March 28, 1944. A. MARTIN 2,345,139

GENEVA DRIVE

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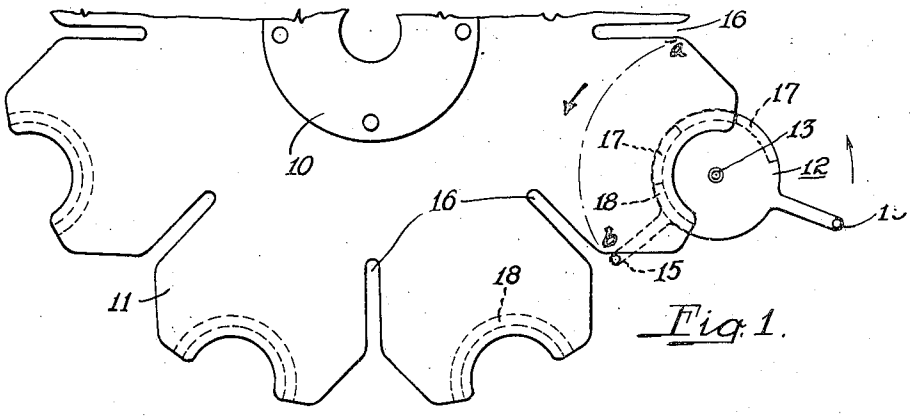


Fig. 1.

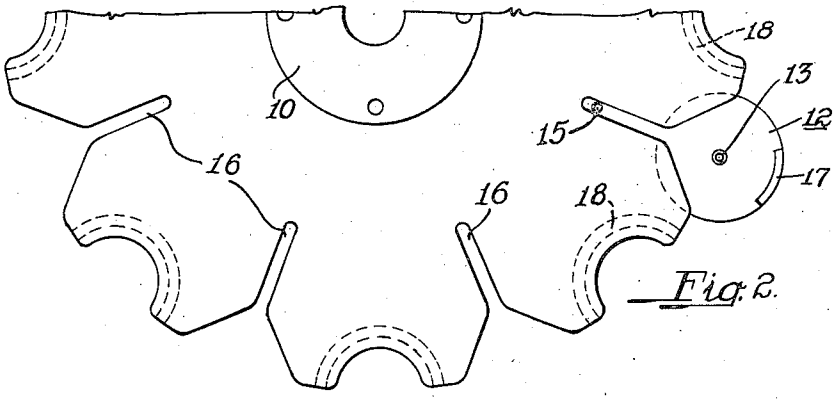


Fig. 2.

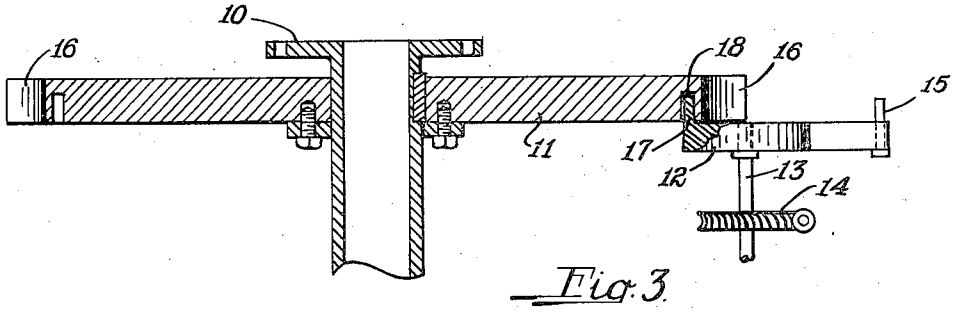


Fig. 3.

INVENTOR

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GENEVA DRIVE

Archworth Martin, Pittsburgh, Pa.

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2 Claims. (Cl. 74—436)

In Geneva gear drives, the pinion shaft makes a complete revolution for each step which the Geneva gear is moved. Ordinarily, if the pinion makes one revolution in two seconds, for example, the gear will be held at a position of rest for one second and will be moving during the other one second period.

The purpose of the present invention is to so form the Geneva drive that the gear will be moved more quickly relative to the periods of dwell than in the case of conventional Geneva gears. That is to say, instead of the driven gear being at rest during 180° of pinion revolution and being in motion during the other 180° of such revolution, it may occupy a period of rest during the time that the driving pinion is rotated 240°, the motion of the driven gear wheel being effected during 120° of pinion movement.

This arrangement is of utility particularly in the case of glass forming machines, where certain periods of dwell or pause are required in order to complete the shaping of the ware. By my arrangement, the pinion can be driven more rapidly, so that while the proper duration of dwell is secured, the Geneva gear and the mold table driven thereby are moved more rapidly between such periods of dwell, to thereby permit the performing of a greater number of shaping or molding operations per minute.

Figure 1 is a plan view showing approximately one-half of the driven gear wheel and the pinion, at a dwell position; Fig. 2 shows the positions occupied by the parts at an intermediate stage in the step movement, and Fig. 3 is a vertical sectional view through the apparatus of Fig. 1.

As shown in the drawing, 10 represents a mold column upon which a suitable mold table may be mounted and above which glass-shaping elements may be provided to operate upon glass within the molds, in timed relation to rotative movements of the mold table and the Geneva gear. The Geneva gear is represented by the numeral 11 and is suitably keyed to the column 10. It is intermittently rotated by a Geneva pinion 12 that is mounted on a shaft 13 that is driven from a suitable source of power through a worm gear 14 or the like. The pinion has a tooth 15 which periodically enters slots 16 in the gear 11, to impart step-by-step movement thereto. The pinion also has a curved boss 17 which is of somewhat the usual form, but instead of extending 180° is of considerably less length. The length and position of the boss 17 is such that it will completely emerge from a groove 18 in the Geneva gear wheel when the tooth 15 is entering one of the slots 16. The boss will enter the groove 18 when the stud 15 emerges from one of the slots 16 at the completion of a step movement of the gear 11 (as indicated by dash lines in Fig. 1), and will maintain the gear wheel and therefore the mold table in stationary position, to permit the performing of shaping operations on the mold table, until the tooth 15 is carried into a succeeding slot 16 to advance the mold table another step.

As shown on the drawing, the movement of the gear wheel 11 is effected during approximately 120° of movement by the pinion 12 (from *a* to *b*) and the duration of dwell or rest is for 240° of pinion movement.

If now the drive is applied to a molding machine that previously had been driven by conventional Geneva gearing at a rate to produce 30 articles of ware per minute, which means that the pinion was rotated one revolution in two seconds, the rate of rotation of the pinion can be increased more than 16 per cent without reducing the dwell period, since there will be a saving of time required for moving the mold table. Instead of 30 pieces of ware per minute, 35 pieces per minute can be produced.

It will be understood that other relative periods of movement and dwell during each cycle of pause and movement can be had by changing the length of the solts 16, the radial position of the pinion tooth 15 and the length of the boss 17. For example, by extending the tooth-engaging walls of the slots 16 further toward the periphery of the gear wheel 11 and moving the tooth 15 correspondingly closer to the axis of the pinion, the pinion will operate to move the gear wheel during a greater portion of the pinion travel, with corresponding slower movement of the table. In such case, the length of the groove 18 would have to be decreased or the boss 17 shortened, so that the boss 17 would be clear of the groove whenever the pinion is in one of the slots 16.

While a simple curved recess could be provided in the edge of the table for a dwell surface, as is common in Geneva gears, the use of a relatively short boss such as 17 renders the groove 18 desirable in order to avoid danger of the table drifting in either direction during the dwell period.

The groove 18 is shown as approximately semicircular, but can be shortened to less than 180° if the boss 17 be correspondingly lengthened.

The combined length of each groove and the boss is less than the 360° length employed in prior art devices.

I claim as my invention:

1. A Geneva drive comprising a Geneva pinion having a radially-extending portion provided with a gear-driving tooth and also having an arcuate boss that is coaxial with the pinion and located diametrally opposite to the said tooth, and a gear wheel having radially-extending thrust surfaces positioned to be successively engaged by said tooth, during rotation of the pinion and also having arcuate grooves whose side walls serve as dwell surfaces, curved complementally with the boss and disposed between the thrust surfaces in position to be successively engaged by said boss, the boss having a length of substantially less than 180 degrees and the arcuate grooves being approximately semi-circular, each thrust surface being movable into the path of the tooth only such distance that it will be engaged by the tooth when the boss leaves a preceding groove and will be pushed by the tooth from said path when the boss enters a succeeding groove.

2. A Geneva drive comprising a Geneva pinion having a radially-extending portion provided with a gear-driving tooth and also having an arcuate boss that is coaxial with the pinion and located diametrally opposite to the said tooth, and a gear wheel having radially-extending thrust surfaces positioned to be successively engaged by said tooth, during rotation of the pinion and also having arcuate grooves whose side walls serve as dwell surfaces, curved complementally with the boss and disposed between the thrust surfaces in position to be successively engaged by said boss, the combined lengths of the boss and each groove being not substantially greater than 240 degrees, each thrust surface being movable into the path of the tooth only such distance that it will be engaged by the tooth when the boss leaves a preceding groove and will be pushed by the tooth from said path when the boss enters a succeeding groove.

ARCHWORTH MARTIN.