Use of Unitool Method With the Unitool Method, a single cutter of each standard diameter is used for cutting a wide variety of spiral bevel, Zerol bevel and hypoid gear ratios. The method is intended for cutting gears in small quantities and is particularly useful where experimental gears are needed for prototype models. Since the method is based on just six standard cutter diameters, only a minimum of tooling is needed, and the calculations are comparatively short and do not require specially trained personnel. The gear member of the Unitool pair is produced on the No. 116 Generator with or without generating roll and the mating pinion is generated to run correctly with the gear.

FEATURES

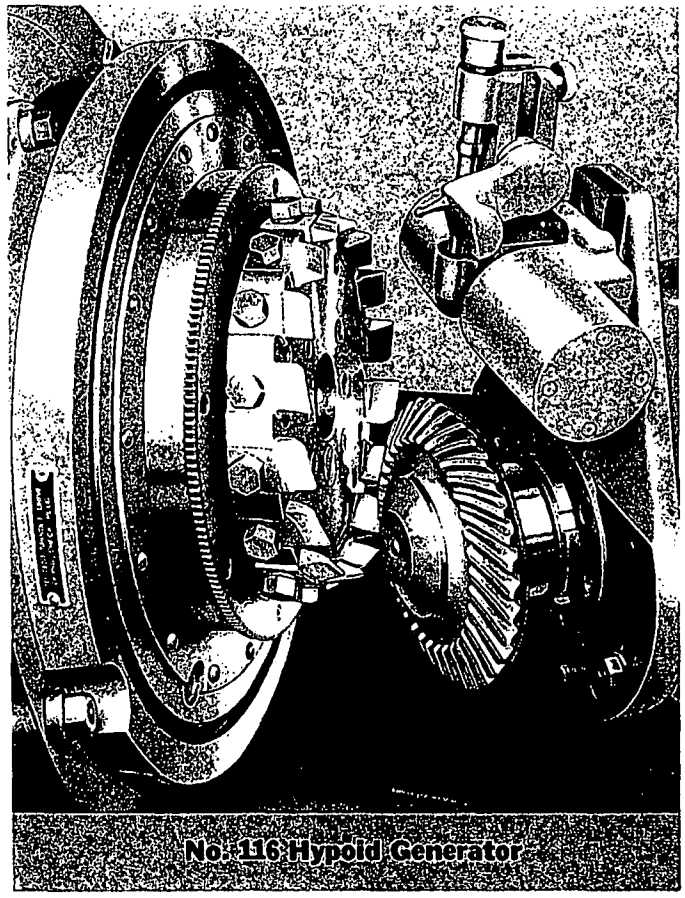
An entirely new type of cam-actuated generating and feed mechanism and universal cutter tilt are two outstanding features of the No. 116 Hypoid Generator. These, coupled with the increased rigidity of design and construction, contribute to the improved quality of product and efficient cutting cycles of this machine.

The No. 116 Generator is equipped with a double path feed cam – one path is used for roughing and finishing gears by the Formate-Unitool method; the second path is used for rough and finish cutting both gears and pinions using the standard generating roll.

As mentioned earlier, variable rate-of-roll cams can be provided for increased cycle efficiency (at some cost in versatility) in high production situations. When production is high enough to justify separate pinion machines for finishing the drive and coast sides, a further refinement is possible: the machine can be equipped to cut on the up-roll only, or the down-roll only, depending on which side of the pinion tooth it will cut. In such cases the stresses on machine, cutter, and work are always in the most favorable direction for quality and long life.

The cutter spindle adjustments have been designed to provide universal cutter tilt (30° in all directions), at the same time giving maximum rigidity to the spindle mounting. The cutter center does not move when the cutter axis is tilted, as shown in diagram on opposite page. This tilt takes place about an axis which intersects the cutter axis and lies in the plane of the blade points, resulting in simplified calculations and fewer adjustments when position or shape changes in the tooth bearing are made.

All moving parts on this machine are fully enclosed and automatically lubricated. Automatic safety features are provided wherever necessary. Push button stations are suitably located so that the machine can be controlled from various operating positions.



No. 116 Hypoid Generator

OPERATION

A circular face-mill type cutter is used on the No. 116 Hypoid Generator as shown above.

The tooth profile shape is produced by the generated method in which a relative rolling motion takes place between the gear and the rotating cutter. The action is as though the gear being cut were rolling with the mating crown gear of which the cutter represents a tooth. Once the gear is chucked in the work head, the machine operation is entirely automatic.

With the machine arranged for generating roll cutting, the feed cam moves the work head and gear into cutting position. The cradle on which the cutter is mounted then rolls in timed relationship with the work spindle to generate a tooth space. At the completion of one tooth