The Hobbing Process. — The bobbing process as applied to straight-cut gears has proved very successful, and it is not difficult to understand why this process has sprung into prominence in a comparatively short time. It is essentially a rational process. The shape of the teeth is generated from spiral hobs, the threads of which are cut to a plain rack section. One hob will cut any gear or pinion of one pitch. This feature alone eliminates a great many errors, which are characteristic of gears produced by milling methods. The hob revolves continuously while cutting, as does the gear blank. The feed is also continuous. There are no cutting and return strokes, and no intermittent starting and stopping of gear blanks, as in other generating processes. These features do not necessarily insure the production of accurate gears, but they offer greater facilities to the designer for the achievement of the desired result.

The hob is a substantial tool with plenty of wearing and cooling surface, and can be made to meet the demands of rapid production and to last for a long time. The continuous nature of all motions used in hobbing a gear blank enables this process to be used for the production of the heaviest gears. The limit to the size of a hobbing machine is set by the dimensions of the largest gears, which are required in sufficient quantities to pay for the investment.

Nevertheless, there are some defects in the hobbing process as applied to the production of straight-cut spur gears. A hob is a worm thread, and as such must have a spiral angle depending on the relationship between the pitch of the thread and the diameter of the hob. A straight-cut gear has no spiral angle hence the spiral hob must be inclined, more or less, to bring the cutters-in line with the tooth spaces to be cut. In order to **cut** correct teeth, the axis of the hob should be perpendicular to the axis of the gear blank. In such case the hob will generate involute teeth if its threads are cut to the same axial section as the straight-sided parent rack for the required pitch. Since the hob must be inclined to cut a spur gear, the teeth are not generated from the axial or rack section, but from a diagonal section. The axial pitch of a hob for cutting spur gears is not the same as the pitch of the gears, which it cuts. The normal pitch of the hob threads must be the same as the gear pitch.