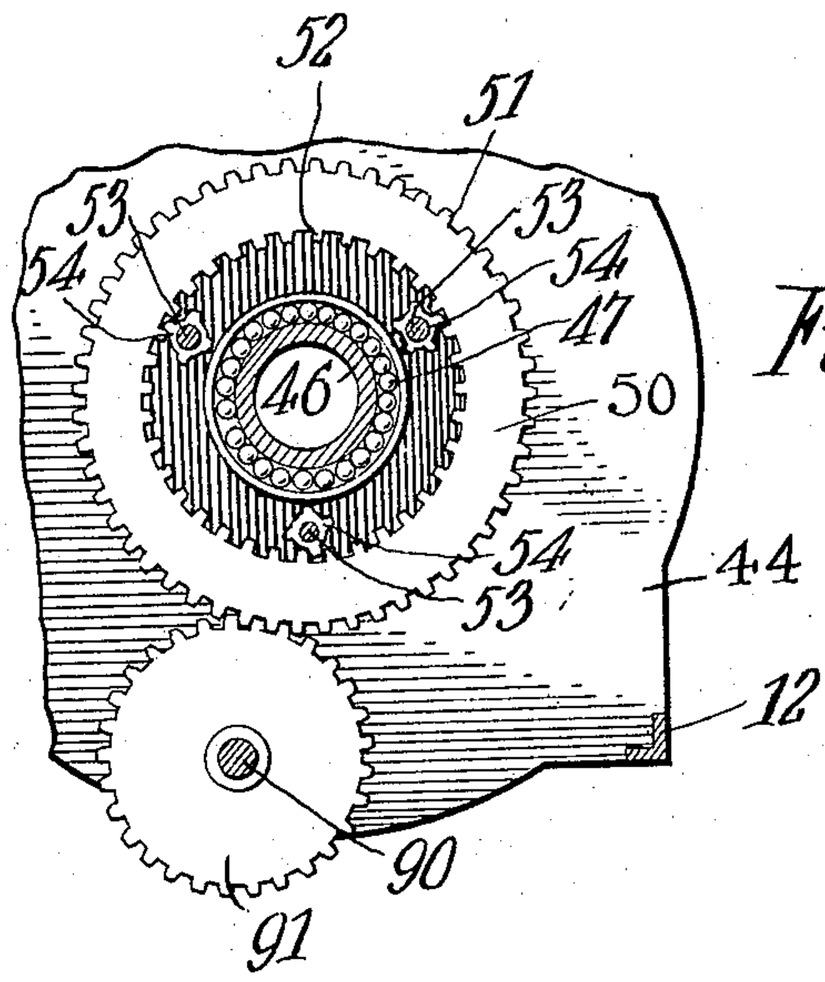

Fig. 9.

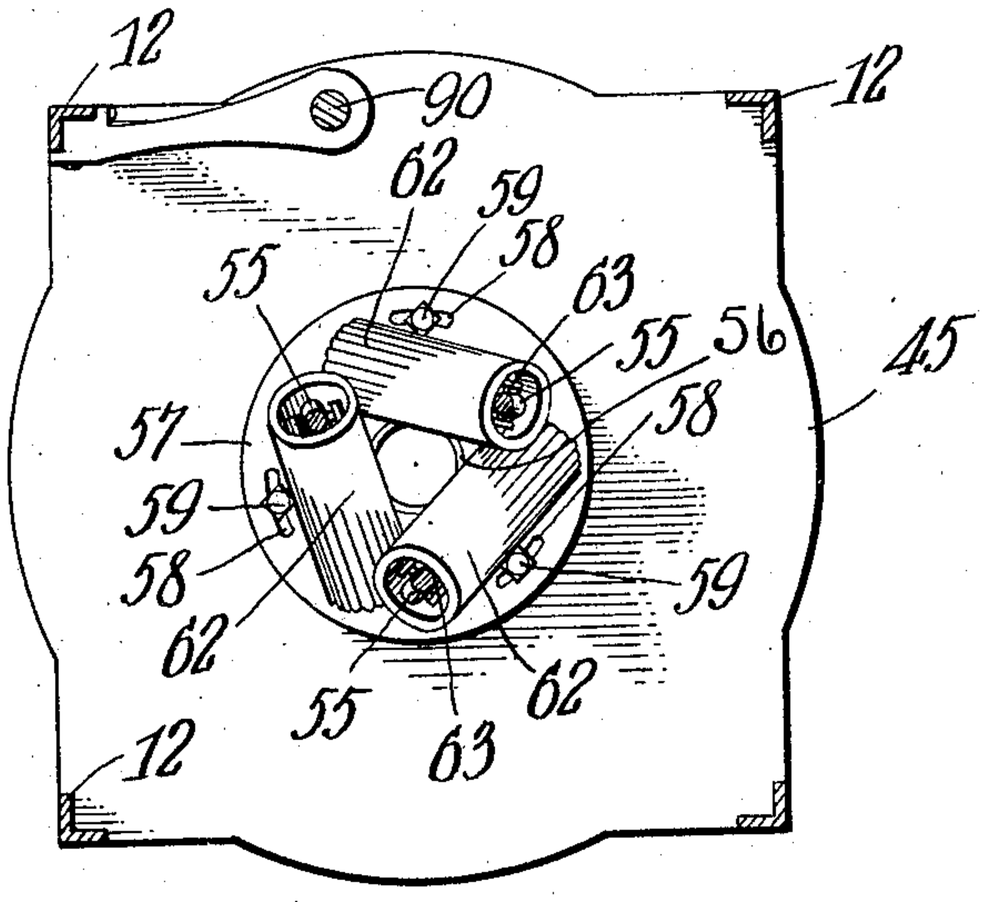

Fig. 11.

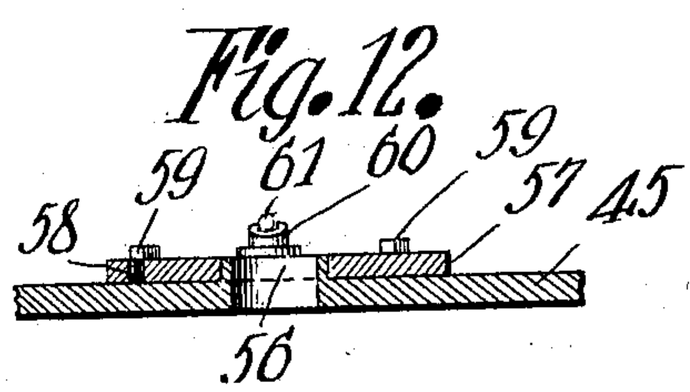

Fig. 12.

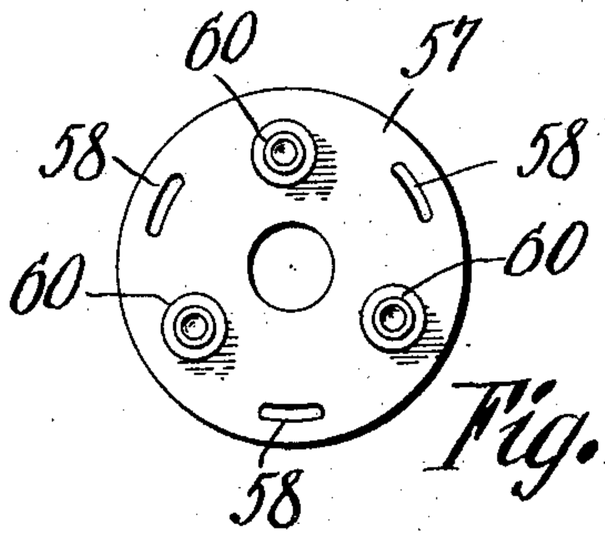

Fig. 13.

Witnesses
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Fig. 14.

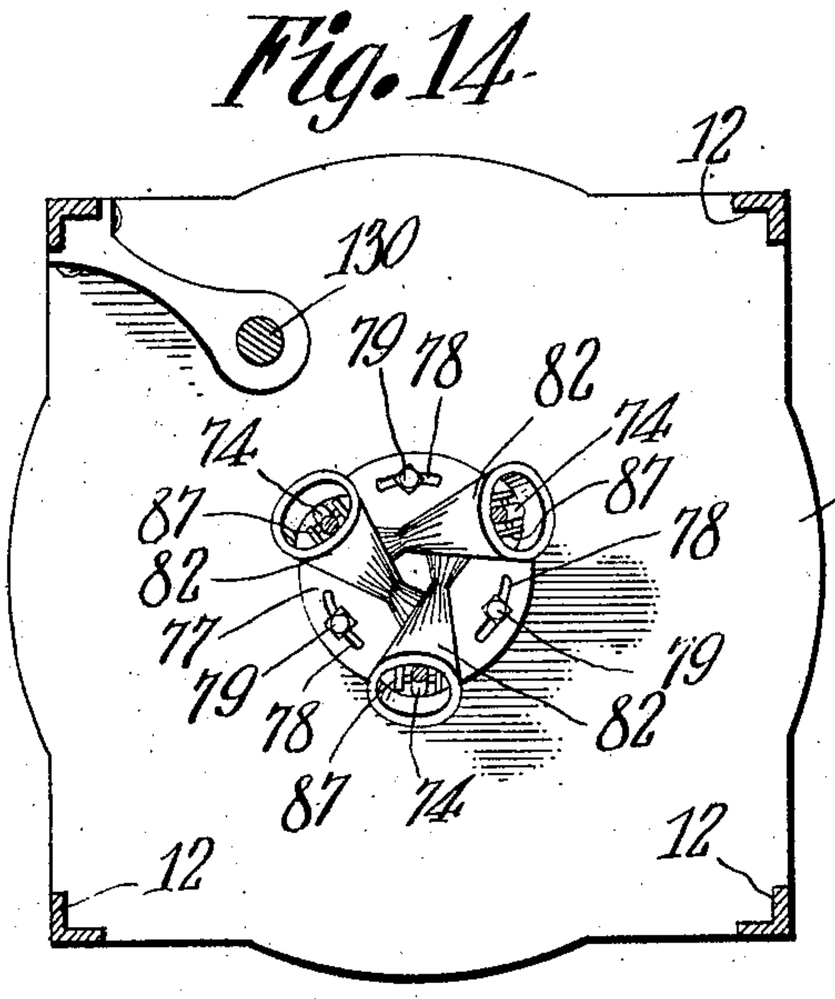

Fig. 15.

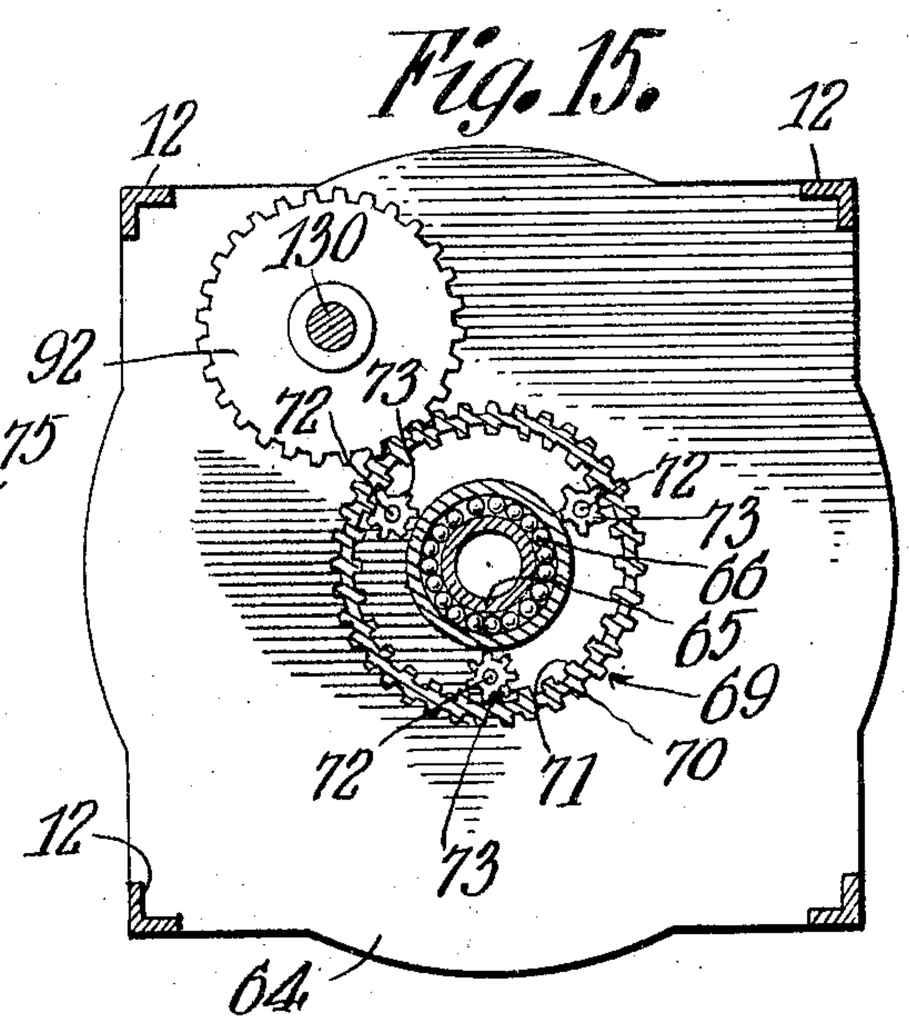

Fig. 16.

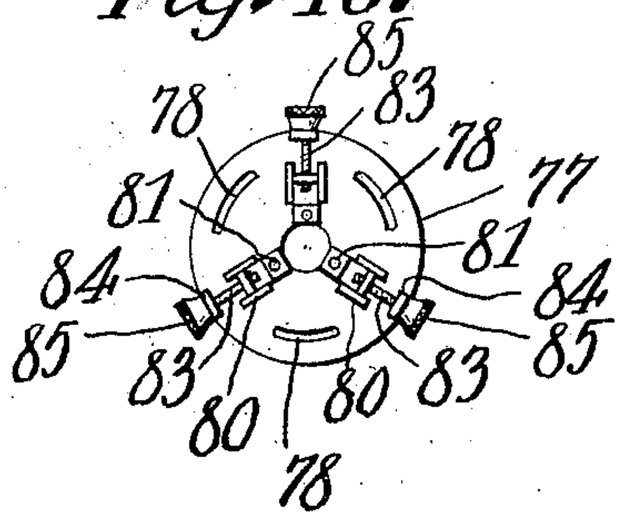

Fig. 17.

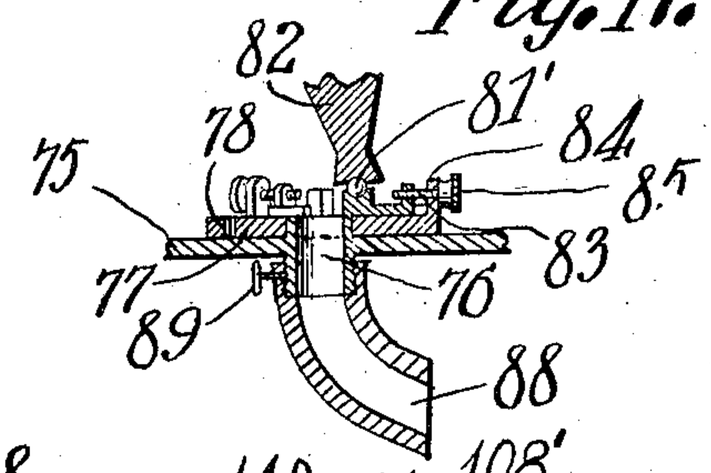

Fig. 18.

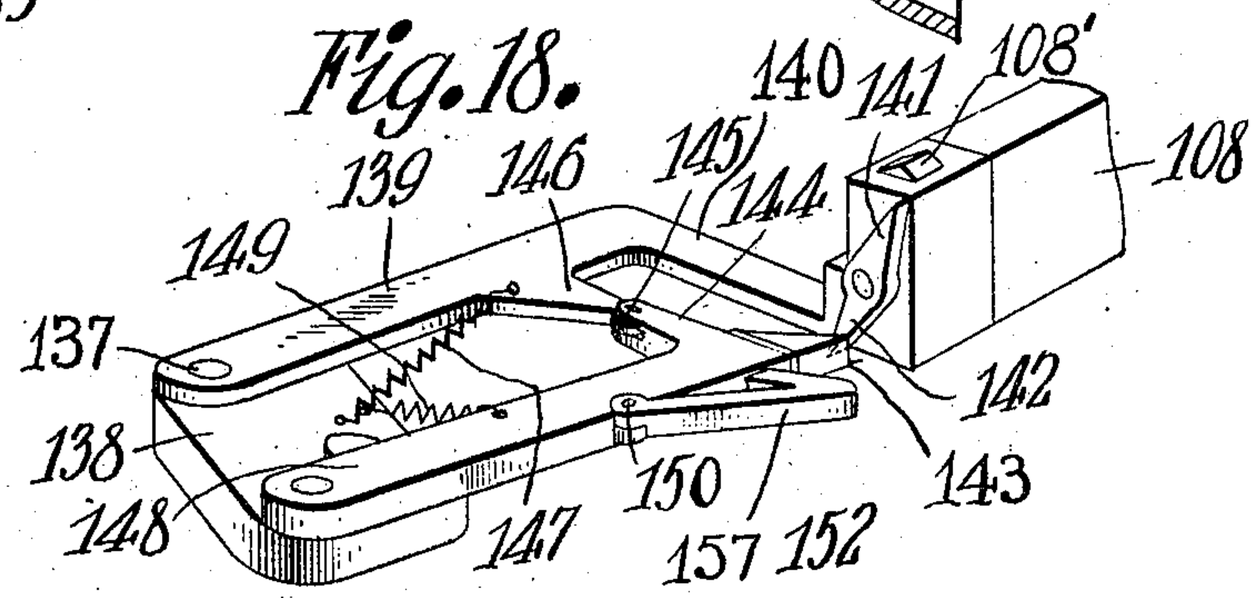

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Fig. 19.

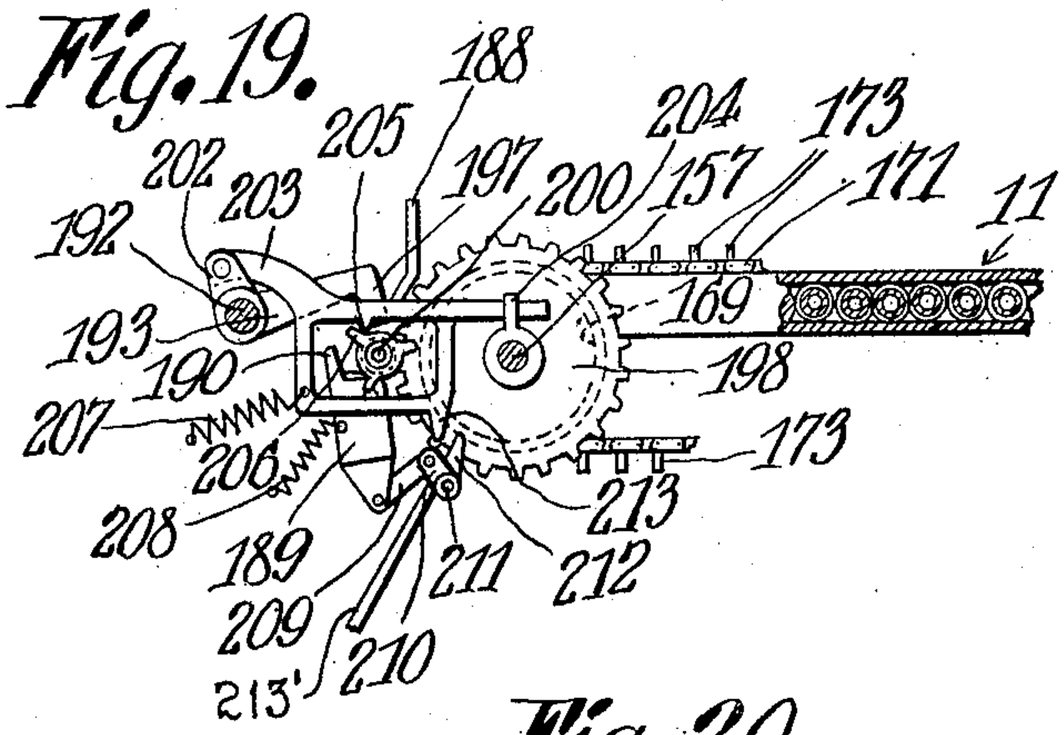


Fig. 20.

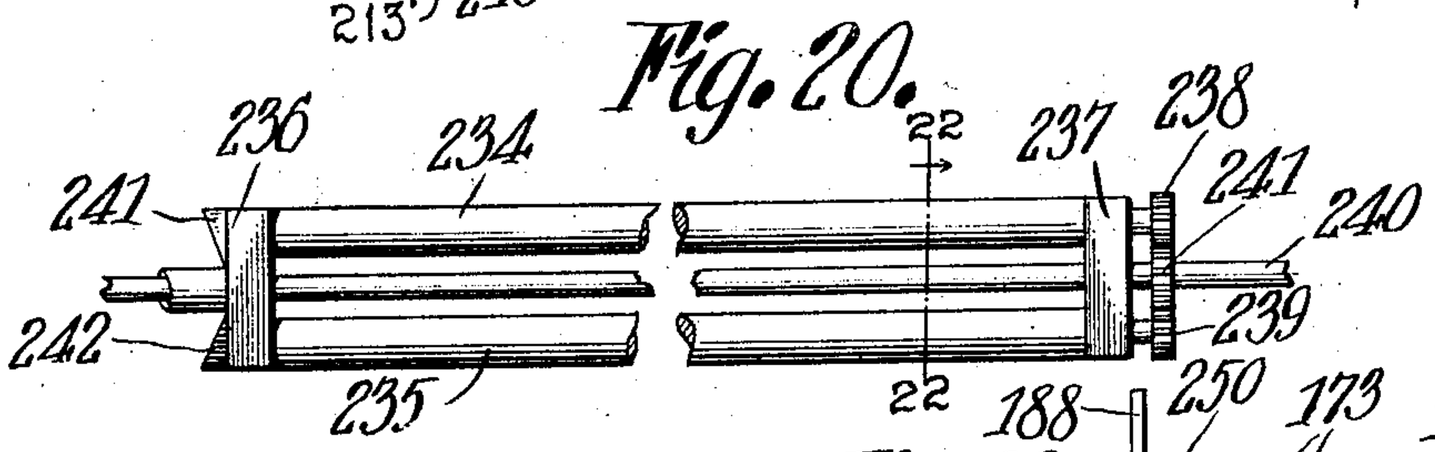


Fig. 21.

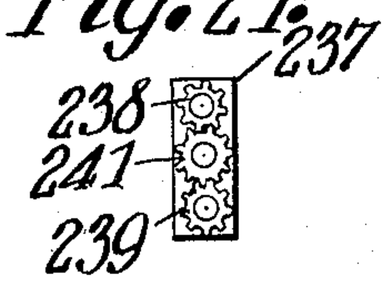


Fig. 22.

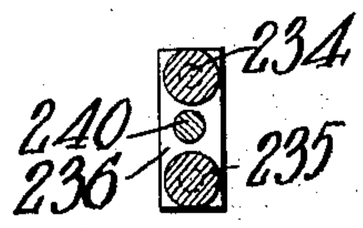


Fig. 23.

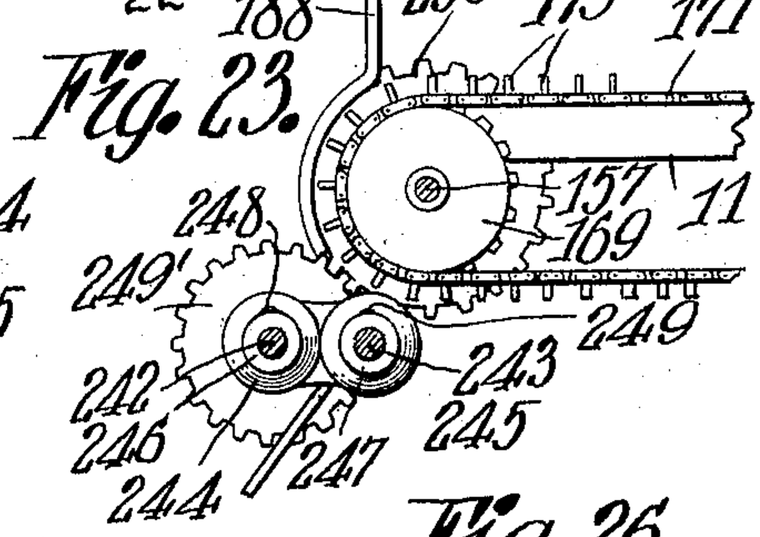


Fig. 24.

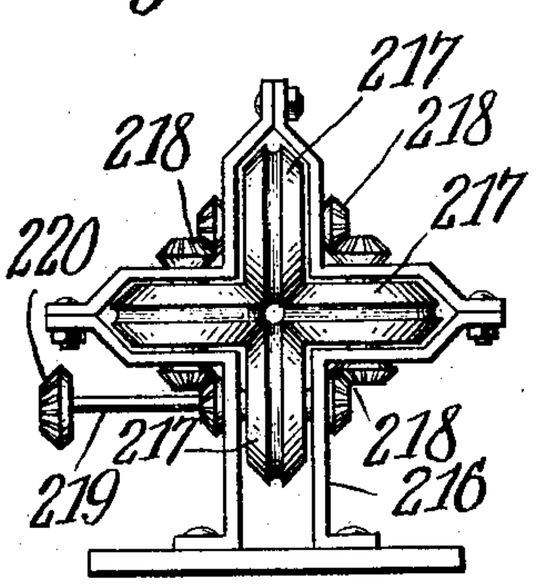


Fig. 25.

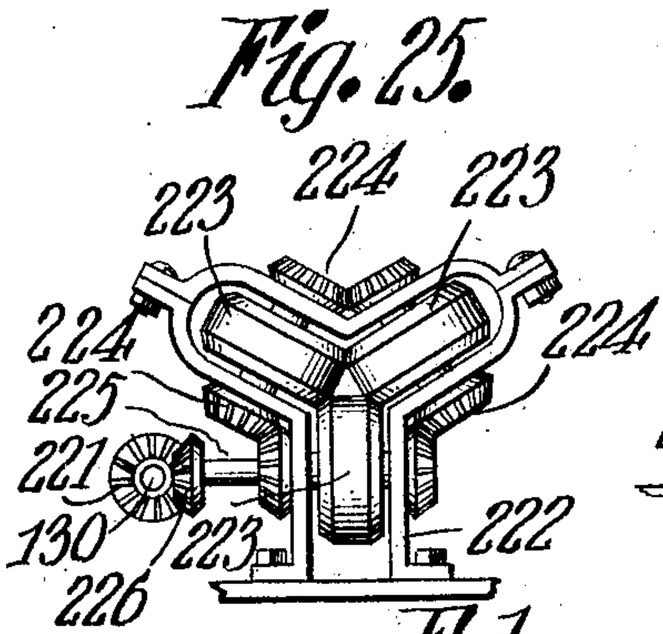
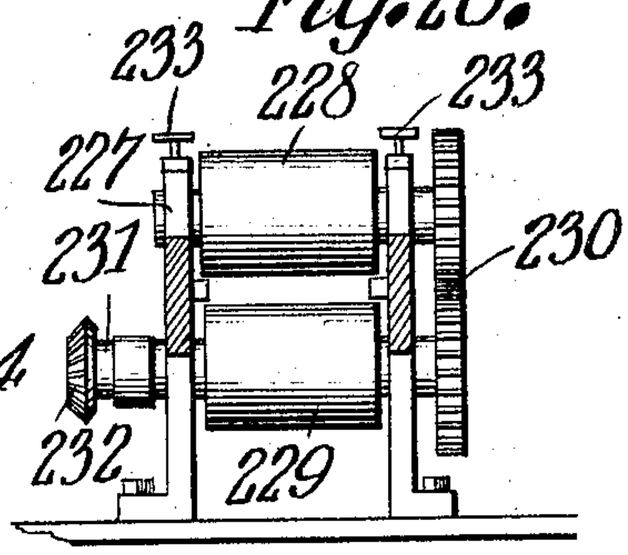


Fig. 26.



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STICK CANDY MACHINE.

APPLICATION FILED DEC. 3, 1906.

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Fig. 27.

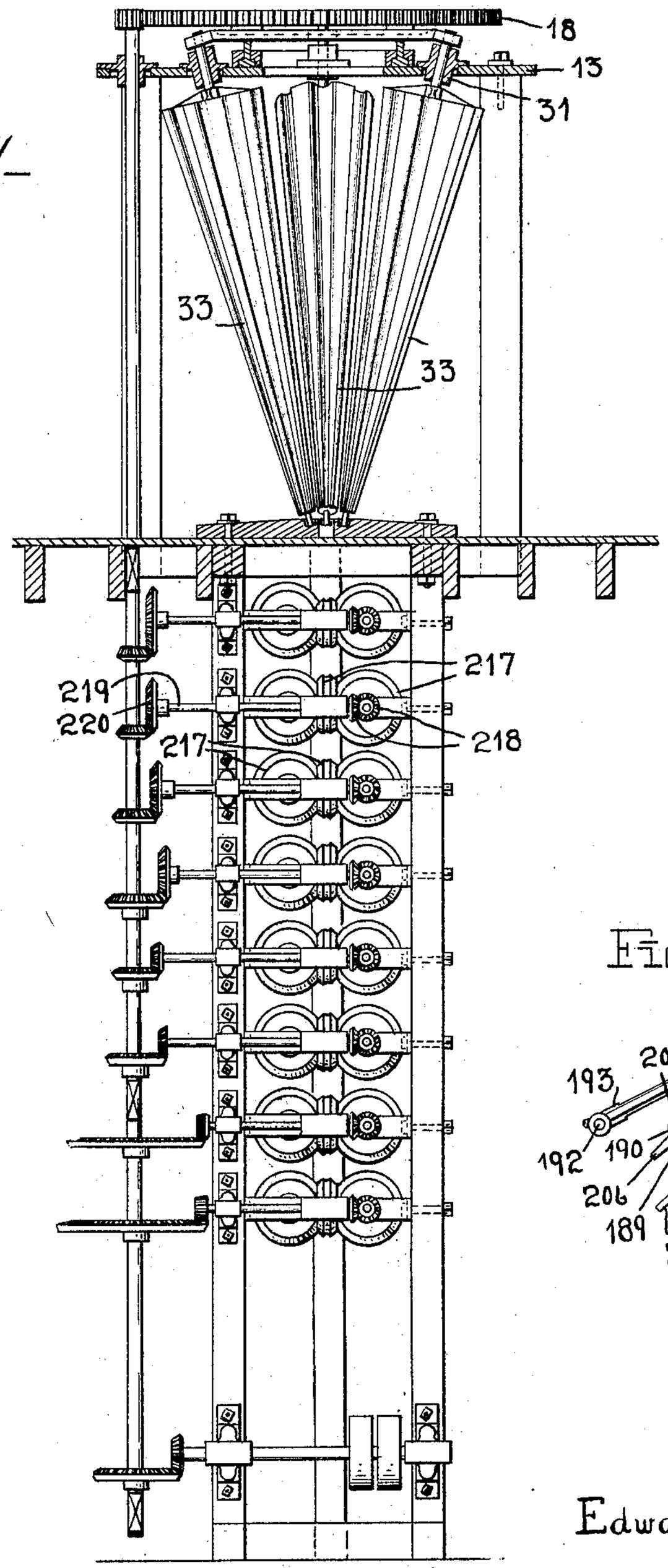
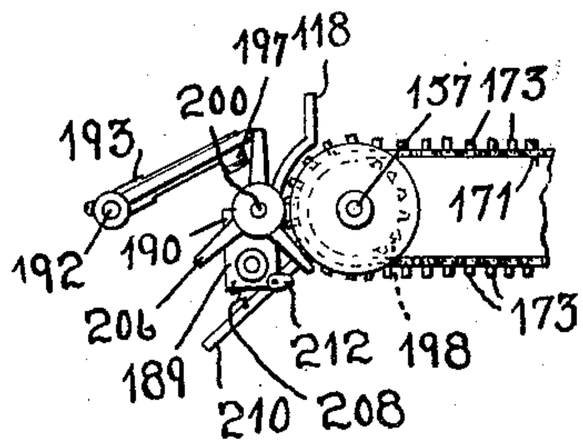


Fig. 28.



Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD J. JENNER, OF SAN ANTONIO, TEXAS.

STICK-CANDY MACHINE.

No. 862,169. Specification of Letters Patent. Patented Aug. 6, 1907.

Application filed December 3, 1906. Serial No. 346,141.

To all whom it may concern:

Be it known that I, EDWARD J. JENNER, a citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented certain new and useful Improvements in Stick-Candy Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for reducing a batch of candy into sticks of uniform size, and twisted, and has for its object to simplify and improve the construction and increase the efficiency and utility of machines of this character.

In the improved apparatus is comprised a receptacle for the batch of candy to be reduced, a mechanism for partially reducing the batch into relatively large sticks, forming and twisting it at the same time, a mechanism for still further reducing the material and imparting to its surface spirally disposed grooves or channels, a mechanism effecting the final reduction and the final twist, a mechanism for feeding the finally reduced material to a conveyer mechanism which is adapted to retain the material in its twisted condition, a mechanism for severing a portion of the finally reduced material, a mechanism for cooling the severed portion and conducting it to a receptacle, and a mechanism for severing the reduced portion into sticks of predetermined length.

The receptacle into which the batch of candy is first deposited, is preferably formed in hopper shape.

The mechanism for producing the partial reduction and twisting consists of a plurality of tapered rollers converging toward their lower ends and fluted longitudinally, flutings likewise converging toward the smaller end of the rollers and arranged to be rotated to produce a combined drawing, twisting, and reducing effect upon the batch of candy.

The second combined reducing and twisting mechanism consists of a plurality of rollers mounted for rotation in an inclined position, and fluted or grooved for a portion of their length, the grooves covering only portions of the length of each roller, and increasing in length thereon.

The mechanism for producing the final reduction and the final twist consists of a plurality of rollers reduced in size intermediate their length, with the smallest portions nearest the lower or discharge ends, these latter rollers being likewise fluted for a portion of their lengths.

The final reduced material is fed from the final reducing roller upon a plurality of progressively arranged endless conveyer belts, the belts disposed at an angle transversely of the movement of the reduced material, and retained in position upon the belts by a stop bar adapted to be rotated one-half a revolution at certain predetermined periods, to release the portion of reduced material and dispose the stop arm in position to support the next portion of reduced material.

The severing mechanism is located adjacent to the discharge device below the final reducing rollers, and operates in conjunction with the intermittently rotative stop arm, the portion of reduced material being thus severed and carried beneath the stop arm by the moving belts instantaneously, and thus convey the severed material out of the way of the next portion of reduced material. The diagonally disposed belts while holding the material against the stop bar also maintain the reduced portion in its twisted condition, and effectually prevents their untwisting while being fed to the cooling table.

The cooling table is located adjacent to the terminals of the diagonal conveyer belts, and is adapted to be supplied with cold water or other cooling element, and over which an endless conveyer belt is adapted to be moved to convey the severed sections of the reduced and twisted material slowly over the cooling table.

The receptacle for the cooled sections is located at the outer terminal of the conveyer belts which pass over the cooling table, and is adapted to receive the cooled sections of material, and hold them in position to be severed into the required "stick" lengths.

The speed of the second reducing mechanism is greater than the speed of the first reducing mechanism, so that a drawing effect is produced longitudinally of the material the same time that it is reduced and twisted, while the mechanism for producing the final reduction and twisting is operated at a still greater speed to produce a final drawing and twisting effect upon the material.

In operating the device, the batch of candy is first properly cooled and "striped" in the same manner as when reduced into stick form by hand and deposited in the receiver or hopper, and is conducted thence into the first reducing and twisting mechanism. The tapered fluted rollers are set at suitable angles to bring the lower smaller ends close enough together to produce an opening of about one and one-half inches. This arrangement causes the rollers to slightly twist around and cross each other at their lower smaller ends, and causes them to have a reducing and twisting effect upon the material as it passes through. The rollers are adjustable, to increase or decrease their distances apart at their lower ends, and thereby increase or decrease the diameter of the material which passes through them.

The tapered rollers revolve in the same direction which causes the batch of candy passing between them to revolve in the opposite direction, thus producing a continuously revolving conical mass which slightly twists and gradually decreases in size, and is discharged from the tapered rollers in the form of a perfectly round stick to correspond in size to the spaces between the

lower ends of the rollers after the material in its partially reduced condition leaves the tapered rollers, which is automatically fed to the second twister mechanism, which is composed of three rollers of uniform size throughout and set at angles to cross each other near the center, the space between them at their crossing points being smaller than the material discharged from the tapered roller, thus reducing the material to a still greater extent.

The uniform sized rollers are revolved in the same direction as the tapered rollers, but at increased speed and having the same effect on the material as the tapered rollers, but reducing it to a still smaller size, preferably to about seven-eighths of an inch in diameter. The uniform sized rollers have corrugations or grooves in their surfaces, the corrugations extending entirely around the rollers at their lower portions and spaced uniformly and are consecutively lengthened toward the upper ends, so that one groove only extends the entire length of each roller. By this means, a certain amount of slipping or smooth space is provided, beginning at the contact point of the rollers, where they cross each other, and gradually increase in area toward the top of the rollers. This graduated slipping space prevents the wedging or choking of the material between the rollers, whereas if the rollers were entirely smooth, they would have a tendency to slip on the material and fail to reduce or twist the same. On the other hand, if the rollers were fluted for their whole length, they would force the candy too rapidly, and cause an unnecessary strain on the rollers and require much stronger rollers and greater power to operate them.

By commencing at the contact point where the rollers cross each other and arrange the grooves to gradually "run out" or until only one groove extends to the top of the rollers, and produce a relatively large smooth or uncorrugated surface at the tops of the rollers, the reducer acts gradually on the material, and increasing its reduced capacity correspondingly with the reduction of the material. Each additional groove in the rollers as the mass moves downward increases the speed of the reducing action so that where the rollers cross each other and the grooves extend entirely around the rollers, the latter having the fastest reducing speed. The partial reduced material is next engaged by the final reducing mechanism consisting of the plurality of rollers having the reduced intermediate portions above described.

The peculiar shape of the rollers for producing the final reduction produce a double action as they reduce the material at the relatively small points where they cross each other, and further reduce it at their larger bottom ends, which are arranged close enough to leave a smaller opening at the ends than the opening between the reduced portions of the rollers. The last mentioned rollers are corrugated the same as the uniform size rollers, and are rotated at a greater speed than the other roller mechanisms. Thus three sets of reducing devices are produced, and the rollers comprising each set are suitably mounted in ball bearings to reduce the friction, each set of the rollers being also mounted for adjustment, so that the distance between them may be regulated to control the size of the "sticks." If the final reducing rollers be adjusted to a sufficient extent outwardly, to increase the area of the space between them, the flow of the material will be correspondingly increased and cause it to be crowded through the lower opening and produce a triangular shaped stick, resembling a screw. If the lower ends of the lower series of rollers are formed without flutes, the results will be a triangular shaped stick, as the material will slip between the rollers at that point and not be be arranged by the action of the rollers, but will be discharged in triangular shape.

Suitable shaping mechanisms may also be employed in connection with the compressing and reducing rollers by which sticks of any required form may be produced, while the material is still warm.

After the material is finally reduced, it passes through a guide tube to a conveyer mechanism composed as before described, of a plurality of continuously moving diagonally arranged endless belts against a guiding cross-bar bearing lightly upon the belts, but rotatable and supported at its ends. The series of diagonal belts may be of any required length, but are generally of sufficient size to correspond with a guide plate about 10 feet long, so that each section of the reduced material will likewise be about ten feet in length, or correspond in length with the guide plate and the series of endless diagonal belts. The co-action of these belts and the guide member is to gradually move the section of reducing material longitudinally of the guide member and at the same time retain it in its twisted condition, and thus prevent the relatively warm material from untwisting, which it would have a tendency to do if it were not thus forcibly held in its twisted condition. The endless belt together with the holding bar form a combined conveyer and roller, rolling process being necessary, as before mentioned, to retain the twist in the reduced section of the material.

It is obvious that if the section of reduced material were conveyed over a straight belt or upon a stationary table without being rolled in the direction of the twist, it would untwist and the stripes thereon appear longitudinally instead of spirally. It is therefore necessary for the stick to be rotated relative to the twist as it is carried from the final reducer mechanism to the cooling table.

The guiding bar is wider than it is thicker, and is provided with a time actuated mechanism and is provided with two cutting blades at the end adjacent to the final reducing mechanism. When in position to guide the section of reduced material over the diagonal belts, it bears lightly upon the belts by its lower edge, and after the section of reduced material has traveled over all of the belts a timed device acting on the cross-bar imparts a semi-revolution thereto, thus releasing the section of reduced material which being previously held and guided over the belts, at the same time coacting with a cutting mechanism to sever the material which bears upon the diagonal belts from the material being forced through the discharge tube. The severed section passes beneath the rotating guide-bar, the latter being stopped when in a vertical and reverse position ready to receive the next section of material. The severed section is carried by the diagonal belts to the receiver side of the cooling table and is deposited upon the endless traveling belt thereon and conducted over the cooling table, as before described.

Stick candy made of "all pulled" candy has a tendency to "draw up" at the ends when severed while

in warm condition, causing the sticks to be thicker at the ends than the body of the stick. To overcome this tendency, it is necessary to stretch the material slightly to reduce their size, at the points where they are severed, this stretching action necessarily taking place at the same time that the material is severed, so that when the "drawing up" action occurs, it will be confined to this stretched portion, and thus produce uniform sticks, and to this end a suitably constructed stretching mechanism is arranged to coöperate with the severing mechanism, as hereafter described.

An approved construction of the mechanism employed for reducing the material into the required sizes of "sticks" is shown in the drawings forming a part of this specification and in which corresponding parts are denoted by the same designating characters, and in the drawings thus employed,

Figure 1 is a side elevation, partly in section, of the improved apparatus. Fig. 2 is a plan view of the improved apparatus. Fig. 3 is a plan view of the portion of the apparatus comprising the operating mechanism for the combined twisting reducing and severing mechanism. Fig. 4 is a detail of the operating mechanism for the fluted rollers. Fig. 5 is a plan view enlarged of the supported plate for the upper rollers illustrating the construction of the adjusting mechanism of the same; Fig. 6 is a sectional detail of the adjusting mechanism for the upper rollers; Fig. 7 is a sectional detail of the diagonal conveyer belts; Fig. 8 is a detail view of the mechanism for operating the stop bar; Fig. 9 is a detail of the operating mechanism for the intermediate rollers; Fig. 10 is an enlarged detail of one of the clutch devices for controlling the movements; Fig. 11 is a transverse section enlarged, on the line 11 of Fig. 1; Fig. 12 is a sectional side view, and Fig. 13 is a plan view of the adjusting plate for the intermediate rollers; Fig. 14 is a transverse section enlarged on the line 14—14 of Fig. 1; Fig. 15 is a detail of the operating mechanism for the reducing roller; Fig. 16 is a plan view of the adjusting mechanism for the lower rollers; Fig. 17 is a sectional detail of the adjusting mechanism for the lower rolls, and Fig. 18 is a perspective view of the combined, severing and stretching mechanism. Fig. 19 represents a side elevation of a chopping device designed for use with candy in a soft or pliable condition; Fig. 20 represents an elevation of a guiding device composed of two continuously revolving rollers coupled together; Fig. 21 represents an end view of the device shown in Fig. 20 showing the operating gears therefor; Fig. 22 represents a transverse section taken on line 22—22 of Fig. 20; Fig. 23 represents an elevation of a modified form of cutting device; Fig. 24 is a shaping device composed of 4 rollers with a one-quarter circular groove cut in the periphery of each and with the edges of the grooves beveled, said rollers being mounted in a frame in which the beveled edges fit snugly and its one-quarter vertical grooves form a perfect circle when they come together at the center; Fig. 25 is an elevation of a triangular stick shaper having three rollers arranged in the frame to form a triangular space between them; Fig. 26 is an elevation of a flat stick shaper having two rollers mounted in frames and operated by spur gears; Fig. 27 represents a side elevation showing a modified form of the machine; and Fig. 28 represents a cutting device for use with candy after it has become cold and brittle.

The improved mechanism for accomplishing the desired results and as illustrated in the drawings comprises a base frame represented as a whole at 10 and of suitable construction, and upon which the cooling table represented as a whole at 11 is supported, the latter being a hollow metal body through which cold water or other suitable cooling medium may be caused to pass.

Arising from the base frame 10 at one corner of the same is a frame work comprising vertical spaced members 12, preferably of angle steel and carrying upon their upper ends an angular head plate 13. The angular plate is formed with an angular rib surrounding the central opening, the rib having angular bearings 15 to receive bearing balls 16 spaced apart, as shown, and supported by these bearing balls is a ring 17 having a circular gear rack 18 upon its periphery.

Secured by bolts 19 upon the rib 14 is a bearing ring 20, which retains the upper series of bearings balls 16 in position, and thus likewise retains the angular gear member 17 in position together with the lower series of bearing balls 16. By this means, it will be obvious, that the angular gear member may be freely rotated upon the rib 14 with a minimum of friction.

Mounted for rotation in the plate 13 is a vertical shaft 21, and provided with a small gear 22 engaging the angular gear 17—18, the vertical shaft having a worm gear 23 upon its upper end, and coupled by a yoke frame 24 to a horizontal shaft 25, the latter having a worm pinion 26 engaging the worm gear 23.

Extending through the plate 13 adjacent to the annular gear 17—18 are studs 27 on which are fixed small gear wheels 28, the latter being spaced around the annular gear 17—18 and engaging the same, and serving as actuating means for the rollers 33 hereinafter described.

A shaft 25 is mounted in suitable bearings 29, in a ceiling or other stationary support, as represented at 30 and is adapted to be actuated in any suitable manner over the machinery below, as hereafter explained. By this means, it will be obvious that the motion imparted to the shaft will be transmitted to the annular gear 17—18, and likewise to the shaft 21, through the pinion 22, annular gear 17—17 and through it to the pinions 28 on the studs 27 of the coupling members 31 for operating the rollers 33.

Attached to the lower ends of each of the studs 27 and also to the lower end of the shaft 21 are the members 31 of the universal couplings, the members, as 32 of the couplings being attached respectively to the upper ends of a plurality of tapered fluted rollers 33, the lower smaller ends of the fluted rollers being disposed in relatively close proximity and overlapping each other to form a relatively small discharge space, as illustrated in Fig. 1. The flutes in the rollers 33 are uniformly spaced and converge toward the smaller ends, as shown. At their lower ends, the tapered rollers 33 are provided with central studs 34, rotatively engaging hubs 35 having transverse trunnions 36, the latter rotatively engaging frames 37 slidable in suitable guides 38 upon a transverse bed plate 39 connected to the frame members 12. Four of the tapered rollers 33 are shown, which will be the usual number employed, consequently four of the slidable frames 37 together with their swiveled hubs 35 are shown, each of the plates having a threaded stud 40 through which an operating screw 41 passes.

Arising from the plate 39 are a plurality of studs 42 corresponding in number to the operating screws 41, and in which the latter are mounted for rotation, each screw having a hand-wheel 43 at its outer end. By this arrangement, it will be obvious, that by rotating the screws 41, the lower ends of the tapered rollers 33 may be adjusted to any required extent. The plate 39 is provided with an aperture beneath the operating ends of the rollers 33, to provide a passage-way for the partially reduced material as it is fed from the tapered rollers, as hereafter explained.

Extending transversely from the frame members 12, and spaced below the plate 39 is another plate 44, and spaced from the plate 44 is another similar plate 45, each plate having a central aperture down through which the material passes in its course.

Arising from the plate 44 and secured in its central aperture is an annular rib 46 having spaced bearings on its upper face to receive bearing balls 47, the upper series of bearing balls being supported in position by bearing ring 48 secured to the rib 46 by bolts 49.

Rotatively engaging the rib 46 is a gear wheel 50 having bearings in its hub to engage the balls 47, the gear having both external and internal teeth, as shown at 51—52.

Mounted for rotation through the plate 44 are studs 53, each stud having a small pinion 54 upon its upper end above the plate 44 and engaging the internal gear 52 and with a universal coupling member 55 upon its lower end beneath the plate 44.

Arising from the plate 45 is an annular rib 56, and surrounding its central aperture, and rotative upon the plate 45 and around this rib is a plate 57 having spaced segmental slots 58 through which clamp screws 59 operate, the clamp screws threaded into the plate 45.

Formed upon the disk 57 are spaced sockets 60 in which bearing balls 61 are disposed.

Arranged between the plates 44 and 45 are rollers 62, each roller having a socket in its lower end to bear over the bearing balls 61 which rest in the sockets 60 on the disk 57, while the upper ends of the rollers are provided with universal coupling members 63 adapted to be engaged with universal coupling members 55 on the studs 53. By this means, it will be obvious that when the gear 50 is rotated, motion will be communicated through the small gears 54, studs 53 and universal couplings 55—63 through the rollers, the latter rotated upon balls 61.

The rollers 62 are disposed in inclined positions, and interlap at their lower ends, as shown, and are spaced apart at their lower ends for a less distance than the tapered rollers 33 are spaced, so that the material passing from the tapered rollers 33 to the smaller rollers 62 will be still further reduced, as hereafter explained. The rollers 62 are provided with longitudinal flutes in their outer faces, the flutes extending entirely around the rollers at their lower portions, and then gradually increasing in length toward the upper ends, so that the last flute only extends the whole length of the roller. By this means, the upper portions of the surface of the roller 62 are left smooth or without flutes, as represented, so that a certain amount of "slipping" space is provided which begins at the contact point of the rollers, where they cross each other and gradually increase toward the top of the rollers, this graduated slipping space preventing the wedging or choking of the material. If the rollers were smooth or unfluted for their entire length, they would slip on the material and fail to compress or reduce the same, while on the other hand, if they were fluted for their whole length, they would force the material too rapidly and cause an unnecessary strain on the rollers. By commencing the smooth unfluted surface at the point where the rollers cross, and dispensing with the grooves or flutes, gradually toward the upper ends of the rollers until one flute only extends the whole length of the rollers will cause the reducer mechanism to act gradually on the material and increasing its reducing capacity as the material grows smaller, each additional flute in the rollers increasing the speed of the reducing process, so that at the point where the rollers cross and the flutes extend entirely around the rollers, the latter have the fastest reducing speed, as will be obvious.

By providing the segmental slots 58 and the clamp screws 59 in the plate 57, the rollers 62 may be drawn toward each other or spaced further apart to increase or decrease the discharge space between the rollers, and thus increase or decrease the size of the material passing through.

Spaced from the plate 45 is another plate 64 and provided with a central aperture and an annular rib 65, the outer face of the rib having bearings to receive a spaced ball 66, and also provided with a bearing ring 67 secured in place by a bolt 68 to support the balls in position.

Bearing over the rib 65 is a gear wheel 69 having external gear teeth 70 and internal gear teeth 71, the gear 69 having bearings engaging the balls 66.

Mounted for rotation in the plate 64 are studs 72, having small gears 73 upon their upper ends engaging the internal gear 71 and with a universal coupling member 74 upon the lower ends below the plate 64.

Spaced below the plate 64 is another plate 75 having a central aperture surrounded by an annular rib 76, and rotative upon this rib and bearing upon the plate 75 is a disk 77 having spaced segmental slots 78, and clamp screws 79.

Disposed upon the plate 77 are spaced guide members 80, arranged in pairs and spaced apart, the pairs of guides corresponding in number to the rollers 82.

Bearing between each pair of the guide members is a socket 81 for supporting a bearing ball 81′ each socket having a threaded aperture to receive an adjusting screw 83, the latter mounted for rotation through a stud 84 on the plate 77 and provided with hand wheel 85. By this means, the sockets 81 may be adjusted radially of the disk 77, while the plate is adjusted rotatively relative to the plate 75 by the segmental slots 78 and clamp screws 79.

Arranged between the plates 64 and 75 are a plurality of peculiarly shaped rollers 82, each roller having a universal coupling member 87 upon its upper end for engaging the coupling members 74 of the studs 72, each of the rollers 82 also having a socket in its lower end for bearing respectively upon the balls 81′. By this means, it will be obvious that when the gear 69 is rotated, its motion will be imparted to the rollers 82.

The rollers 82 are formed with their intermediate portions reduced, reductions occurring relatively near their lower ends, as shown, and are arranged to inter-

lap at their lower portions, their nearest meeting points being opposite their smallest diameters. The rollers 82 are also provided with longitudinal flutes arranged similarly to the flutes in the rollers 62, that is to say that the flutes extend entirely around the rollers at their lower portions and gradually increase in length toward their upper portions, with one flute only extending the whole length of the rollers, thus leaving level smooth unfluted portions at the upper parts of each roller, the object being to increase the reducing capacity as the material grows smaller, in the same manner as the material is acted upon by the rollers 62, as before described. The peculiar shape of the rollers causes them to produce a total action, reducing the material first at their smallest diameters, or where they cross each other, and further reducing the material at their enlarged lower ends which run nearer together than at the smaller intermediate points. The space between the rollers 82 is adjusted by means of the segmental slots 78 and clamp screws 79 in the same manner as the rollers 62 are adjusted through the medium of the slots 58 and clamp screws 59, and in addition to this adjustment, the spaced guide members 80 and adjustable sockets 81 provide for a radial adjustment, as will be obvious.

Secured in the lower side of the plate 75, preferably by threading is a curved tubular member 88, forming the discharge means for the finally reduced material. A clamp screw 89 is arranged in connection with the plate 75 to bear upon the discharge member 88 to hold the latter firmly in position, and prevent accidental displacement thereof.

Mounted for rotation through the bearing plates 44—45, 64—75 is a vertical shaft 90 having a gear 91 for engaging the teeth 51 of the gear 50.

Mounted for rotation in the plate members 64—75 is a vertical shaft 130 having a gear 92 upon its upper end engaging the gear 69.

The worm pinion 26 and the worm gear 23 are so proportioned as to produce a certain pre-determined speed to the tapered rollers 33, while the relative sizes of the gears 91—92 are so arranged as to impart an increased speed of the rollers 62 over the speed of the rollers 33 and an increased speed of the rollers 86 over the rollers 62 when motion is imparted to the shafts 90 and 130. By this means, the material is forcibly drawn longitudinally at the same time that it is reduced in size, and twisted at the same time that it is drawn and reduced. The material is thus partially reduced and twisted by the rollers 33, still further reduced and twisted by the more rapid action of the rollers 62, and finally reduced and the final twist imparted thereto by the still more rapid action of the peculiarly formed rollers 86, and finally discharged in its completed form so far as the twist and reducing operation is concerned through the curved tube 88. The material is thus reduced, drawn, and twisted, and fed from the tube 88 in the form of a long stick, as hereafter explained.

Mounted upon the lower frame-work 10 are a plurality of diagonally disposed shafts 93, the shafts being arranged parallel and spaced apart and supported at their ends in bearings 94, the end shafts provided with relatively short drums 95—96 and the intermediate shafts provided with relatively long drums 97, the long drums being twice the length of the shorter drums.

Bearing over the shorter drum 95 and the adjacent end of the first longer drum 97 is an endless conveyer belt 98, and bearing over the remaining portion of the first long drum 97 and adjacent portion of the next long drum is an endless conveyer 99, and a similar endless conveyer 100 bears over the remaining portion of the second long drum and the adjacent portion of the last long drum. Bearing over the last short drum and the remaining portion of the 3rd longer drum is an endless conveyer 101. By this arrangement, a plurality of endless conveyer sections is found disposed at angles to the supporting frame-work and each also at an angle to the cooling table 11, the adjacent ends of the belts operating in close proximity, as shown. By this arrangement, it will be obvious that motion imparted to the first shaft 93, by the shaft next to the reducing and twisting mechanism, will be imparted simultaneously to all of the belts of the series.

Extending from the base frame 10 are standards 102—103, in which a shaft 104 is journaled, the standard 103 having a block 105 slidably disposed therein and in which the shaft 104 is journaled, the block being adjustable laterally by screws 106—107.

Connected upon the shaft 104 with one end spaced over the bearing 103 is a bar 108, preferably in flat form and bearing normally by one of its edges in close proximity to the diagonal conveyer belts above described. The bar 108 extends parallel to the cooling table 11, and is spaced therefrom, and adapted to be intermittently rotated one-half a revolution, so that the edges of the plate are disposed intermittently in close proximity to the diagonal conveyer belts.

Mounted for rotation in bearings 109—110 upon the frame 10 is a shaft 111 having a "half gear" or mutilated gear 112. Slidably disposed in suitable guide members 113 to the frame 10 is a bar 114 having a gear rack 115 thereon adapted to be engaged by the half gear 112.

The bar 114 is arranged to operate against ball bearings 116 in the guide member 113, to reduce the friction.

Mounted upon the shaft 122 is a ratchet wheel 117, the shaft 122 supported in bearings 123—124 upon the frame 10.

Connected to the bar 114 is a pawl 118 adapted to engage the teeth of the ratchet wheel 117.

Swinging upon the shaft 122 adjacent to the ratchet wheel 117 is a slotted arm 119 and coupled to the bar 114 by a pin 120 passing through its slot.

A spring 121 is connected between the arm 114 and the stationary guide 113, and operates to maintain the bar and its attached pawl yieldably in its withdrawn position. By this arrangement, when the shaft 111 is rotated, the half gear 112 will pick up the arm 114 and move it outwardly and extending its spring 121 and withdrawing the pawl 118, and then as the teeth of the half-gear release the ratchet teeth 115, the spring will actuate the bar 114 and rotate the ratchet wheel a distance equal to the movement of the bar 114.

Mounted upon the shaft 122 is a gear wheel 123, and mounted upon the shaft 104 is a small gear 124, the two gears 123—124 being so proportioned that at each movement of the bar 114, the shaft 104 will be rotated one-

half a revolution and thus reverse the position of the plate 108, the object being hereafter explained.

The main drive shaft of the apparatus is represented at 125, and is mounted in suitable bearings 126—127 upon the frame 10.

The shaft 125 is provided with a beveled gear 128 engaging a like beveled gear 129 on the first or adjacent diagonal shaft 93, by which means, motion is imparted to the series of diagonal conveyers.

Carried by the shaft 125 is another beveled gear 131 engaging a similar beveled gear 132 on the lower end of the shaft 130, by which motion is imparted to the latter.

Mounted upon the shaft 125 is another beveled gear 133 engaging the beveled gear 134 upon the vertical shaft 90 by which motion is imparted to the latter. The shafts 90 and 130 are provided respectively with coupling clutches 135—136, to enable the shafts to be drawn in and out of gear, so that the movements of the combined reducing and twisting mechanism may be controlled, as hereafter explained.

Mounted to swing at 137 upon the frame-work 10 adjacent to the discharge tube 88 is a bar 138, and provided with two arms 139—148, the arm 139 extended laterally as at 140 and terminating adjacent to the bar 108.

One end of the bar 108 is provided with two cutting members 141—142 at diagonally opposite sides. The arm 148 terminates in a shearing or cutting member 143 for coöperation alternately with the cutting members 141—142, to sever the "stick" of the material.

The arm 148 is provided with an extension 144 terminating in a roller 145, while the arm 139 is provided with a projection 146 against which the roller bears when the two arms are in position. The arms 139 and 148 are also connected by a spring 147, and the bar 138 and the arm 148 is still further coupled by a spring 149.

Pivoted at 150 upon the arm 148 is a stretcher member 151 having a projection 152 which travels a little ahead of the cutter 143 on the arm 148, and engages the "stick" of material and pushes it forward while at the same time, a stretcher on the bar 108 strikes the stick from the opposite side pushing a portion of the stick, in the opposite direction of the stretcher 152. This stretching occurs just previous to the cutting of the stick. The bar 108 is provided with projections as 108′ which travel ahead of these cutters 141 and 142 and serve as stretchers; the sticks being soft they stretch readily when engaged by the two stretchers and as soon as the candy is stretched and cut, the arm 148 with this stretcher will be drawn back again by the spring 149 ready for the next operation. It will be seen that if the projection 152 on the arm 148 travels one way forcing the stick with it and the projection 108′ on the bar 108 travels the opposite way forcing a portion of the stick in the opposite direction the stick will stretch between the oppositely moving projections or stretchers.

It is well known that when candy and like compounds or productions is severed in its warm state, the severed ends increase in size slightly by a shrinkage, as the material when being manufactured is stretched to a greater or lesser extent, and to avoid this shrinkage from affecting the size of the material is the object of the mechanism just described, and its action is as follows:—As the stick of material is forced from the tube 88, it is carried over the diagonally disposed conveyer belts and against the outer side of the bar 108, the belts by their constant rotation maintaining the "stick" of material pressed against the member 108, at the same time rotating beneath it, and thus maintaining the stick in its twisted condition as it is moved over the conveyers. The mechanism for reversing the position of the member 108 is so timed that it will operate just as the free end of the "stick" reaches the outer end of the guide member 108, each in close proximity to the bearing 103, and as the member 108 is reversed in position, it will strike the free end of the arm 139 and move it outwardly and thus cause the arm 148 to move longitudinally to enable its cutting end 143 to coact with the cutting members 141—142 as the case may be to sever the "stick".

Disposed at opposite sides of the cooling table 11 are shafts 156—157, the shaft 156 having a beveled gear 158 thereon.

Mounted for rotation in bearings 159 on the table 10 is a shaft 160 having a beveled pinion 161 at one end engaging the beveled gear 158, and with a beveled pinion 163 upon a vertical shaft 164, the latter having a worm gear 165 adapted to be engaged by a worm pinion 166 upon the main shaft 125. By this means, the motion of the drive shaft is imparted to the cooling table shaft 156.

Mounted upon the shaft 156 are chain wheels 167—168, and mounted upon the shaft 157 are chain wheels 169, the chain wheels being located at opposite ends of the cooling table and each opposite pair connected respectively by chains 171—172. Chains are connected with spaced slats 173 which run transversely of the cooling table.

The diagonally disposed belts 98, 99, 100 and 101 produce angular recesses between their inner ends. Adjacent the side of the cooling table, and in these angular spaces, are arranged relatively small conveyer belts 174, 175, 176, 177 and 178. The inner ends of the smaller belts are in alinement adjacent to the cooling table, while the outer ends of the belts 174, 175 and 176 are also in alinement. The belts are all mounted upon shafts at their ends which are in turn supported by suitable bearings from the frame 10. The shafts of the belts 174, 175, 176 and 178 adjacent to the diagonal belts are extended into these belts and provided respectively with smaller drums indicated at 179, 180, 181 and upon which the upper sides of the diagonal conveyer belts operate to transmit their motion to the smaller belts. The outer shaft of the belt 183 of the smaller belt 177 is extended as shown and supported by bearing 184 and provided with a gear pinion 185 adapted to be engaged by a gear wheel 186 on the outer end of the shaft 156, by which motion is imparted to the belt 177, so belts 177 and 183 move in the right direction. The smaller conveyer belts above noted do not occupy all of the angular spaces between the larger diagonal conveyer belts and the cooling table, and these angular spaces are filled by angular plates 187, as shown to prevent the warm sticks of material from sagging after they are passed to the cooling table. The warm severed sticks of material are carried to the cooling table and deposited in position to be caught by the moving slats 173 and carried thereby slightly over the cooling table.

The various steps of the mechanism will be so arranged that the severed "sticks" of the material will be carried after their release from the member 108 to

the cooling table during the period of time that the next "stick" is being formed and deposited upon the diagonal belts, and the speed of the endless belts or slats 173 will be so gaged as to maintain a continuous stream of the severed sticks upon the cooling table, as will be obvious.

At the outer edge of the cooling table, a guard member 188 is disposed against which the cooled sticks of material are carried by the slotted belt, and prevented thereby from being prematurely discharged.

Mounted for rotation at the discharge side of the cooling table is a receiver 189 having a projection 190 along the outer sides, the receiver 189 adapted when in one position to receive the cooled sticks of material as they fall from the conveyer belt, the elevation side 190 of the receiver serving to prevent the sticks from passing over the receiver.

Supported for oscillation by standards 191 is a shaft 192 having thereon a plurality of severing devices by means of which the cooled sticks of the material are cut up into the required lengths or sticks of commerce. The severing devices will be spaced at any required distances apart to produce smaller sticks of any required length, and any number may be employed. Each of the severing devices consists of an arm 193 extending from a collar 194 upon the shaft 192, and adjustably supported by a set screw 196, each arm having a depending knife or cutter 197 at its free end, adapted to engage the long cooled sticks of material when in position upon the receiver 189 and sever them into the required shorter lengths. It is requisite that the operations of the severing knives 193 shall be exactly timed to correspond with the movements of the cooler belt on the cooling table and the mechanism for producing the necessary movements consists in a gear wheel 198 upon the shaft 157 engaging a smaller gear wheel 199 on a stud shaft 200, the latter mounted in suitable bearings 201.

The adjacent end of the shaft 192 is provided with a crank arm 202, and swinging from this crank arm is another arm 203 suitably connected at its free end as at 204 and provided with a lug 205 extending into the path of a stud 206 carried by the stud shaft 200, the arm 203 having a spring 207 operating to maintain it yieldably in its withdrawn position, the operation of the spring also serving to hold the shaft 192 and its clipping members 193 in in-operative position. The receiving member 189 is supported yieldably in its operative position by a spring 208 and is connected by a rod 209 to a crank arm 210 on a similar shaft 211, the latter having a spring controlled stop member 212 extending into the path of a lug 213 extending from the arm 203. The lug 212 is arranged to rotate freely on the shaft 211 when moved in one direction and pick up the shaft and carry it forward when moved in the opposite direction. By this means when the arm 203 is picked up by the coaction of the lug 205 and the stud 206, the cutter members 193 will be depressed and sever the cooled sticks of material lying upon the receiver into the shorter sticks, the outward movement of the arm 203 passing the spring supported member 212 without producing any effect, but when the stud 206 passes the lug 205 and releases the arm 203, the return movement produced by the reaction of the spring 207 will cause the lug 213 to engage the member 212 and rotate the shaft 211 for a portion of a revolution and thus correspondingly tilt the receiver 189 through the action of the crank arm 210 and rod 209, and discharge the severed sticks upon an inclined plate 213′ from which it may be conveyed to suitable receptacles. The upper surface of the receptacle 189 is provided with spaced transverse ribs, or the surface formed into corrugations as shown at 214, to prevent the sticks of material from sticking to the receiver. The reducing rollers 33, 62, and 82 may require to be heated when employed in reducing certain kinds of candy or other material, and to this end a system of gas pipes is represented at 215 with a branch leading to each set of the rollers and terminating in a burner adjacent thereto.

The apparatus thus far described is adapted to form circular twisted and triangular twisted sticks of candy, but may be readily adapted to form sticks of other forms by substituting for the rollers 82, a suitable form of mechanism adapted to compress material into the required shape.

In Fig. 24 is shown the arrangement which will be employed when untwisted circular sticks are to be produced consisting in arranging a frame 216 between the plates 64 and 75, after the removal of the rollers 82 and their adjusting mechanism, the frame 216 having a plurality of rollers 217 journaled therein with grooves in their rims adapted when in coacting position to draw the material into a relatively small round configuration. The rollers 217 are provided with inter-engaging beveled gears 218, by which the rollers are operated simultaneously when motion is imparted to one of the shafts of one of the rollers, this shaft being represented at 219 and extended to receive a beveled gear 220 operated by a similar beveled gear on the shaft 130.

In Fig. 25 is shown a mechanism similar to the mechanism shown in Fig. 24, whereby untwisted sticks of triangular shape may be produced, this modified structure consisting in a frame 222 supporting three rollers 223 having flat perforations which coact to produce a triangular shaped stick of the material when arranged in the frame, as shown.

The rollers 223 are provided with inter-engaging beveled gears 224, the shaft of one as at 225 being extended to receive a beveled gear 226 adapted to be engaged by the beveled gear 221 on the shaft 130, as shown.

In Fig. 26, a mechanism is shown for producing sticks of the material in flat or oblong form in transverse sections consisting in a frame 227 carrying rollers 228—229, and adapted to be simultaneously operated by inter-engaging gears 230, and the shaft 231, one of the gears being extended and carried with the beveled gear 232, adapted to engage the beveled gear 221 on the shaft 130. The roller 228 is adjustable in the frame 227 by screws 233, so that the space between the rollers may be regulated to increase or decrease the size of the material fastened to it.

In Fig. 20 a modified construction of the guide member 108 is shown, consisting of spaced rollers or rods 234—235 connected at the ends in heads 236—237, the head 236 having cutting members 241—242 attached thereto in the same manner and for the same purpose as the like devices shown in Figs. 1 and 2. The journals of the rollers 234—235 are extended through the

head 237 and provided with small gear wheels 238—239, while the shaft 240 on which the heads are mounted, and which corresponds to the shaft 104 of the structure shown in Figs. 1 and 2, is provided with an intermediate gear 241 with which the gears 238 and 239 operate. By this means, when the shaft 240 is reached, the rollers 234—235 will be correspondingly rotated, as will be obvious, the object being to impart a slight rolling motion to the stick of material as the guide member is actuated to release and sever the stick.

In Fig. 23 is illustrated a modified construction of the device for severing long cooled sticks into smaller lengths, consisting in substituting for the shaft 192, and its cutting members 193 and other adjustments, a pair of spaced shafts 242—243 mounted for rotation below the discharge ends of the cooler table conveyer belt, the shafts being provided with spaced cutting blades 244—245. The cutting blades are mounted upon the heads 246—247, provided with set screws 248—249 by which they may be clamped in position upon their respective shafts and adjusted longitudinally thereof, to gage the sizes of the sticks to be severed. The shaft 242 is adapted to be continuously and rapidly rotated by gearing 249—250 from the shaft 157 of the cooling table conveyer mechanism. By this arrangement, as the long cooled sticks of material fall one after the other from the conveyer belt of the cooling table, they are received by the revolving cutters 244 and quickly severed by the co-action therewith of the cutting members 245 and fall from this into suitable receptacles. It will thus be obvious that a very complete and simple structure is produced whereby a batch of material, as for instance, candy or the like is reduced into stick form, twisted simultaneously with its reduction, and severed into the small sticks of commerce, all of the movements and operations being automatic, and none of them requiring the intervention of manual labor, or to be handled by the operators.

The improved apparatus occupies a comparatively small space, and will require a comparatively small power to operate it. The whole device is operative from one single main shaft 125, the shaft 25 being operative from the shaft 125 in any suitable manner, preferably by a chain or belt leading from a pulley 251 on the shaft 125 to a pulley 252 on the shaft 25.

The forms shown in Figs. 25 or 26 may be arranged in series directly under the hopper after rollers as 62 and 82 have been removed as shown in Fig. 27.

Having thus described my invention, what I claim as new is:—

1. In an apparatus of the class described, a receptacle for the material; means for simultaneously reducing and twisting said material, a plurality of diagonally disposed conveyer devices for receiving said reduced and twisted material, a guide member extending over said conveyer device and against which the reduced and twisted material is maintained, means for severing the reduced and twisted material into sections at certain pre-determined intervals, a cooling device disposed in position to receive the severed sections, means for discharging the sections from said said cooling device, and means for dividing the sections into smaller lengths.

2. In an apparatus of the class described, a receptacle for the material, means for simultaneously reducing and twisting said material, a plurality of diagonally disposed conveyer devices for receiving said reduced and twisted material, a guide member extending over said conveyer device and against which the reduced and twisted material is maintained, means for severing the reduced and twisted material into sections at certain pre-determined intervals, a cooling device disposed in position to receive the severed sections, means for discharging the sections from said cooling device, and means for dividing the sections into smaller lengths.

3. In an apparatus of the class described, a receptacle for the material, means for simultaneously reducing and twisting said material, a plurality of diagonally disposed conveyer devices for receiving said reduced and twisted material, a guide member extending over said conveyer device and against which the reduced and twisted material is maintained, means for severing the reduced and twisted material into sections at certain pre-determined intervals, a cooling device disposed in position to receive the severed sections, a receiver for the sections, means for discharging the sections from said cooling device into said receiver, means for dividing the sections while in said receiver into shorter lengths, and means for discharging the divided material from the receiver.

4. In an apparatus of the class described, a receptacle for the material, means for simultaneously reducing and twisting said material, a plurality of diagonally disposed conveyer devices for receiving said reduced and twisted material, a guide member extending over said conveyer device and against which the reduced and twisted material is maintained, means for severing the reduced and twisted material into sections at certain pre-determined intervals, a cooling device disposed in position to receive the severed sections, a receiver for the sections adapted to be tilted, means for discharging the sections into said receiver, means for dividing the sections into smaller lengths while in said receiver, and means for tilting said receiver to discharge said divided lengths therefrom.

5. In an apparatus of the class described, a plurality of tapered fluted rollers with their lower smaller ends interlapping and adapted to be simultaneously rotated, to reduce and twist the candy conveyed thereto a plurality of rollers arranged in inclined relative positions below said fluted rollers and interlapping at their lower ends, to further reduce the candy conveyed thereto from said fluted rollers and means for rotating said inclined rollers at a greater speed than the tapered rollers.

6. In an apparatus of the class described, a plurality of tapered fluted rollers adapted to be rotated and with their lower smaller ends interlapping, to reduce and twist the candy conveyed thereto a plurality of rollers arranged for rotation in inclined relative positions below said tapered rollers and interlapping at their lower ends, said inclined rollers having spaced longitudinal flutes extending entirely around them at their discharge ends and gradually increased in length toward the receiving ends, and means whereby said inclined rollers are rotated at a greater speed than the tapered rollers said inclined rollers being adapted to receive the candy from the tapered rollers and still further reduce it and form spiral grooves in the surface thereof.

7. In an apparatus of the class described, a plurality of tapered fluted rollers adapted to be rotated and with lower smaller ends interlapping, below said tapered rollers a plurality of rollers arranged for rotation in inclined relative positions and interlapping at their lower ends, said inclined rollers having spaced longitudinal flutes extending entirely around them at their discharge ends and gradually increasing in length toward the receiving ends said inclined rollers being adapted to receive the candy from the tapered rollers and still further reduce it and form spiral grooves in the surfaces thereof.

8. In an apparatus of the class described, a receptacle for the material, means for reducing and twisting said material, a plurality of diagonally disposed conveyer devices for receiving said twisted and reduced material, a guide member extending over said conveyer devices and against which the reduced and twisted material is maintained, and means for severing the reduced and twisted material into sections at certain pre-determined intervals.

9. In an apparatus of the class described, a receptacle for the material, means for reducing and twisting said material, a plurality of diagonally disposed conveyer devices for receiving said twisted and reduced material, a guide

member mounted for rotation and extending over said conveyer device and with cutting members at one end, a cutting device adapted for coöperation with the cutting members of said guide member, means for intermittently operating said guide member, and means for actuating said cooperating cutting device simultaneously with the cutters of said guide member, whereby the reduced and twisted material is divided into sections at certain pre-determined intervals.

10. In an apparatus of the class described, tapered fluted rollers with their lower smaller ends interlapping, a plurality of rollers adapted to receive the material discharged from the tapered rollers and having parallel sides and arranged in relatively inclined positions and interlapping at their lower ends, a plurality of rollers reduced intermediate their ends and rotated in relatively inclined positions and interlapping at their smaller diameters and adapted to receive the material from the parallel sided rollers, means for simultaneously rotating said tapered rollers, means for simultaneously rotating said parallel sided rollers at a greater speed than the tapered rollers and means for simultaneously rotating said intermediately reduced rollers at a greater speed than the parallel sided rollers.

11. In an apparatus of the class described, a plurality of tapered fluted rollers with their lower smaller ends interlapping, a plurality of rollers adapted to receive the material discharged from the tapered rollers and having parallel sides and arranged in relatively inclined positions and interlapping at their lower ends, said parallel sided rollers provided with spaced longitudinal flutes extending entirely around them at their discharge ends and gradually increasing in length toward the receiving ends, a plurality of rollers reduced intermediate their ends and arranged in relatively inclined positions and interlapping at their smaller diameters and adapted to receive the material from the parallel sided rollers, said intermediately reduced rollers provided with spaced longitudinal flutes extending entirely around them at their discharge ends and gradually increasing in length toward the receiving ends, means for simultaneously rotating said tapered rollers, means for simultaneously rotating said parallel sided rollers at a greater speed than the tapered rollers and means for simultaneously rotating said intermediately reduced rollers at a greater speed than the parallel sided rollers.

12. In an apparatus of the class described, a receiver for the material, means for reducing said material, a receiver for said reduced material, means for severing said reduced material into relatively long sections at certain pre-determined intervals, a cooling device disposed in position to receive the severed sections, means for discharging the sections from said cooling device, and means for dividing said relatively long sections into smaller sections.

13. In an apparatus of the class described, a receiver for the material, means for reducing said material, a receiver for said reduced material, means for severing said reduced material into relatively long sections at certain pre-determined intervals, a cooling device disposed in position to receive the severed sections, means for discharging the sections from said cooling device, a receiver for the sections when discharged from the cooling device, a plurality of spaced severing devices adjacent to said receiver, means for intermediately operating said severing devices, and means for intermittently discharging the severed material from said receiver.

14. In an apparatus of the class described, a receiver for the material, means for reducing said material, a receiver for said reduced material, means for stretching said reduced material at certain pre-determined intermediate points, and means for severing said reduced material while in its stretched condition.

15. In an apparatus of the class described, a receiver for the material, means for reducing said material, a receiver for said reduced material, means for stretching said reduced material at certain pre-determined intermediate points, a cooling device, means for severing the material means for conveying said severed sections over said cooling device, and means for dividing said relatively long sections into smaller sections.

16. In an apparatus of the class described, a receiver for the material, a plurality of tapered rollers with their ends interlapping and operating to reduce the material, a conveyer device for conducting the reduced material from said rollers, and means for simultaneously stretching and severing the reduced material at certain pre-determined intervals.

17. In an apparatus of the class described, a receptacle for the material, a plurality of tapered rollers with their lower smaller ends interlapping and operating to reduce the material, conveyer devices for conducting the reduced material away from said rollers means for engaging the reduced material while warm and stretching the same at certain pre-determined intervals, and means for severing the material while in its stretched condition.

18. In a candy machine, the combination of a reducing batch holder or hopper, a plurality of graduating reducing devices arranged in vertical alinement with each other, a delivery tube under the last reducing member, a conveyer in one end under the delivery tube, a guiding member on the conveyer, a plurality of auxiliary conveyer belts arranged at the ends of the conveyer, a cooling conveyer, a cooling table, a stick receiving bar, a plurality of chopping blades, supports, and means for operating the several parts of said machine for the purpose set forth.

19. In a candy machine, a reducing batch holder comprising a plurality of conical shaped corrugated rollers revolubly mounted in a vertical position with their lower ends twisted around each other, a bottom plate on which are mounted adjustable bearings supporting the bottom ends of the rollers, a top plate supporting the top ends of the rollers, a universal coupling mounted on the top ends of each roller, a shaft extending through said rollers, a pinion keyed on the universal coupling shaft, and an annular gear mounted on the top plate engaging the roller pinions.

20. In a candy machine, the combination of a batch-holder to receive the batch of candy to be shaped and reduced, a plurality of graduating reducing twisters arranged in vertical alinement under the batch holder, to reduce and twist the candy, a delivery tube under the last reducing twister which guides the reduced and twisted candy to a moving conveyer under the delivery tube, a revoluble guiding device which extends diagonally across the conveyer or carrier, guiding the stick as it leaves the delivery tube across the conveyer, a plurality of auxiliary conveyer belts at the delivery end of the conveyer to carry the sticks to the cooling conveyer, a cooling conveyer which carries the sticks over a cooling table, a cooling table underneath the cooling conveyer, a cutting device at the delivery end of the cooling conveyer, a guide plate over the delivery end of the cooling conveyer, an apron underneath the cutting device, supports and means for operating the different parts as set forth.

21. In an apparatus of the class described, a receptacle for the material, means for reducing said material, a plurality of diagonally disposed conveyer devices for receiving said reduced material, a guide member extending over said conveyer device and against which the reduced material is maintained, means for severing the reduced material into sections at certain pre-determined intervals, a cooling device disposed in position to receive the severed sections, means for conveying the severed sections over said cooling device, and means for dividing the sections into smaller lengths.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDWARD J. JENNER.

Witnesses:
T. E. WOOD,
E. HEILLRON.